AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
	1 / 43

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
069	See Block 16C	11EM000068	

6. ISSUED BY CODE 00601

Richland Operations Office
U.S. Department of Energy
Richland Operations Office
P.O. Box 550, MSIN A7-80
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Richland Operations Office
U.S. Department of Energy
Richland Operations Office
P.O. Box 550, MSIN A7-80
Richland WA 99352

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP Code)*

MISSION SUPPORT ALLIANCE, LLC
Attn: Mr. J. Frank Armijo
2490 Garlick Boulevard
RICHLAND WA 99354

CODE 800095031 FACILITY CODE

(x) 9A. AMENDMENT OF SOLICITATION NO.

9B. DATED *(SEE ITEM 11)*

x 10A. MODIFICATION OF CONTRACT/ORDER NO. DE-AC06-09RL14728

10B. DATED *(SEE ITEM 13)* 04/28/2009

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☐ is not extended.
Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*
Not applicable

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	
X	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. I.139 DEAR 970.5204-2 Laws, Regulations, and DOE Directives.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER *(Specify type of modification and authority)*

E. IMPORTANT: Contractor ☒ is not, ☐ is required to sign this document and return 0 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

This change order incorporates an update to Table J-2.8, Directives, Regulations, Policies, and Standards, to include CRD O 426.2 Personnel Selection, Training, Qualifications, and Certification Requirements for DOE Nuclear Facilities into the contract. Funds to be expended to implement this change order shall not exceed $20,000.00 from funds previously allotted to this contract in accordance with Clause B.3, Obligation and Availability of Funds, prior to the definitization of this change in accordance with the referenced clause.

The schedule for definitizing this modification is as follows:
Contractor submits technical, cost, and fee
Proposal - 40 days
Commence negotiations - 90 days
Continued ...

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*	
		Alan E. Hopko	
15B. CONTRACTOR/OFFEROR *(Signature of person authorized to sign)*	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA *(Signature of Contracting Officer)* Alan E. Hopko	16C. DATE SIGNED 10/12/10

NAME OF OFFEROR OR CONTRACTOR
MISSION SUPPORT ALLIANCE, LLC

ITEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
	Mutual agreement on definitization - 110 days Contractor submits certificate of current cost or pricing data - 120 days Execute definitization contract modification - 130 days *Date is specified as the number of calendar days after the contractor has authorization to proceed, which occurs after government execution of this modification. Period of Performance: 04/28/2009 to 04/28/2014				

CONTRACTOR REQUIREMENTS DOCUMENT
DOE O 426.2, *PERSONNEL SELECTION, QUALIFICATION, AND TRAINING REQUIREMENTS FOR DOE NUCLEAR FACILITIES*

Regardless of the performer of the work, the contractor is responsible for complying with the requirements of this CRD. The contractor is responsible for flowing down the requirements of this CRD to subcontractors at any tier to the extent necessary to ensure the contractor's compliance with the requirements.

Chapter I of this CRD establishes general training program requirements that are to be applied to all personnel who can impact the safety basis through their involvement in the operation, maintenance, and technical support of all Department of Energy Hazard Category 1, 2, and 3 nuclear facilities.

Chapter II of this CRD contains additional training requirements for positions unique to various types of nuclear facilities such as the specific training and certification requirements for reactor operators.

Chapters I and II apply to Hazard Category 1/Category A reactor facilities, Hazard Category 2/Category B reactor facilities, and Hazard Category 2 and 3 nonreactor nuclear facilities. The requirements in these chapters for nonreactor nuclear facilities are designed for Hazard Category 2 nuclear facilities. A graded approach must be used when applying the requirements of this CRD to Hazard Category 1, 2 and 3 nuclear facilities.

CHAPTER I. GENERAL REQUIREMENTS

1. TRAINING IMPLEMENTATION MATRIX.

The contractor must prepare a Training Implementation Matrix (TIM) to identify those sections of this CRD that are applicable to a particular facility. The TIM defines and describes the application of the selection, qualification, certification, and training requirements of this CRD. It must clearly define the organization, planning, and administration of the program and set forth the responsibility, authority, and methods for conducting training. Suitable justification must be included in the TIM for CRD provisions that are not implemented. At sites with several facilities, a combined TIM may be submitted.

Throughout this CRD, the word "must" is used to denote actions that are required to be performed if the objectives of CRD provisions are to be met. If provisions of this CRD become requirements through inclusion in the TIM (either explicitly or by reference) then the "must" statements would become contractually binding requirements.

Contractors with an approved TIM previously submitted in accordance with DOE O 5480.20A, dated 11-15-94, must submit either an addendum or page changes to the TIM to reflect the changes made as a result of the implementation of this CRD. If no changes are needed to reflect this revised CRD, a memorandum to that effect may be submitted as the addendum. Changes must be submitted to DOE for approval within 90 days from the date of inclusion of this CRD in the contract. For facilities that have met all the requirements of the TIM and have archived it and are using a training program description or plan (TPP) the contractor must submit a compliance matrix reflecting changes made as a result of the implementation of this CRD. The TPP is maintained current with the use of a compliance matrix which reflects the new requirements of the CRD.

With DOE approval as stated in DOE O 426.2 paragraph 4.b, contractors who have reached full implementation of this CRD may transition to a TPP that is used subsequent to implementation of the TIM with respect to the requirements of this CRD.

2. TRAINING ORGANIZATION.

The operating contractor must establish one or more organizations to be responsible for the training of all applicable personnel. This organization(s) must be held accountable for providing the support necessary to ensure that personnel are qualified to safely and effectively meet job requirements. The responsibilities, qualifications, and authority of training organization personnel must be documented, and managerial roles, responsibilities, authority, and accountability clearly defined.

3. PERSONNEL SELECTION.

a. Selection. The contractor must establish a process for selection and assignment of personnel. This process must include factors such as background, experience,

education, and medical examination (as applicable), and should be based on the ability of the person to meet job performance requirements. Selection of personnel may involve a selection test.

If an individual does not meet the experience requirements of this CRD and cannot satisfy the alternatives to experience provisions in paragraph 3.c of this chapter, individuals may be assigned to that position based on consideration of the collective experience and the strength and balance of the overall operating organization. In such cases documented justification must be provided to DOE for approval on a case-by-case basis.

b. Alternatives to Education. Educational requirements are described as either baccalaureate or associate degree, or high school diploma. In each case, the type of degree/diploma required is a function of the person's responsibilities. Persons who do not possess the formal educational requirements specified should not be automatically eliminated where other factors provide sufficient assurance of their abilities to fulfill the duties of a specific position. These factors must be evaluated on a case-by-case basis and approved and documented by the contractor. The alternatives to education described in this section do not apply to the Shift Technical Advisor (STA) position. The following may be considered in making the evaluation of an acceptable alternative to the educational requirements:

(1) General Education Development (GED) test for a high school diploma;

(2) Professional engineers license or successful completion of Engineer in Training (EIT) examination for a baccalaureate or associate degree requirement;

(3) When combined with experience, completion of technical portions of an engineering, engineering technology, or related science program may substitute for the baccalaureate or associate degree. Successful completion must be determined by a transcript or certification by an institution or program accredited by an accrediting organization recognized by the Council for Higher Education Accreditation (CHEA) or the United States Department of Education (USDOE). Completion of 80 semester credit hours may be substituted for the baccalaureate requirement and 43 semester credit hours for the associate degree (in technical subjects related to the position); and

(4) Related experience may substitute for education at the rate of six semester credit hours for each year of experience up to a maximum of 60 credit hours.

c. Alternatives to Experience. Experience in design, construction, and operational training may be considered applicable nuclear experience and must be evaluated on a case-by-case basis and approved and documented by the contractor.

(1) Where course work is related to job assignments, post-secondary education may be substituted. Formal education must not be allowed to substitute for more than 50 percent of the experience requirement unless otherwise stated in Chapter II.

(2) Job-related training in the position sought may qualify as equivalent to nuclear experience on a one-for-one basis for up to a maximum of two years.

4. INITIAL TRAINING.

a. Training Process. A training program must be established for operations, maintenance, and technical staff personnel utilizing the systematic approach to training process. The basic elements of a systematic approach to training include: a systematic analysis of the jobs to be performed; learning objectives derived from the analysis of the job that describe desired performance after training; training design, development, and implementation based on the learning objectives; evaluation of trainee mastery of the objectives during training; and evaluation and revision of the training based on the performance of trained personnel in the job setting.

DOE-HDBK-1078-94, *Training Program Handbook: A Systematic Approach to Training*, and DOE-HDBK-1074-95, *Alternative Systematic Approaches to Training,* should be used to implement a graded approach to the systematic approach to training process. Additional guidance documents for implementation of the systematic approach (e.g., analysis, learning objective development, developing examinations) can be found on the DOE Technical Standards web site http://www.standards.doe.gov/.

(1) The contractor must conduct periodic reviews, 4.a.(3), and facility or process change reviews, 4.a.(4), of the TIM or TPP to ensure that the document is applicable to current facility conditions and meets the requirements of this CRD.

(2) The training and qualification program must be developed using a graded approach based on the hazards involved and risk associated with the operation of the facility or activity. Accordingly, the level of detail and content of the training program, and associated documents or procedures, must reflect the personnel selection, training and qualification that are required at these facilities.

(3) Contractors must perform periodic systematic evaluations of training and qualification programs (not to exceed three years) in accordance with DOE-STD-1070-94 "*Guidelines for Evaluation of Nuclear Facility Training Programs*." The TIM or TPP must be included in these reviews to ensure the document reflects current facility conditions and meets the requirements of this CRD.

