

NUCLEAR CRITICALITY SAFETY DEPARTMENT  
QUALIFICATION PROGRAM

K. J. Carroll

R. G. Taylor

C. A. Worley

Nuclear Criticality Safety Department  
Health, Safety, Environment and Accountability Organization

RECEIVED  
JAN 03 1997  
OSTI

September 6, 1996

Prepared by the  
Oak Ridge Y-12 Plant  
Oak Ridge, Tennessee 37831  
managed by  
Lockheed Martin Energy Systems, Inc.  
for the  
U. S. DEPARTMENT OF ENERGY  
under contract  
DE-AC05-84OR21400

MASTER

13V13087  
177-002

#### DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

**DISCLAIMER**

**Portions of this document may be illegible  
in electronic image products. Images are  
produced from the best available original  
document.**

**LOCKHEED MARTIN ENERGY SYSTEMS, INC.**

**QUALIFICATION PROGRAM**

**NUCLEAR CRITICALITY SAFETY DEPARTMENT (NCSD)**

Approvals:

Qualification Verification Official:

R. G. Taylor

Superintendent, NCSD:

[Signature]

## TABLE OF CONTENTS

Front Cover Page	1
Table of Contents	2
Purpose	3
References	3
Scope	3
Definitions	3
Qualification Programs	5
Task and Duty Assignment Qualifications	7
Program, Task and Duty Assignment Initial Qualification	11
Maintenance of Qualification and Requalification	16
Qualification Tracking	17
Evaluation of Training and Qualification	18
 <u>References</u>	
Figure 1 - Qualification Paths	6
 <u>Tables</u>	
Table 1 - Task and Duty Assignment Qualification	8

## PURPOSE

- 1.1 The Nuclear Criticality Safety Department (NCSD) is committed to developing and maintaining a staff of highly qualified personnel to meet the current and anticipated needs in Nuclear Criticality Safety (NCS) at the Oak Ridge Y-12 Plant. This document defines the Qualification Program to address the NCSD technical and managerial qualification as required by the Y-12 Training Implementation Matrix (TIM).
- 1.2 This Qualification Program is in compliance with DOE Order 5480.20A and applicable Lockheed Martin Energy Systems, Inc. (LMES) and Y-12 Plant procedures. It is implemented through a combination of LMES plant-wide training courses and professional nuclear criticality safety training provided within the department.
- 1.3 This document supersedes Y/DD-694, Revision 2, 3/27/96, *Qualification Program, Nuclear Criticality Safety Department*. There are no backfit requirements associated with revisions to this document.

## REFERENCES

- 2.1 DOE Order 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*
- 2.2 DOE-STD-1070-94, *Guidelines for Evaluation of Nuclear Facility Training Programs*
- 2.3 Y90-series Training and Qualification Procedures
- 2.4 LMES ESS-TQ-series Training and Qualification Procedures
- 2.5 10-027, *Plant Training Program*
- 2.6 Y/DD-552, *Nuclear Criticality Safety Department Self-Assessment Program*
- 2.7 Y/DD-696, *Training Implementation, Nuclear Criticality Safety Department*
- 2.8 Y/DD-710, *Guidance for the Development of Continuing Technical Training, Nuclear Criticality Safety Department*

## SCOPE

- 3.1 This Qualification Program is applicable to all technical and managerial NCSD personnel, including temporary personnel, sub-contractors and/or LMES employees on loan to the NCSD, who perform the NCS tasks or serve NCS-related positions as defined in sections 5 and 6 of this program.
- 3.2 NCSD training documents referenced in this program are provided in Y/DD-696.

## DEFINITIONS

- 4.1 Candidate: an individual who is in the process of selection, training, or qualification.
- 4.2 Continuing Training: training that is designed to provide assurance that an employee's job assignment proficiency is maintained and enhanced.
- 4.3 Duty Area: an area of responsibility within a job.
- 4.4 Education: the successful completion of the requirements established by an accredited

educational institution.

- 4.5 **Emergency Operations Center (EOC):** an accessible area set aside for providing an assembly area for operational support personnel during an emergency situation.
- 4.6 **Entry Level Requirements:** the requirements established to ensure that the Candidate possesses the knowledge, skills, and abilities to enter a job.
- 4.7 **Exception:** the release of an individual from portions of a training or qualification program through prior education, experience, training, and/or testing.
- 4.8 **Fixed Continuing Training:** tasks identified with fixed retraining intervals.
- 4.9 **Flexible Continuing Training:** the variable portion of continuing training based on feedback from line management, training evaluations, industry operating events, and changes to the facility and its procedures.
- 4.10 **Individual Development Plan (IDP):** a document used to identify and document managerial and administrative responsibilities of a manager or senior staff person. It serves as a guide for the learning activities which address those responsibilities.
- 4.11 **Job Fundamentals Requirements:** the basic knowledge and skills common to all duty areas of a job. These requirements may be derived from the results of a job analysis, industry standards, or incumbent surveys.
- 4.12 **List of Qualified Personnel:** the approved listing of personnel who are qualified to perform NCS Tasks or serve in NCS-related duty assignments.
- 4.13 **Mentor:** a one-on-one advisor/guide/coach to personnel in the NCSD professional Qualification Program.
- 4.14 **Mentoring Checklist:** an instrument used to identify, guide, and document the professional development of technical staff at the program level. The checklist contains learning objectives derived from the applicable tasks/competencies statements.
- 4.15 **Mentoring Checksheet:** an instrument used to identify, guide, and document the professional development of technical staff at the task level. The checksheet contains performance standards derived from the applicable tasks/competencies statements for a particular checklist item, and includes evaluations appropriate to the subject matter.
- 4.16 **Nuclear Experience:** experience acquired at any facility in which radioactive materials are routinely handled, stored, processed, or utilized.
- 4.17 **Qualification:** satisfactory completion of education, experience, training, and any special requirements and/or examinations necessary for performance of assigned responsibilities.
- 4.18 **Qualification Card (Qual Card):** a TMS document that lists completed Qualification Program requirements.

- 4.19 **Qualification Program:** the composite list of requirements, based on job assignment, identified and validated by line management. It includes the formal training process that is used to fully prepare a trainee for the performance of assigned responsibilities.
- 4.20 **Qualification Verification Official (QVO):** an individual designated by line management who controls the record copy of the Qualification Program and verifies that candidates meet qualification requirements.
- 4.21 **Requirements/Qualification Status Report:** a Training Management System (TMS) report which lists an individual's assigned training requirements and the status of each requirement. This report is used to track an individual's progress through a training cycle.
- 4.22 **Supervisor:** as used in this document, the person to whom a Candidate reports administratively (Group Leader, Department Superintendent, HSEA Manager). The terms "Group Leader" and "Supervisor", as used in this document, are synonymous.
- 4.23 **Task:** a defined unit of work.
- 4.24 **Training Implementation Matrix (TIM):** a matrix which defines and describes the application of the selection, qualification, and training requirements of DOE Order 5480.20A.
- 4.25 **Training Management System (TMS):** a data base which reflects the employees hard copy training records. TMS is used to aid the training organization in managing training activities and to assist line management in making work assignments.