(4) The contractor's change control process must require changes to the facility, processes, Documented Safety Analysis, Technical Safety Requirements, procedures and regulations to be reviewed to determine whether the existing training and qualification programs are consistent with planned facility operations and/or process conditions. If training and qualification changes are necessary, the changes must be evaluated to determine if the TIM remains applicable to current facility conditions and meets the requirements of this CRD. If the TIM is no longer fully applicable to current facility conditions or no longer meets the requirements of this order, the contractor must update the TIM or TPP and obtain DOE approval.

(5) The concept of training personnel as a team, stressing team communications and interaction, must be used where job functions require team solutions and activities.

(6) Training programs must consist of a combination of classroom-type and on-the-job training, and include simulator and laboratory training as it applies to the position. Classroom-type training may include lectures, seminars, computer based training, and structured self-study activities.

(7) The contractor must ensure that personnel who are in the process of completing training on tasks and activities for which they are not fully qualified must work under the direct supervision of someone who is qualified, and must not independently make decisions or take action when that work could affect facility safety. Additionally, contractor management must not place personnel who are in training in such positions. However, they may independently perform specific tasks or job assignments for which they are qualified.

b. General Training.

(1) General Employee Training (GET). All persons employed either full- or part-time in DOE Hazard Category 1, 2, and 3 nuclear facilities must be trained commensurate with their job duties.

(a) GET programs must include training on the following areas as they relate to individual jobs:

1 General description of facilities;

2 Job related policies, procedures, and instructions;

3 Radiological health and safety program (Training program content must be in accordance with 10 CFR 835);

4 Facility emergency plans;

5 Industrial safety/hygiene program;

6 Fire protection program;

7 Security program;

8 Quality assurance program; and

9 Criticality safety (Training program content must be in accordance with ANSI/ANS 8.20 - 1991, *Criticality Safety Training*).

(b) Visitors, contracted personnel, and temporary personnel must be under continuous escort while at the facility unless they have been trained in appropriate areas from the above list to the extent necessary to ensure safe execution of their duties.

(c) For persons requiring long-term (e.g., more than 10 working days) access, understanding of the information provided by the GET program must be evaluated by administering a written examination (includes computer and web based training examinations). All hazard identification and safety signage on the written examination must be identical in appearance and language as it exists at the facility. The examination must cover areas selected for training and must be of sufficient difficulty to ensure the person has adequate knowledge to work independently at the facility. Persons who do not pass this examination must not be permitted access without a continuous escort.

(d) Changes in GET must be included in continuing training programs for all facility personnel. Periodic examinations must be administered on areas of the GET program that are included in the continuing training program.

(2) Probabilistic Risk Assessment (PRA) Training. At those nuclear facilities for which a PRA has been performed and is applicable, initial and continuing training programs for operations and technical staff personnel must include training on the principal results of the PRA. This training must address the following:

(a) The importance of facility systems in preventing damage or severe accidents;

(b) Locations of all significant amounts of radioactive and other hazardous materials, and measures to prevent its release; and

(c) The importance of maintaining operational limits and conditions, and the consequences of violating those limits.

(3) Technician and Maintenance Personnel Training.

(a) All technicians and maintenance personnel must be qualified to perform the tasks associated with their specialty, or work under the direct supervision of personnel qualified to perform the activity or task.

(b) Personnel who perform work on engineered safety features as identified in the facility Documented Safety Analysis must be trained on those system/components. Included in this category are systems having a direct impact on the safe operation of the facility. System training must, at a minimum, include the following elements:

1 Purpose of the system;

2 General description of the system including major components, relationship to other systems, and all safety implications associated with working on the system; and

3 Related industry and facility-specific experience.

(c) Training program content for radiological control technicians (RCT) must be in accordance with the requirements contained in 10 CFR 835, *Occupational Radiation Protection* and DOE-STD-1098-2008, *Radiological Control*. RCT training program elements (i.e., selection, training process, continuing training, qualification) must be in accordance with the requirements of this CRD.

(4) Technical Staff Training. Technical staff personnel are typically involved in surveillance, testing, analysis of facility data, planning modifications, program review, and technical problem resolution in their area of expertise (e.g., electrical, mechanical, instrumentation and control, chemistry, radiation protection, safety, quality assurance, facility engineering).

(a) The contractor must develop a list of specific technical staff positions that have a direct impact on employee, facility, environment or public safety.

(b) Entry-level technical staff personnel who provide technical support to the operating organization must be trained in the following facility specific subject areas as appropriate to the position, unless they provide official transcripts of coursework that adequately covers the topics:

1 Facility organization;

2 Facility fundamentals;

a Heat transfer, fluid flow, and thermodynamics

b Electrical science

c Nuclear physics

d Chemistry/chemistry controls

e Process controls

3 Facility systems, components, and operations;

4 Simulator training (for facilities that have a simulator);

5 Environment, Safety, and Health Orders;

6 Codes and standards overview;

7 Facility document system;

8 Documented Safety Analysis, Technical Safety Requirements, and safety basis documentation;

9 Nuclear criticality control;

10 Material, maintenance, and modification control;

11 ALARA and radwaste reduction program; and

12 Quality Assurance/Quality Control practices.

(5) Management and Supervisory Training. The topics listed in paragraph 4.b.(4)(b) must be considered for applicability when developing manager and supervisor training programs. If training related to those topics is applicable to the position, that training must be included in addition to the topics listed below. Supervisory skills and management training need not be subject to examination as part of initial training, nor is it necessary to include training on these topics in the continuing training program. It may, however, be appropriate to include additional topics such as these as part of the ongoing professional development program for managers and supervisors.

(a) Supervisory Skills Training. The supervisory skills training program must include the following (or equivalent):

1 Leadership;

2 Interpersonal communication;

3 Roles, responsibilities, authority, and accountability;

4 Motivation of personnel;

5 Problem analysis and decision making;

6 Fitness for duty procedures;

7 Administrative policies and procedures;

8 Conduct of operations;

9 Conduct of maintenance;

10 Conduct of selection, training, qualification and certification of personnel;

11 Work control process; and

12 Management of personnel performance issues and performance appraisals.

(b) Management Training. The management training program must include:

1 Supervisory skills training;

2 Quality assurance and quality control;

3 Facility security and emergency plans;

4 Purchasing;

5 Material storage;

6 Facility modifications (configuration control);

7 Nuclear, industrial, and radiation safety;

8 Environmental issues; and

9 Budgeting.

c. Exceptions to Training. The initial training programs described in this CRD are developed for persons assumed to have the entry-level knowledge and skills required of the position for which they are to fill. Some candidates may already possess the knowledge and skills necessary for certain aspects of their job

requirements that may be deemed equivalent to certain areas of training programs on the basis of prior education, experience, training, and/or testing. Testing (i.e., performance demonstrations, written examinations, oral examinations, or evaluation of work products) is the preferred method for determining such exceptions. In all cases, the requisite qualification examinations to establish qualification/certification must be completed.

(1) The operating contractor must establish an administrative procedure that describes the methods used to administer and document exceptions to initial training program requirements. When an individual seeks an exception, the name of the person, the specific subject for which the exception is requested and the justification for the exception must be included as part of the documentation. In all cases, the operating organization must ensure that sufficient facility-specific instruction is provided to enable the candidate to perform job requirements. The operating organization must submit the procedure for granting exceptions to the Heads of Field Organizations/Field Element Manager for NNSA Operations for approval.

(2) Personnel placed in the training program that have satisfactorily completed equivalent training programs comparable in content and performance standards may be released from portions of training on an individual case basis. Exceptions from training should be based on a review of previous training records (i.e., transcripts), personal interviews, and on examinations that are based on the objectives stated for the training program.

(3) Exceptions to training requirements may be approved by contractor management after approval of the exception procedure by the DOE Heads of Field Organizations/NNSA Field Element Manager.

(4) Persons who believe that they have comparable knowledge or skills may challenge the requirement to attend training. Challenge examinations (written or performance) may be administered. These examinations must be sufficiently comprehensive to adequately test the learning objectives stated in the training. The use of challenge tests is not considered an exception to the training and as such, challenge tests are excluded from the requirements for exceptions in the preceding portions of this section. Accordingly, they do not need to be approved on a case-by-case basis.

5. QUALIFICATION PROCESS.

Qualification is defined in terms of education, experience, training, examination, and any special requirements necessary for performance of assigned responsibilities. The requirements in this CRD are intended to provide reasonable assurance that personnel at DOE Hazard Category 1, 2, and 3 nuclear facilities possess qualifications to operate and maintain the facility safely and reliably under all conditions.

a. General. The program leading to qualification must be governed by written procedures that include requirements for documented assessment of the person's qualifications through examinations and performance demonstrations. The contractor must define qualification requirements for personnel in each functional level or area based on the criteria contained in this CRD. The contractor must have a method for formally indicating that a person is qualified and when the qualifications expire.

(1) Qualification may be granted only after assuring that all requirements (including training and examinations) and other specified requirements (e.g., medical examination) have been satisfactorily completed.

(2) Qualification of operators and their immediate supervisors is valid for a period not to exceed two years unless revoked for cause (e.g., medical disqualification, performance deficiencies).

b. Subcontractor Personnel. Subcontractor personnel must meet the qualification requirements for the job function to be performed. In addition, the operating contractor must ensure that subcontractor and temporary personnel who perform specialized activities (e.g., radiation protection, maintenance, in-service inspection, radiography, and welding) are qualified to perform their assigned tasks. Personnel must be considered adequately qualified with proper documentation based on at least one of the following:

(1) The satisfactory result of an audit of subcontractor records which relate to qualification of the subcontractor personnel being considered for assignment by the operating organization, or;

(2) The operating contractor's previous verification (within 2 years) of the ability of the subcontractor employee to perform assigned tasks safely and efficiently, or;

(3) Successful completion by the subcontractor employee of those segments of the operating organization's qualification program which are considered pertinent to accomplishment of the task to be performed.

For subcontractor personnel who do not meet the requirements, work activities on engineered safety features as identified in the facility Documented Safety Analysis must be supervised by a person who meets the qualification criteria established by the operating organization for conduct of the activities.

c. Managers and Technical Staff. Even though applied broadly to personnel in the operating organization, the term qualification has a different application for managers and technical staff personnel. These personnel may be considered qualified by virtue of meeting the education and experience requirements associated with the position and by completing applicable position-specific training. A comprehensive examination need not be administered to determine their qualification. Continuing training and professional development programs

should be established to meet the needs of the individual and the position. Satisfactory performance of their assigned duties and assessment of individual performance such as that which is typically included in personal performance appraisals may be used to document continued satisfactory performance.

d. Technicians and Maintenance Personnel. Technician and maintenance personnel qualification must include demonstrated performance capabilities (performance demonstrations) to ascertain their ability to adequately perform assigned tasks. Written examinations should be administered to personnel in these positions as applicable. However, a comprehensive final examination need not be administered to ascertain formal qualification of technicians and maintenance personnel (with the exclusion of radiological control technicians, who must comply with the requirements of 10 CFR 835). Satisfactory completion of the continuing training program, performance of their assigned duties, and assessment of individual performance such as that which is typically included in personal performance appraisals may be used to document continued satisfactory performance.

e. Operators and Supervisors. Qualification of operators and their immediate supervisors must include examinations (written, oral, operational evaluations, performance demonstrations) as applicable to the position.

(1) Written examinations and performance demonstrations must be administered to qualified operators and supervisors.

(2) Written and oral examinations and operational evaluations must be administered to certified operators and supervisors.

(3) Initial qualification/certification for a position must include a comprehensive written examination to ascertain the person's suitability to perform assigned duties.

f. Examinations.

(1) Written procedures that establish requirements for examinations must be developed and implemented. These procedures must address, at a minimum, examination/evaluation development, approval, security, administration, remediation, and maintenance of examination question banks.

(2) Examinations must contain a representative sampling of the knowledge and skills identified in and derived from the learning objectives resulting from the systematic analysis of the position.

(3) Examinations must include questions from sources such as Documented Safety Analysis, Technical Safety Requirements, system description

manuals, operating procedures, Occurrence Reports, and other sources, as applicable.

(4) The oral examination leading to certification must be separate from the operational evaluation for Hazard Category 1 nuclear facilities (Category A reactors).

(5) Operational evaluations and oral examinations leading to certification may be combined for Hazard Category 2 and 3 nuclear facilities (Category B reactors and non-reactor nuclear facilities).

(6) Oral examinations may be conducted as a one-on-one walkthrough or by an oral board or committee consisting of personnel identified by contractor facility management. The oral examination content must be tailored to evaluate the candidate's operational knowledge (initial/continuing training program subjects) and organizational awareness (e.g., operating philosophy, use of procedures, shift and relief turnovers, verification of system/equipment status) to determine how the individual will function in an operating environment.

6. CERTIFICATION PROCESS.

Certification is the process by which contractor management endorses and documents, in writing, the satisfactory achievement of qualification of a person for a position. Certification follows the completion of the qualification program for those positions identified as requiring certification. The notable difference between certification and qualification is that certification requires official contractor management endorsement of an individual's qualification to ensure senior management involvement in the qualification of key operations positions (i.e., operators and supervisors). Other significant differences between qualification and certification are the requirements associated with continuing training, examination, and reexamination for recertification.

a. Reactor operators, senior reactor operators, fissionable material handlers, and fissionable material handler supervisors at Hazard Category 1, 2, and 3 nuclear facilities must be certified. For all other operators and their immediate supervisors, the contractor must identify in the TIM or TPP any additional positions that will be certified based on facility hazards and operational complexity (e.g., tritium facility operators, enrichment facility operators, tank farm operators, and their immediate supervisors).

b. The program leading to certification must be governed by written procedures that include requirements for documented assessment of the person's qualifications through examinations and operational evaluations.

c. Certification must not be granted until all qualification requirements (including written and oral examinations and operational evaluations) and other specified requirements (e.g., medical examination) have been satisfactorily completed, and

management has assured that the person is capable of safely performing all functions of the position. Satisfactory completion of qualifications which result in certification must be verified by a person or group other than the candidate's immediate supervisor or the person/group that provided the training. Certification must be valid for a period not to exceed two years unless revoked for cause (e.g., medical disqualification, performance deficiencies, or failure to maintain proficiency).

7. CONTINUING TRAINING.

Continuing training programs must be established to maintain and enhance the knowledge and skills of operating contractor personnel who perform functions associated with engineered safety features as identified in the facility Documented Safety Analysis (includes operations, maintenance, and technical support personnel). The guidance in DOE-HDBK-1118-99, *Guide to Good Practices for Continuing Training*, should be used to develop continuing training programs.

a. General.

(1) Continuing training programs must be structured commensurate with specific position needs, and must be administered on a cycle not to exceed two years.

(2) Continuing training must include, at a minimum, training in significant facility system and component changes, applicable procedure changes, applicable industry operating experience, selected fundamentals with emphasis on seldom used knowledge and skills necessary to assure safety, and other training as needed to correct identified performance problems.

(3) Periodic examinations (written, oral, operational evaluations, performance demonstrations, as applicable to the position) must be administered and documented throughout the cycle on material included in the program.

b. Certified Operators and Supervisors. Continuing training programs for certified operators and supervisors must consist of preplanned classroom-type training, on-the-job training, and operational evaluations on a regular and continuing basis. Continuing training must include, at a minimum, the following as related to job performance:

(1) Training and examination covering abnormal facility procedures and emergencies must be provided at least annually;

(2) Operational drills conducted in the facility or on a simulator must be provided at least biennially. (Facility evacuation drills are not considered operational drills.) Training drills conducted in the facility must not lead to or have the potential for safety concerns;

(3) Instruction in the use of facility systems to control or mitigate accidents. Such training must include both classroom-type training and training conducted in the facility;

(4) Personnel who are responsible for developing and delivering training may be excused from continuing training for the area of primary administrative responsibility; and

(5) Training, as applicable to the position, in the following subjects where examinations and experience (industry and facility-specific) or other evidence indicates additional emphasis in scope and depth of coverage is needed:

(a) Theory and principles of facility operation;

(b) General and specific facility operating characteristics;

(c) Facility instrumentation and control;

(d) Facility protection systems;

(e) Engineered Safety Features;

(f) Normal, abnormal, and emergency procedures;

(g) Radiation control and safety; and

(h) Documented Safety Analysis and Technical Safety Requirements.

8. REQUALIFICATION.

Personnel (including operations, maintenance, and technical support personnel) may be requalified by contractor management upon completion of the continuing training program, including requisite examinations (written, oral, and operational/performance). Personnel and their immediate supervisors must not be allowed to continue to function in qualified or certified positions if they have not completed all of the requalification or recertification program elements within the two year continuing training cycle. The contractor must indicate by signature that the person has successfully completed the requalification program and is formally requalified.

a. Requalification Examinations. Requalification must include requisite examinations. This may be achieved by either administering a comprehensive biennial requalification examination, including any operational evaluations or performance demonstrations that may be specified, or by administering periodic examinations (e.g., quarterly) during the requalification cycle.

(1) Requalification Examinations for certified and qualified operators and supervisors must include subjects in which the person is expected to be

knowledgeable and emphasize those subjects covered by the continuing training program.

(2) Written examinations and performance demonstrations must be administered to qualified operators and supervisors.

(3) Written and oral examinations and operational evaluations must be administered to certified operators and supervisors.

(4) The oral examination must be separate from the operational evaluation for Hazard Category 1 (Category A reactor) nuclear facility certified personnel.

(5) Operational evaluations and oral examinations may be combined for Hazard Category 2 and 3 (Category B reactor and non-reactor) nuclear facility certified personnel.

(6) Operational evaluations must require certified operators and certified supervisors to demonstrate an understanding of and the ability to perform a representative sampling of the control manipulations applicable to the position and the facility.

(7) If a requalification or recertification examination is failed, or personnel show serious job performance deficiencies which indicate that he or she may perform in an unsafe manner, or if any required training element lapses, the person must be removed from activities for each qualification or certification area that requires the lapsed element.

Qualification or certification may be regained after completing remedial training designed to correct the deficiency(s) and satisfactorily completing a reexamination or completion of the lapsed training requirement. In addition, recertification must be based on the following:

(a) A review of individual operating performance during the past certification period by either line management, by a committee, or by a person designated by management; and

(b) A current medical examination.

b. Absences.

(1) When a qualified or certified individual has been absent from duties for greater than 3 months, but less than 12 months, selected retraining (including written and oral examinations and operational/performance evaluations, as deemed necessary) must be given prior to reassignment to duties. The qualification or certification base date remains the same as it was before the absence.