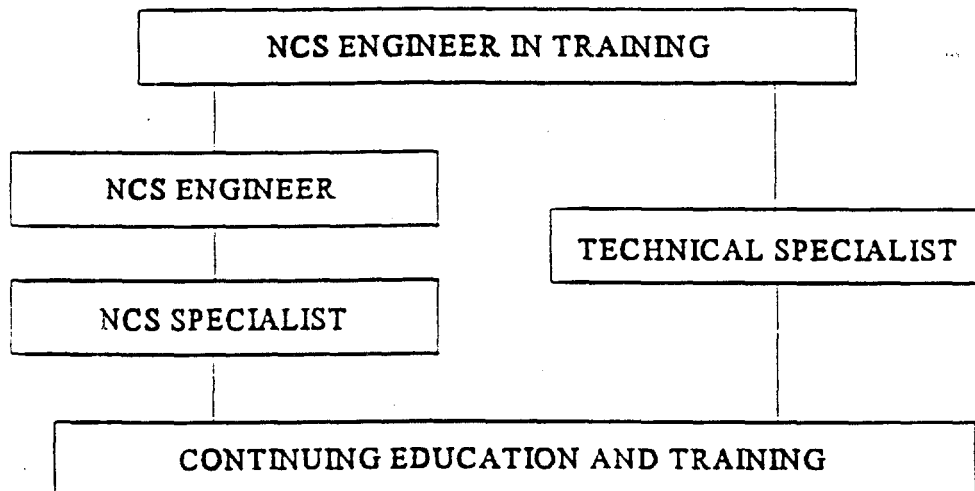
## 5.0 QUALIFICATION PROGRAMS

- 5.1 **Qualification Programs** establish the overall requirements for managerial and technical positions within the NCSD which are NCS related. NCSD Superintendent, NCS Engineer in Training, NCS Engineer, NCS Specialist, Technical Specialist, and Continuing Training Programs are provided for NCSD personnel. All NCSD technical and management personnel who perform or approve activities related to NCS shall be enrolled in one or more of the programs. Technical personnel move through the Qualification Programs starting with Engineer in Training, continuing with one of the technical paths, and ending up in the continuing education and training program as illustrated in Figure 1. NCSD Superintendent and NCS Engineer are Training Implementation Matrix (TIM) positions. Appropriate education and experience requirements are contained in the programs.
- 5.2 **The NCS Engineer in Training Qualification Program** includes requirements for education, job fundamentals, basic theory and practice knowledge, and basic documents knowledge.
- 5.3 **The NCS Engineer Qualification Program** includes requirements for continuing training in job fundamentals, as required, duty area access, functional area specific basic facility knowledge, task qualification in tasks 1 - 4 described in section 6, and experience.
- 5.4 **The NCS Specialist Qualification Program** includes requirements for continuing training in job fundamentals and duty area access, as required, task qualification in tasks 5 and 6 and 2 additional tasks from tasks 7 - 9 described in section 6, and experience.



- 5.5 The Technical Specialist Qualification Program includes requirements for continuing training in job fundamentals, as required, duty area access, basic facility knowledge as necessary to support selected specialization tasks, task qualification in 3 tasks from tasks 1 - 9 described in section 6, and experience.
- 5.6 The NCSD Superintendent Qualification Program includes requirements for LMES managerial job fundamentals and duty area access supplemented with an Individual Development Plan (IDP).
- 5.7 The Continuing Training Qualification Program includes fixed and flexible requirements. The fixed requirements consist of LMES courses required to maintain qualification in job fundamental and duty area access training. The flexible requirements include an Individual Development Plan if appropriate, optional LMES and/or off-site training to enhance and diversify the individuals knowledge, skills, and abilities, and any training needed to address performance deficiencies, facility or procedure changes, or applicable operating experiences.

Figure 1 - Qualification Paths



## TASK AND DUTY ASSIGNMENT QUALIFICATIONS

- 6.1 The qualification to perform NCS tasks or serve in NCS and training related duty assignments is attained on a task or duty assignment specific basis. Tasks and duty assignments addressed are listed below.

6.1.1 NCS Task and Duty Assignment activities:

- |          |  |
|----------|--|
| 6.1.1.1  | Task 1 - External Monitoring                         |
| 6.1.1.2  | Task 2 - NCS Evaluation and Documentation            |
| 6.1.1.3  | Task 3 - Operating Procedure Approval                |
| 6.1.1.4  | Task 4 - NCS Computation                             |
| 6.1.1.5  | Task 5 - NCS Computation Review                      |
| 6.1.1.6  | Task 6 - NCS Evaluation and Documentation Review     |
| 6.1.1.7  | Task 7 - Emergency Response Planning                 |
| 6.1.1.8  | Task 8 - Criticality Accident Alarm System Support   |
| 6.1.1.9  | Task 9 - Order Compliance and NCS Procedures         |
| 6.1.1.10 | Task 10 - Independent Technical Review Board (ITRB)  |
| 6.1.1.11 | Task 11 - Final NCS Technical Documentation Approval |
| 6.1.1.12 | Task 12 - NCS Program Oversight                      |
| 6.1.1.13 | Task 13 - Emergency Operations Center (EOC) Support  |

6.1.2 Training-related Duty Assignments:

- 6.1.2.1 Qualification Verification Official  
6.1.2.2 Mentor  
6.1.2.3 Training Coordinator

- 6.2 NCSD personnel shall be qualified to perform specific tasks through completion of the task specific qualification requirements while working toward the overall program qualification. Note that some tasks are functional area or computer code specific. Qualification in these tasks applies to performing the task for a specific functional area or computer code only.