(2) When a qualified or certified individual has been absent for greater than 12 months, comprehensive written and oral examinations and operational/performance evaluations (as required of initial candidates) must be given to determine weak areas. Retraining and reexamination must be required in areas of weakness, and upon successful completion, a new qualification or certification date may be established.

c. Extensions. An extension of qualification or certification may be granted to persons on a case-by-case basis in order to support operational and mission commitments.

(1) The operating contractor must establish an administrative procedure for granting extensions to qualification or certification. At a minimum, the documentation to support the extension must include:

(a) Responsibility for approval of the extension;

(b) Length of the extension; and

(c) Explanation of the circumstances that prevented the person from completing the requirements.

(2) Extensions of certification of operators and supervisors must be approved by the DOE Heads of Field Organizations/NNSA Field Element Manager. Extensions of qualification of operators and supervisors may be approved by contractor facility management.

9. MEDICAL EXAMINATIONS.

An initial medical examination must be given to certified operator and certified supervisor candidates to verify health and physical fitness to safely perform their assigned tasks. A reexamination must be given to certified operators and certified supervisors at least every two years. Certified operators and certified supervisors must also be cleared by medical examination prior to returning to work following any illness or injury which keeps the person from performing their duties for a period exceeding one month. Medical examination requirements for other operating contractor personnel must be in accordance with operating contractor procedures.

a. Medical examination requirements for Hazard Category 1/Category A reactors must be in accordance with ANSI/ANS 3.4-1996, *Medical Evaluation of Licensed Personnel at Nuclear Power Plants*, and NRC Regulatory Guide 1.134, Rev. 3, of 3-98, *Medical Evaluation of Licensed Personnel at Nuclear Power Plants*.

b. Medical examination requirements for Hazard Category 2/Category B reactors must be in accordance with ANSI/ANS 15.4-2007, *Selection and Training of Personnel for Research Reactors*.

10. RECORDS.

Contractors must develop and implement administrative procedures that specify requirements for the maintenance of training, qualification, and certification records. Guidance in Nuclear Information and Records Management Association (NIRMA) TG-17, *Guidelines for Management of Nuclear Related Training Records*, TG-15, *Management of Electronic Records, and TG-21, Electronic Records Protection and Restoration*, should be used to help standardize identification, handling, and storage of training records.

Qualification and certification of personnel must be documented in an easily auditable format. Individual record documentation must include the following at a minimum:

NOTE: Some documents may be sensitive or classified due to their content (e.g. medical or personally identifiable information) and therefore must be protected in secured locations other than training record files. In such cases, the TIM or TPP should indicate the location where the secured information can be found. Additionally, controlling access to training records is required to maintain examination security.

a. Education, experience, and employment history and most recent health evaluation summary;

b. Training programs completed and qualification/certification achieved;

c. Latest completed checklists, graded written examinations (with answers corrected as necessary or examination keys), simulator examinations (where applicable), and operational evaluations used for certification. The record should include an evaluation of knowledge and performance during operational evaluations;

d. Lists of questions asked and the examiner's overall evaluation of the responses on oral examinations.;

   (1) Correspondence relating to exceptions to training requirements and extensions of qualification/certification;

   (2) Records of qualification for one-time-only special tests or operations; and

   (3) Attendance records for required training courses or sessions.

e. A historical record that documents initial qualification or certification, and applicable information from the above list that verifies the most recent qualification or certification must be retained in individual records, either hard copy or electronically. Superseded information should be handled in accordance with current DOE records disposition requirements.

CHAPTER II. HAZARD CATEGORY 1, 2, AND 3 NUCLEAR FACILITY PERSONNEL

1. PURPOSE.

This Chapter contains additional, specific training requirements for positions unique to various types of nuclear facilities such as the specialized training and certification requirements for reactor operators. These requirements are in addition to the general requirements of Chapter I.

2. EDUCATION AND EXPERIENCE REQUIREMENTS.

Education and experience requirements for operating organization personnel are intended to provide reasonable assurance that these personnel have, or can acquire, the knowledge and skills to operate and maintain nuclear facilities and related support systems in a safe and reliable manner under all conditions. Persons at the manager level must meet the requirements shown on Tables 1, 2 and 3 below prior to assuming the duties of the assigned positions in the tables. These tables (and supporting notes) identify the minimum education and experience requirements for operating organization positions. Except when noted otherwise, BS and AS degrees are in engineering or a related science.

Table 1 - Hazard Category 2 and 3 Nonreactor Nuclear Facility Personnel Education and Experience Requirements

	EDUCATION	EXPERIENCE	
	Degree or Diploma	Job Related	Nuclear
Managers	BS *(1)*	*(8)*	4 Yr *(2)*
Operations Management	BS	3 Yr*(8)*	2 Yr
Supervisors	HS		3 Yr *(3)*
Operators	HS		
Technicians		1 Yr	
Maintenance Personnel		1 Yr	
Technical Support Personnel	BS	2 Yr	1 Yr
Instructional Analyst/Developer	BA*(4)*	1 Yr	
Training Instructors	HS	*(5)*	*(6,7)*

Table 1 Notes:

(1) *The training manager must have a baccalaureate degree. The training manager must have courses in education or training that focus on instructional analysis, design, development, delivery and testing as well as evaluation of training programs if not included in the baccalaureate course material (baccalaureate need not be in engineering or related science).*

(2) *Education or experience that is job related may be substituted on a case-by-case basis. The degree may fulfill 3 of the 4 years of nuclear experience on a one-for-one time basis.*

(3) *Full-time related academic training (e.g., degree programs, trade schools, vocational programs, etc.) may be substituted on a one-for-one basis for 2 of the 3 years nuclear experience.*

(4) *Instructional Analysts/Developers should have a baccalaureate degree in Training or Education. The Instructional Analyst/Developer must have courses in education or training that focus on instructional analysis, design, development, delivery and testing, as well as evaluation of training programs, if not*

included in the baccalaureate course material.

(5) *Experience consistent with the material being presented.*

(6) *Instructors who are responsible for instruction on subjects such as Technical Safety Requirements must have successfully completed training on facility operating characteristics and principles, and operating limits (Safety Limits, Limiting Control Settings, and Limiting Conditions for Operation) and their bases or have had significant involvement in writing the TSRs.*

(7) *Instructors must have demonstrated knowledge of instructional techniques through basic instructor or equivalent training or experience approved by the training manager. Instructors must have knowledge and/or expertise for the material being presented.*

(8) *Managers must receive facility-specific training based upon a comparison of the individual's background and abilities with the responsibilities and duties of the position.*

Table 2 - Hazard Category 1/Category A Reactor Facility Personnel Education and Experience Requirements

	EDUCATION		EXPERIENCE		SPECIAL REQMTS
	Degree or Diploma	Other	Job Related	Nuclear	RO/SRO Cert
Managers					
Plant/Facility Manager	BS		*(1)*	6 Yr *(2, 3)*	SRO*(5)*
Operations Manager	BS		*(15)*	4 Yr *(3)(6)*	SRO*(13)*
Maintenance	BS	(8)	*(15)*	4 Yr *(3)(6)*	
Technical Manager	BS		*(15)*	4 Yr *(3)(7)*	
Supervisors					
Shift Supervisor	HS			4 Yr *(6)*	SRO
Senior Reactor Operator	HS		4 Yr	2 Yr *(3)*	SRO*(10)*
Qualified Supervisor	HS		4 Yr	1 Yr *(4)*	
Technical Support					
Reactor Engineering	BS		4 Yr*(16)*	2 Yr *(3)(19)*	
Instrumentation and Control	AS		4 Yr*(16)*	2 Yr (3)	
Chemistry/Radiochemistry	BS*(22)*		4 Yr*(16,24)*	2 Yr *(3)*	
Radiation Protection	BS	*(23)*	4 Yr*(16)*	3 Yr *(3)*	
Preoperational Testing Engineer	BS			2 Yr *(7)*	*(20)*
Startup Testing Engineer	BS			2 Yr *(7)*	*(20)*
Shift Technical Advisor	BS			1 Yr *(3)*	*(21)*
Training Organization					
Training Manager	BS/BA*(17)*		4 Yr*(16)*	2 Yr	SRO*(9)*
Instructional Analyst/Developer	BA*(14)*		2 Yr	*(3)*	
Training Instructor	HS		2 Yr*(11)*		*(12)*

	EDUCATION		EXPERIENCE		SPECIAL REQMTS
	Degree or Diploma	Other	Job Related	Nuclear	RO/SRO Cert
Operators, Technicians, and Maintenance					
Auxiliary Operator	HS			1 Yr *(7,3)*	
Reactor Operator	HS			3 Yr *(3,6,18)*	RO
Technician	HS		3 Yr		
Maintenance Personnel	Journeyman		3 Yr		

Table 2 Notes:

(1) Minimum of 4 years of supervisory or management experience.

(2) Three years of nuclear experience may be power plant experience.

(3) Minimum of 6 months onsite.

(4) Minimum of 3 months onsite.

(5) Hold, or have held, a senior reactor operator certification for similar Hazard Category 1/Category A reactor plant (or equivalent) or have been certified at an appropriate simulator. Plant managers who have an assistant holding an SRO certification need not meet this special standard.

(6) Two years of nuclear experience may be nuclear/non-nuclear power plant experience.

(7) One year of nuclear experience may be power plant experience.

(8) Must be familiar with nondestructive testing and have an understanding of electrical, pressure vessel, and piping codes and standards.

(9) If the training manager does not hold, or has not held, a senior reactor operator certification, another person who holds a senior reactor operator certification must be responsible to the training manager for the content and conduct of training for certified operators.

(10) If the candidate for senior reactor operator (SRO) does not possess a baccalaureate in engineering or equivalent, he or she must have 1 year of experience as a certified reactor operator at the reactor for which certification is sought. Candidates for SRO with a baccalaureate in engineering or equivalent must participate in reactor plant operations at power levels of at least 20 percent for at least six weeks and perform all control manipulations that a reactor operator candidate would perform.

(11) Experience must be consistent with the material being presented. Instructors must have demonstrated knowledge of instructional techniques through training or experience and be qualified by the training manager (or equivalent) for the material being presented.

(12) Instructors who provide instruction on the reactor plant simulator to certified personnel must hold, or have held, a senior reactor operator certification for a similar Hazard Category 1/Category A reactor plant (or equivalent), or have been certified on the reactor plant simulator. Persons who are responsible for instruction of subjects such as Technical Safety Requirements, reactor operating principles and characteristics, and control manipulations must have received senior reactor operator (or equivalent) training.

(13) The operations manager must hold a senior reactor operator certification at the time of appointment to the position.

(14) Instructional Analysts/Developers should have a baccalaureate degree in Training or Education. The Instructional Analyst/Developer must have courses in education or training that focus on instructional analysis, design, development, delivery and testing, as well as evaluation of training programs, if not included in the baccalaureate course material.

(15) Minimum of 3 years of supervisory or management experience.

(16) Minimum of 1 year of supervisory or management experience.

(17)	*The training manager must have a baccalaureate degree. The training manager must have courses in education or training that focus on instructional analysis, design, development, delivery and testing as well as evaluation of training programs if not included in the baccalaureate course material (baccalaureate need not be in engineering or related science).*
(18)	*Six months of the required experience must be experience as a qualified auxiliary operator at the reactor for which certification is sought.*
(19)	*Nuclear experience must be in areas such as reactor physics, core measurements, core heat transfer, and core physics testing programs.*
(20)	*Must be knowledgeable of test program administration, design and operational performance requirements of the systems and equipment being tested, interaction between systems, and expected plant operational characteristics during the test.*
(21)	*This person must be knowledgeable of control room instruments and controls.*
(22)	*Baccalaureate degree must be in chemistry or related science.*
(23)	*Must include formal training in radiation protection.*
(24)	*At least one year of experience must be in radiochemistry.*

Table 3 - Hazard Category 2/Category B Reactor Facility Personnel Education and Experience Requirements

	EDUCATION	EXPERIENCE		SPECIAL REQMTS
	Degree or Diploma	Job Related	Nuclear	RO/SRO Cert
Managers	BS *(1)*	*(8)*	6 Yr *(2,3)*	
Supervisors	HS		3 Yr *(3,9)*	SRO
Senior Reactor Operator	HS		3 Yr *(3)*	SRO
Reactor Operator	HS			RO
Technician		1 Yr		
Maintenance Personnel		1 Yr		
Technical Support Personnel	BS	2 Yr	1 Yr	
Instructional Analyst/Developer	BA *(4)*	2 Yr		
Training Instructor	HS	*(5)*		*(6,7)*

Table 3. Notes:

(1)	*The training manager must have a baccalaureate degree. The training manager must have courses in education or training that focus on instructional analysis, design, development, delivery and testing as well as evaluation of training programs if not included in the baccalaureate course material (baccalaureate need not be in engineering or related science).*
(2)	*Education or experience that is job related may be substituted on a case-by-case basis. The degree may fulfill 4 of the 6 years of nuclear experience on a one-for-one time basis.*
(3)	*Experience acquired at nuclear power, test, research, or production reactors or a critical facility counts on a one-for-one time basis.*
(4)	*Instructional Analysts/Developers should have a baccalaureate degree in Training or Education. The Instructional Analyst/Developer must have courses in education or training that focus on instructional analysis, design, development, delivery and testing, as well as evaluation of training programs, if not included in the baccalaureate course material.*
(5)	*Experience consistent with the material being presented.*
(6)	*Instructors who are responsible for instruction of subjects such as Technical Safety Requirements, reactor operating principles and characteristics, and control manipulations must have received senior reactor*

	operator (or equivalent) training.
(7)	*Instructors must have demonstrated knowledge of instructional techniques through training or experience and be qualified by the training manager (or equivalent) for the material being presented.*
(8)	*Managers must receive some facility specific training based upon a comparison of the individual's background and abilities within the responsibilities and duties of the position.*
(9)	*Full time academic training may be substituted on a one for one basis for 2 of the 3 years of required nuclear experience.*

3. CONTROL MANIPULATION REQUIREMENTS FOR CERTIFIED POSITIONS.

a. The operating contractor must prepare a list of control manipulations for certified positions (Chapter I, section 6.a.) in reactor and non-reactor nuclear facilities.

(1) Control manipulation lists must be based on an analysis of the job.

(2) Candidates for certification must perform control manipulations for initial certification and on a biennial basis as part of the continuing training program after certification is achieved.

(3) Certified supervisors need only supervise or direct the performance of control manipulations to satisfy this requirement. However, there may also be situations in which the nuclear facility could require that a certified supervisor actually perform the control manipulation as part of initial certification if the operation requires in-depth knowledge to ensure that the operation is performed safely and correctly.

b. The following are additional requirements for Hazard Category 1/Category A and Hazard Category 2/ Category B reactors.

(1) The list of control manipulations must specify which manipulations are to be performed annually and which are to be performed biennially by reactor operators and senior reactor operators.

(2) Reactor operator and senior reactor operator candidates must perform a minimum of five significant reactivity manipulations (e.g., reactor startup, reactor shutdown, >10% change in reactor power) for initial certification. Additional control manipulations should be based on the analysis.

4. OPERATIONAL EVALUATION REQUIREMENTS.

The operational evaluations administered to certified operator, reactor operator, senior reactor operator, fissionable material handler, and certified supervisor candidates must be generally similar in scope. To accommodate specialized modes of operation and differences in control, equipment and operator knowledge and skill requirements, operational evaluations for Hazard Category 2/Category B reactor personnel must be similar, but need not be identical to the operational evaluations for Hazard Category 1/Category A reactor personnel. Significant deviations from the operational evaluations

required of Hazard Category 1/Category A reactor personnel must be justified in writing and included in the TIM or TPP.

The evaluation must contain questions and operational exercises and must include a facility walkthrough, and may include system and/or component operation. Operational evaluations, to the extent applicable to the facility, must require the candidate to demonstrate an understanding of, and the ability to perform the actions necessary to accomplish a representative sampling from the following items:

a. Perform pre-startup procedures, including operating of controls associated with equipment which could affect reactivity or criticality safety;

b. Manipulate controls as required to control the facility between shutdown and normal operation;

c. Identify annunciators and condition-indicating signals and perform appropriate remedial actions;

d. Identify instrumentation systems and the significance of associated instrument readings;

e. Observe and safely control the operating behavior characteristics of the facility;

f. Perform control manipulations to obtain desired operating results during normal, abnormal, and emergency situations;

g. Safely operate heat removal systems and explain relationships between proper operation of these systems to the operation of the facility;

h. Safely operate auxiliary and emergency systems, including controls of facility equipment that could affect criticality safety or release of radioactive or hazardous material to the environment;

i. Demonstrate or describe the use and function of radiation monitoring systems, including fixed radiation monitors and alarms, portable survey instruments, and personnel monitoring systems;

j. Demonstrate knowledge of significant radiation hazards, including permissible levels in excess of those authorized and ability to perform other procedures to reduce excessive radiation levels and to guard against personnel exposure;

k. Demonstrate knowledge of the emergency plan, including, as appropriate, certified operator or supervisor responsibility to decide whether the plan should be executed and assign duties under the plan;

l. Demonstrate knowledge and ability, as appropriate to the assigned position, to assume the responsibilities associated with safe operation; and

m. Demonstrate the ability to function within the facility or the control room as a team, as applicable to the facility and to the position, in such a way that procedures are adhered to and Technical Safety Requirements are not violated.

5. CERTIFIED OPERATOR, FISSIONABLE MATERIALS HANDLER, AND SUPERVISOR PROFICIENCY REQUIREMENTS.

Certified operators, fissionable materials handlers and supervisors must actively perform job functions associated with their certification to maintain proficiency. Actively performing job functions associated with certification means that the certified individual has a position on the shift crew, and that the individual carries out and is responsible for the day-to-day duties of the certified position. If certified operators, fissionable materials handlers or supervisors are absent from activities associated with the certified position for extended periods of time, their ability and readiness to perform at a high level of vigilance can reasonably be expected to decrease.

a. General. If active status is not maintained, certification must be suspended and the person must not be assigned certification duties. Prior to resuming duties associated with certification, the operating contractor must ensure that:

(1) Certification is otherwise current and valid; and

(2) The individual has performed certification duties under the direct supervision of a person certified in that position for a minimum period of time as stated below and must include a complete tour of the facility and all required shift turnover procedures.

(a) Non-reactor nuclear facilities must establish the minimum time (e.g., 6 hours) to reestablish proficiency.

(b) Hazard Category 1/Category A reactor certified reactor operators and senior reactor operators must perform a minimum period of 24 hours.

(c) Hazard Category 2/Category B reactor certified reactor operators and senior reactor operators must perform a minimum of 6 hours.

b. Maintenance of Proficiency. The proficiency requirement is imposed to ensure that certified personnel continue to possess and practice the skills and abilities necessary to operate the systems and equipment for which they are responsible in a safe and reliable manner during both normal and abnormal facility operations and system transients.

(1) General. If the facility is not operated frequently enough to meet established requirements, the operating contractor must ensure that certification is reinstated prior to operation. Administering written and oral

examinations and operational evaluations and conducting facility walkthroughs and/or simulated operations should be considered to ensure adequate operational knowledge (as determined by the duration of the inactivity or shutdown).

(2) Non-reactor Nuclear Facilities. The operating organization must establish procedures which define requirements and frequency (e.g., 8 hours per month) necessary to maintain an active status.

(3) Hazard Category 1/Category A Reactors. To maintain active status (proficiency), reactor operators and senior reactor operators must perform certification duties on a minimum of 36 hours per quarter in blocks of time no less than four hours.

(4) Hazard Category 2/Category B Reactors. To maintain active status (proficiency), reactor operators and senior reactor operators must perform certification duties for at least 4 hours per calendar quarter.

6. NON-REACTOR NUCLEAR FACILITY SPECIFIC REQUIREMENTS.

This section provides specific training requirements for operators, fissionable material handlers, and supervisors.

a. Operators. Operator training must be sufficiently comprehensive to cover areas which are fundamental to the candidate's assigned tasks to ensure that personnel are capable of safely performing their job duties. The training program must include the following:

(1) A core of subjects such as industrial safety, instrumentation and control, basic physics, chemistry, industry operating experience, and major facility systems, as applicable to the position and the facility.

(2) On-the-job and classroom-type training to ensure that personnel are familiar with all aspects of their positions. Such training must include but not be limited to:

(a) Normal and emergency procedures;

(b) Administrative procedures;

(c) Radiation control practices;

(d) Location and functions of pertinent safety systems and equipment;

(e) Procedures for making changes or alterations in operations and operating procedures; and

(f) Technical Safety Requirements.

b. Fissionable Material Handlers. Fissionable material handler candidates must be trained in the following subject areas in addition to that required in paragraph 6a above to the extent applicable to the position:

(1) Instrumentation and control, including types of instruments and control systems, principles of operation, and consequences of malfunctions;

(2) Facility operating characteristics, including principal features, operating parameters, and operating limits of the facility (to include auxiliary systems); and

(3) Principles of nuclear facility operation, including the processes involved and technical terminology for the chemical, physical, and metallurgical reactions and criticality safety principles, controls, and specifications.

c. Supervisors. The supervisor training program must include the subject categories and on-the-job training specified for operators and fissionable material handlers to the extent to which they are applicable. This training must be of increased depth to reflect the added responsibility of the supervisor position.

d. Operations Management Personnel. Operations management personnel must be qualified.

(1) Training must be satisfactorily completed on applicable facility/process safety basis documents.

(2) Training must be provided on process knowledge to demonstrate operational knowledge of applicable facilities/processes.

e. Certified Operator Written Examination Contents. Written examinations must be administered to certified operator candidates (fissionable material handlers and other positions that have been designated as certified, e.g., tritium facility operators, chemical process operators, waste tank operators, and enrichment facility operators). These examinations must contain a representative selection of questions on the knowledge and skills identified from learning objectives developed from the analysis of the job and from information in Documented Safety Analysis, Technical Safety Requirements, system description manuals and operating procedures, lessons learned from Occurrence Reports, and other applicable sources. The examination must include a representative sampling from the following items, in addition to the items listed in paragraph 6.a, as appropriate to the position and to the facility:

(1) Facility control and safety systems, including design, principles of operation, components, functions, instrumentation, signals, interlocks, failure modes, and automatic and manual features;

(2) Nuclear facility operating characteristics, and reasons for these operating characteristics, including causes and effects of temperature and pressure changes, and operating limitations;

(3) Principles of facility operation, including the process involved and technical terminology for the chemical, physical, and metallurgical reactions;

(4) Emergency systems, including components, functions, and limitations;

(5) Criticality safety principles, controls, and specifications;

(6) Radiation monitoring systems, including purpose, operation, alarms, and survey equipment alarms; and

(7) Radioactive and hazardous materials and effluent, including procedures, equipment, handling, and disposal.

f. Certified Supervisor Written Examination Contents. Written examinations must be administered to certified supervisor candidates. These examinations must be based on the sources discussed in paragraph 6e. The examination must include a representative sampling from the following items, in addition to those required for certified operators, as appropriate to the position and to the facility.

(1) Design, control, and operating limitations for the nuclear facility, including instrumentation characteristics and adjustment, nuclear facility operation, and nuclear facility console control mechanisms;

(2) Radiation hazards that may arise during the performance of experiments;

(3) Nuclear and radiation theory, including details of the fission process, neutron multiplication, source effects, and neutron poison effects;

(4) Procedures and limitations involved in initial equipment loading, alterations in fissionable material configuration, and determination of various internal and external effects on criticality safety;

(5) Procedures, equipment, and facilities available for handling and disposing of radioactive materials and effluent;

(6) Functions, assignments, and responsibilities of the maintenance and technical support organizations as related to nuclear facility safety; and

(7) Applicable portions of the facility Documented Safety Analysis.

7. HAZARD CATEGORY 2/CATEGORY B REACTOR SPECIFIC REQUIREMENTS.

This section provides additional position-specific training requirements for Hazard Category 2/Category B reactor personnel.

a. Reactor Operator and Senior Reactor Operator Training.

(1) Training for reactor operators and senior reactor operators should take into account the previous experience, training, and level of responsibility of the candidate.

(2) Senior reactor operator training must be sufficiently comprehensive to develop the knowledge and skills commensurate with the position and cover areas which are fundamental to the candidate's job duties.

(3) Initial and continuing training must include topics addressed in paragraphs 7c and 7d below.

(4) The qualification program must include classroom-type and on-the-job training to assure familiarity with all required aspects of reactor operation, including anticipated transients and accident conditions. Where construction precludes on-the-job training, practical experience at similar reactors, training on simulators, and other appropriate training is acceptable.

b. Fuel Handling Operations. All fuel handling operations must be performed by or under the direct supervision of a person certified to perform the required functions. The requirements below are not necessary if fuel handling is performed by persons trained for such as part of reactor operator and senior reactor operator certification programs.

(1) A specific training program must be established to certify fuel handling operators and supervisors. The program must include training for their assigned tasks.

(2) The program for fuel handling operators and supervisors must consist of initial and continuing training. Training and examination may be limited to that needed for fuel handling safety, the impact of fuel handling on safety, and actions to be taken during abnormal and emergency conditions.

c. Reactor Operator Written Examination Contents. Written examinations must be administered to reactor operator candidates. These examinations must contain a representative selection of questions on the knowledge and skills identified from learning objectives developed from the analysis of the job and from information in Documented Safety Analysis, Technical Safety Requirements, system

description manuals and operating procedures, lessons learned from Occurrence Reports, and other applicable sources. The examination must include a representative sampling from the following items, as appropriate to the position and to the facility.

(1) Facility design and operating characteristics, including features of facility design, design and operating characteristics and limitations, safety and emergency systems, experiment and test facilities, engineered safety features, and shielding;

(2) Principles of facility operation, including principles of reactor operation, radiological protection, effects of experiments, basic reactor theory, and heat transfer, fluid flow and thermodynamics, as necessary, for the specific design of the reactor;

(3) Instrumentation and control, including nuclear instruments, process instruments, control systems, radiation monitoring systems and survey equipment, experiment and test facility instrumentation, and manipulation of reactivity controls; and

(4) Procedures and Technical Safety Requirements including normal, abnormal, emergency, radiological and hazardous materials control and administrative procedures, and operational limitations.

d. Senior Reactor Operator Written Examination Contents. Written examinations must also be administered to senior reactor operator candidates. These examinations must be based on the sources discussed in paragraph 7c. The examination must include a representative sampling from the following items, in addition to those required for reactor operators, as appropriate to the position and to the facility.

(1) Radioactive materials handling, including special nuclear material (SNM) and radioactive materials hazards, handling, disposal, and safe practices; and

(2) Advanced theory and operation, including reactivity effects during experimental and maintenance activities, fuel handling, fuel burnup and reactivity worth, alterations in core configuration, Technical Safety Requirements bases, and administrative responsibilities associated with the facility and appropriate for the senior reactor operator's level of responsibility.

8. HAZARD CATEGORY 1/CATEGORY A REACTOR SPECIFIC REQUIREMENTS.

This section provides additional position-specific training requirements for Hazard Category 1/Category A reactor personnel.

a. Engineering Expertise on Shift Requirements. The contractor must ensure that the operating shift possesses adequate engineering and accident assessment expertise. This may be accomplished by designating a Shift Technical Advisor (STA) for each shift, or by combining the STA position with the shift supervisor or an on-shift senior reactor operator. If the combined approach is utilized, the designated STA must meet the following qualifications:

(1) Currently certified as a senior reactor operator; and

(2) Successful completion of the STA training requirements in paragraph 8c, and one of the following educational requirements:

(a) Baccalaureate in engineering;

(b) Professional engineer's license;

(c) Baccalaureate in engineering technology including course work in the physical, mathematical, or engineering sciences; or

(d) Baccalaureate in a physical science including course work in the physical, mathematical, or engineering sciences.

b. Simulator Requirements. DOE production reactors must have a full-scope simulator that meets the requirements contained in ANSI/ANS 3.5-1998, Nuclear Power Plant Simulators for Use in Operator Training, and Regulatory Guide Positions 1.3 and 1.4 contained in Nuclear Regulatory Commission Regulatory Guide 1.149, Revision 3, of October 2001, Nuclear Power Plant Simulation Facilities for Use in Operator Licenses and License Examinations, for reactor operator and senior reactor operator training.

(1) If a full-scope simulator is to be utilized for more than one production reactor, the differences between the simulator and reactor must be identified and documented by the operating organization and must be approved by the Heads of Field Organizations/Field Element Manager for NNSA Operations. These differences should not be so significant that they have an adverse impact on the ability of the simulator to meet the requirements and guidance of ANSI/ANS 3.5-2009.

(2) The need for a full-scope or part-task simulator for DOE Hazard Category 1/Category A test and research reactors must be based on an evaluation conducted by the operating organization. The evaluation must consider whether adequate training may be achieved by actual facility maneuvers, drills, part-task simulators, or combinations of these. The evaluation must also consider the ability to adequately provide in-facility training covering all operator actions where timely operator action must be taken to bring the reactor to, or maintain it in, a safe condition. The operating contractor should also evaluate the ability to provide adequate training in normal

operations, anticipated transients, and accident conditions. The assessment (evaluation) of the need for a simulator (for other than production reactors) must be approved by the Heads of Field Organizations/Field Element Manager for NNSA Operations and the Program Secretarial Officer/Deputy Administrator, NNSA.

c. Shift Technical Advisor. Shift Technical Advisor training must include:

(1) Accidents analyzed in the facility Documented Safety Analysis and the consequences of these accidents;

(2) Thermodynamics/fluid flow, reactor physics, system engineering, nuclear instrumentation, process computer, and facility response;

(3) The duties, responsibilities, and authorities of the STA;

(4) Performance of control manipulations on the simulator (for those facilities having simulators), by actual facility maneuvers or drills, or combinations of these;

(5) Response to and analysis of facility transients and accidents; and

(6) The relationship of accident conditions to offsite consequences and protective action strategies.

d. Fuel Handling Operations. Fuel handling operations must be performed by or under the direct supervision of a person certified to perform the required functions. The requirements below are not necessary if fuel handling is performed by persons trained for such as part of reactor operator and senior reactor operator certification programs:

(1) A specific training program must be established to certify fuel handling operators and supervisors. The program must include training for their assigned tasks; and

(2) The program for fuel handling operators and supervisors must consist of initial and continuing training. Training and examination may be limited to that needed for fuel handling safety, the impact of fuel handling on safety, and actions to be taken during abnormal and emergency conditions.

e. Reactor Operator Written Examination Contents. Written examinations must be administered to reactor operator candidates. These examinations must contain a representative selection of questions on the knowledge and skills identified from learning objectives developed from the analysis of the job and from information in facility Documented Safety Analysis, Technical Safety Requirements, system description manuals and operating procedures, lessons learned from Occurrence Reports, and other applicable sources. The examination must include a

representative sampling from the following items, as appropriate to the position and to the facility:

(1) Fundamentals of reactor theory, including fission process, neutron multiplication, source effects, control rod effects, criticality indications, reactivity coefficients, and poison effects;

(2) General design features of the core, including core structure, fuel elements, control rods, core instrumentation, and coolant flow;

(3) Mechanical components and design features of the primary system;

(4) Secondary coolant and auxiliary systems;

(5) Facility operating characteristics, and reasons for these characteristics, during steady state and transient conditions, including coolant chemistry, causes and effects of temperature, pressure and reactivity changes, effects of load changes (if applicable), and operating limitations;

(6) Reactivity control mechanisms and instrumentation, including design, components, and functions;

(7) Control and safety systems, including design, components, functions, instrumentation, signals, interlocks, failure modes, and automatic and manual features;

(8) Emergency systems, including components, capacity, and functions;

(9) Shielding, isolation, and containment/confinement design features, including access limitations;

(10) Procedures and Technical Safety Requirements including normal, abnormal, emergency, and administrative procedures; and operational limitations;

(11) Radiation monitoring systems, including purpose, operation, alarms, and survey equipment;

(12) Radiological safety principles and procedures;

(13) Procedures and equipment available for handling and disposal of radioactive and other hazardous materials and effluent;

(14) Principles of heat transfer, thermodynamics and fluid mechanics; and

(15) Use of installed facility systems for the control and mitigation of an accident in which the core may be severely damaged.

f. Senior Reactor Operator Written Examination Contents. The senior reactor operator written examination must be based on the sources discussed in paragraph 8e. The examination must include a representative sampling from the following items, in addition to those required for reactor operators, as appropriate to the position and to the facility:

(1) Conditions and limitations for facility operations;

(2) Operating limitations in the Technical Safety Requirements and their bases;

(3) Procedures required to obtain authority for design and operating changes in the facility;

(4) Radiation hazards that may arise during normal and abnormal situations, including maintenance activities and various contamination conditions;

(5) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations;

(6) Procedures and limitations for initial core loading, alterations in core configuration, control rod programming, and determination of various internal and external effects on core reactivity; and

(7) Fuel handling facilities and procedures.

g. Operating Crew/Shift Training.

(1) Reactor operator candidates must be assigned to an operating crew full-time for a minimum of 3 months shift training with no concurrent duties that are not related to the operation of the facility. During this period, under the observation and control of a certified reactor operator, the trainee must manipulate the facility controls and perform the same duties as a certified reactor operator.

(2) Senior reactor operator candidates must be assigned to an operating crew full-time for a minimum of 3 months shift training with no concurrent duties that are not related to the operation of the facility. During this period, under the observation and control of a certified senior reactor operator, the trainee must supervise the manipulation of the facility controls and perform the same duties as a certified senior reactor operator.

DEFINITIONS

1. Auxiliary Operator is an operator whose duties and responsibilities include balance of plant operations typically outside the control area.

2. Category A Reactor Facilities means those production, test, and research reactors designated by DOE based on power level (e.g., design thermal power rating of 20 megawatts steady state and higher), potential fission product inventory, and experimental capability. Category A reactors are Hazard Category 1 nuclear facilities.

3. Category B Reactor Facilities means those test and research reactors designated by DOE based on power level (e.g., design thermal power rating of less than 20 megawatts steady state), potential fission product inventory, and experimental capability. Category B reactors are Hazard Category 2 nuclear facilities.

4. Certification means the process by which contractor facility management provides written endorsement of the satisfactory achievement of qualification of a person for a position.

5. Controls means, when used with respect to nuclear reactors, apparatus and mechanisms that, when manipulated, directly affect the reactivity or power level of a reactor or the status of an engineered safety feature. When used with respect to any other nuclear facility, "controls" means apparatus and mechanisms, that, when manipulated could affect the chemical, physical, metallurgical, or nuclear process of the facility in such a manner as to affect the protection of health and safety.

6. Critical Assembly means special nuclear devices designed and used to sustain nuclear reactions, which may be subject to frequent core and lattice configuration changes and which frequently may be used as mockups of reactor configurations. (10 CFR 830) For purposes of this Order, critical assemblies are considered Hazard Category 2 nuclear facilities or Category B reactors.

7. Documented Safety Analysis means a documented analysis of the extent to which a nuclear facility can be operated safely with respect to workers, the public, and the environment, including a description of the conditions, safe boundaries, and hazard controls that provide the basis for ensuring safety. (10 CFR 830)

8. Education is the successful completion of the requirements established by an accredited educational institution.

9. Engineered Safety Features mean systems, components, or structures that prevent and/or mitigate the consequences of potential accidents described in the DSA including the bounding design basis accidents.

10. Exception as used in this order, refers to a release of an individual from portions of a training program through prior education, experience, evaluation of work products, training, and/or testing that is determined using a DOE approved procedure.

11. Fissionable Materials mean a nuclide capable of sustaining a neutron-induced fission chain reaction (e.g., uranium-233, uranium-235, plutonium-238, plutonium-239, plutonium-241, neptunium-237, americium-241, and curium-244).

12. Fissionable Materials Handler is a person certified by contractor facility management to manipulate or handle significant quantities of fissionable materials, or manipulate the controls of equipment used to produce, process, transfer, store, or package significant quantities of such materials.

13. Full-Scope Simulator is a simulator incorporating detailed modeling of systems of the reference facility with which the operator interfaces in the control room environment. The control area operating consoles are included. Such a simulator demonstrates expected facility response to normal and abnormal conditions.

14. Graded Approach means the process of ensuring that the level of analysis, documentation, and actions used to comply with a requirement are commensurate with: (1) the relative importance to safety, safeguards, and security; (2) the magnitude of any hazard involved; (3) the life cycle stage of a facility; (4) the programmatic mission of the facility; (5) the particular characteristics of a facility; (6) the relative importance of radiological and nonradiological hazards; and (7) any other relevant factor. (10 CFR 830) Proper use of the systematic approach to training ensures the application of the graded approach.

15. Hazard Categories. The consequences of unmitigated releases of radioactive and/or hazardous material are evaluated as required by 10 CFR 830 and classified by the following hazard categories:

    a. Category 1. The hazard analysis shows the potential for significant offsite consequences.

    b. Category 2. The hazard analysis shows the potential for significant onsite consequences.

    c. Category 3. The hazard analysis shows the potential for only significant localized consequences.

16. Instructional Analyst/Developer is the individual primarily involved in the analysis, design, development, and implementation of training for job positions/activities in nuclear facilities. This individual works under the direction of the Training Manager and in coordination with the training instructors to 1) conduct needs and job analysis to identify training requirements (valid task list, training requirements matrix), 2) design training including determination of training setting and development of learning objectives, evaluation standards, and examination test items, 3) develop training materials including lesson plans and trainee support materials, 4) conduct classroom, on-the-job, simulator, or laboratory training, and 5) assist line management in the evaluation of training program evaluations.

17. Job Analysis is a systematic method used in obtaining a detailed listing of the tasks of a specific job.

18. Maintenance Personnel are persons responsible for performing maintenance on engineered safety features and support systems as identified in the Documented Safety Analysis.

19. Manager refers to a person whose assigned responsibilities include one or more of the following: nuclear safety, operational efficiency and reliability, control of onsite emergencies, and any other activities necessary to safeguard the health and safety of the workforce, the general public, and the environment. Operational responsibilities include prioritizing and assessing facility activities including modifications, and overseeing the operating organization. This functional level typically includes the Plant/Facility Manager or Director, the Operations Manager, the Maintenance Manager, the Training Manager, and the Technical Manager.

20. Medical Examination means an examination performed by a licensed physician, or an examination performed by physician's assistant that is subsequently reviewed and approved by a licensed physician, to determine the physical condition and general health of a person for duty

21. Must, Should, and May: must is used to denote a requirement; should is used to denote a recommendation; and may is used to denote permission, neither a requirement nor a recommendation.

22. Nonreactor Nuclear Facility means those facilities, activities, or operations that involve, or will involve, radioactive and/or fissionable materials in such form and quantity that a nuclear or a nuclear explosive hazard potentially exists to workers, the public, or the environment, but does not include accelerators and their operations and does not include activities involving only incidental use and generation of radioactive materials or radiation such as check and calibration sources, use of radioactive sources in research and experimental and analytical laboratory activities, electron microscopes, and X-ray machines. (10 CFR 830)

23. Nuclear Experience when used in reference to Hazard Category 1/Category A and Hazard Category 2/Category B Reactors, is experience acquired at commercial, production, training, test, military, or research reactors and includes experience acquired in reactor facility startup activities or operation. Experience in design, construction, maintenance, or related technical services that are job-related may also be considered. Appropriate research, or teaching, or both may be counted as nuclear experience. When used in reference to Nonreactor Nuclear Facilities, is experience acquired at any facility in which radioactive materials are routinely handled, stored, processed, or utilized.

24. Nuclear Facility means a reactor or a nonreactor nuclear facility where an activity is conducted for or on behalf of DOE and includes any related area, structure, facility, or activity to the extent necessary to ensure proper implementation of the requirements established in 10 CFR 830.

25. Operable means the state of being operated or having the potential for being operated to fulfill the mission it was designed for. A facility that cannot be operated on a day-to-day basis because of refueling, extensive modifications, or technical problems is still considered to be operable. A facility that has been officially placed in a standby or shutdown condition, or in an environmental remediation status, but in which personnel manipulate or handle fissionable materials, radioactive materials, or tritium in such form and quantity that a nuclear hazard potentially exists to the employees or the general public, or manipulate the controls of equipment used to produce, process, transfer, or store such materials, is also considered operable.

26. Operators are persons responsible for performing operations associated with engineered safety features as identified in the Documented Safety Analysis, operating support systems which could affect engineered safety features, or conducting activities with special nuclear materials and/or radioactive materials. Duties may include manipulating facility controls, monitoring parameters, and operating facility equipment. Operators include reactor operators, fissionable material handlers, tritium facility operators, chemical process operators, waste tank operators, and enrichment facility operators.

27. Operating Organization is the contractor organization responsible for facility operation, maintenance, and technical support services related to DOE nuclear facility operations.

28. Operational Drill is a drill conducted in the facility which exercises process/facility equipment, procedures, and level of knowledge for certified positions. These activities are also intended to demonstrate knowledge of operational procedures during abnormal conditions.

29. Operational Evaluation is a documented evaluation of an individual's knowledge and skills for a position requiring certification. The operational evaluation is a facility walkthrough that may include system and/or component operation, or simulation of operations, during which the candidate is observed and questioned regarding procedures, safety implications, and Technical Safety Requirements (TSRs).

30. Operations Management are those individuals who are responsible for supervision of operators and their supervisors and maintaining the safety envelope of the facility/operation. Their duties include the review, approval, and implementation of the safety basis documents as described in the Documented Safety Analysis. Examples of these positions include operations managers, shift managers/supervisors, Shift Technical Advisors, and shift engineers.

31. Participation is taking an active role in the duties and responsibilities relative to the function for which the candidate/trainee is being considered. Simple observation is not considered participation.

32. Performance Demonstration is a documented evaluation of an individual's knowledge and skills for a position requiring only qualification (including non-reactor operator personnel at a reactor). The intent of the process is similar to that of an Operational Evaluation but tailored to more limited job requirements.

33. Power Plant Experience is experience acquired in the testing, operation, or maintenance of nuclear or other power generating facilities. Experience in design and construction may be considered applicable power plant experience and should be evaluated on a case-by-case basis.

34. Qualification means education, experience, training, examination, and any special requirements necessary to perform assigned responsibilities for a given position.

35. Reactor Operator means a person certified by contractor nuclear facility management to operate (manipulate the controls of) a DOE-owned reactor.

36. Safety Analysis means a documented process: (1) to provide systematic identification of hazards within a given DOE operation; (2) to describe and analyze the adequacy of measures taken to eliminate, control, or mitigate identified hazards; and (3) to analyze and evaluate potential accidents and their associated risks.

37. Safety Basis means the documented safety analysis and hazard controls that provide reasonable assurance that the DOE nuclear facility can be operated safely in a manner that adequately protects workers, the public, and the environment. (10 CFR 830)

38. Senior Reactor Operator means a person certified by contractor nuclear facility management to operate and direct the operation of a DOE-owned reactor

39. Shift Supervisor is a qualified or certified person in the operating organization designated by contractor facility management to directly supervise operations, operational activities, and operations-related activities of personnel at DOE-owned Hazard Category 1, 2, and 3 nuclear facilities. Substitute titles may be used for positions of equivalent functions.

40. Shift Technical Advisor (STA) is a person who has been assigned to provide on-shift advice and counsel to shift operating personnel during shift activities and to help determine cause and mitigation of facility accidents.

41. Significant Quantity of Fissionable Materials is the minimum quantity of fissionable material in designated form for which control is required to maintain subcriticality under all normal and credible abnormal conditions.

42. Supervisors are individuals who are responsible for the quantity and quality of work performed and who direct the actions of operators, fissile material handlers, technicians, or maintenance personnel. Supervisors typically include, but are not limited to, reactor supervisors, fissionable material handler supervisors, tritium operator supervisors, chemical process operator supervisors, waste tank operator supervisors, maintenance supervisors, technician supervisors, and technical support supervisors. Their duties include ensuring that work is performed in compliance with procedures, policies, and industrial safety practices.

43. Task is a well-defined unit of work having an identifiable beginning and end which is a measurable component of the duties and responsibilities of a specific job.

44. Task Analysis is the systematic process of examining a task to identify skills, knowledge, and/or abilities required for successful task performance.

45. Technical Safety Requirements (TSRs) mean the limits, controls, and related actions that establish the specific parameters and requisite actions for the safe operation of a nuclear facility and include, as appropriate for the work and hazards identified in the documented safety analysis for the facility: Safety limits, operating limits, surveillance requirements, administrative and management controls, use and application provisions, and design features, as well as a bases appendix. (10 CFR 830)

46. Technicians are principally involved in calibration, inspection, troubleshooting, testing, maintenance, and radiation protection activities. Examples are laboratory technicians, instrument technicians, industrial hygiene, environmental, quality control, and decontamination and decommissioning (D&D) technicians, and radiological control technicians.

47. Technical Staff are personnel responsible for supervision, design, evaluation, modification, testing, and performance of technical support functions for the operating organization. Examples of technical staff responsibilities include: surveillance and testing related to normal facility operation and operation of safety-related systems; analyzing routine operational/facility data; planning modifications to facility safety systems; providing technical assistance during normal, abnormal, and emergency facility conditions to offer technical problem resolution to operations in their area of expertise; providing engineering/technical assistance in support functions to the facility such as radiological, quality assurance, and for initial design or modifications that impact nuclear safety. Technical staff typically has expertise in mechanical, electrical, instrumentation and control, chemistry, radiation protection, safety, quality assurance/independent assessment, software quality assurance, facility engineering, system/process engineering, safety basis engineering, criticality safety, or nuclear safety.

48. Training is instruction designed for acquisition of knowledge, skills, and abilities to develop or improve job performance.

49. Training Implementation Matrix (TIM) is a document prepared by the operating organization and approved by DOE that identifies those sections of the Contractor Requirements Document (CRD) to this order that are applicable to a particular facility. The TIM defines and describes the application of the selection, qualification, certification, and training requirements of this Order. It defines the organization, planning, and administration of the program and sets forth the responsibility, authority, and methods for conducting training, and provides justification for sections of the CRD to this order that are not included.

50. Training Instructor is the individual(s) with duties and responsibilities for instructing personnel or developing training materials.

51. Training Organization Personnel are responsible for working with the line organization to identify, meet, and monitor training needs in support of the facility mission. Training

organization personnel assist line organizations in determining training program content needs; developing training materials, scheduling training, and delivering training programs; validating completion; and evaluation of the training program for the operating organization. Training organization personnel may include, but are not limited to, the Training Manager, Instructor, Training Analysts, and Training Developers.

52. Training Program is a planned, organized sequence of activities designed to prepare individuals to perform their jobs, to meet a specific position or classification need (e.g., qualification and/or certification), and to maintain or improve their performance on the job.