- 6.3 When used as a basis for qualification, personnel qualified to a higher technical qualification than specified are considered qualified for the position/board/assignment/activity. The hierarchy of technical qualification, from lower to higher, is:

NCS Engineer in Training	or	NCS Engineer in Training
NCS Engineer		Technical Specialist
NCS Specialist		

- 6.4 Summary descriptions, knowledge, skills and abilities (KSAs) requirements, experience requirements, and qualification requirements for the various tasks and duty assignments are provided in Table 1.

Table 1 - Task and Duty Assignment Qualification

TASK OR DUTY ASSIGNMENT	APPLICABLE KNOWLEDGE, SKILLS, ABILITIES	EXPERIENCE REQUIREMENT	QUALIFICATION REQUIREMENT
<p>Task 1 - External Monitoring:</p> <p>Perform a comparison of operating area conditions and activities with the limits and requirements of CSAs or CSRs/Process Descriptions (Ds) and operating procedures in accordance with approved procedures and instructions. Note that this is a functional area specific task and qualification is attained for the assigned functional area only.</p>	<p>Knowledge of NCS theory, standards, procedures, and practices. Knowledge of the process and equipment being analyzed and Operational Safety Requirements (OSRs). Skill in the use of applicable reference documents and drawings. Knowledge of applicable plant, NCSD and operating procedures. Skill in interpersonal communications.</p>	<p>None beyond NCS Engineer in Training requirements</p>	<p>Qualified as NCS Engineer in Training. Completion of the task requirements as listed on the associated Task 1 checksheet and Basic Facility Knowledge checksheet, including Duty Area Access-related LMES training in Rad Worker II and NCS. This is an operating facility specific qualification.</p>
<p>Task 2 - NCS Evaluation and Documentation:</p> <p>Perform NCS evaluation to demonstrate satisfaction of the double contingency principle; document requirements and limits in CSAs/CSRs in accordance with approved procedures.</p>	<p>Knowledge of NCS theory, standards, procedures, and practices. Knowledge of the process and equipment being analyzed and Operational Safety Requirements (OSRs). Skill in the use of applicable reference documents and drawings. Skill in the completion of CSAs/CSRs.</p>	<p>None beyond NCS Engineer in Training requirements</p>	<p>Qualified as NCS Engineer in Training and in Task 1. Completion of the task requirements as listed on the associated Task 2 checksheet.</p>
<p>Task 3 - Operating Procedure Approval:</p> <p>Ensure that CSA/CSR limits and requirements are correctly stated in operating procedures which have been submitted for review, in accordance with approved procedures. Note that this is functional area specific task and qualification is attained for the assigned functional area only.</p>	<p>Knowledge of procedure Y10-103, Writers Guide for Y-12 Plant Operating Procedures. Knowledge of operating processes, equipment, and support activities. Skill in written communication.</p>	<p>None beyond NCS Engineer in Training requirements</p>	<p>Qualified as NCS Engineer in Training and in Task 1 or 2. Completion of the task requirements as listed on the associated Task 3 checksheet. This is an operating facility specific qualification.</p>
<p>Task 4 - NCS Computation:</p> <p>Perform NCS related computer calculations in accordance with approved procedures. Note that this is computer code specific task and qualification is attained for the specified code(s) only.</p>	<p>Knowledge of NCS theory, ANS standards, LMES and Y-12 Plant procedures, and calculation methods. Skill in the use of appropriate computer hardware and software.</p>	<p>None beyond NCS Engineer in Training requirements</p>	<p>Qualification as NCS Engineer in Training and completion of the task requirements as listed on the Task 4 checksheet, including completion of a computer code course taught or sponsored by recognized code developers and/or maintainers or equivalent code experience. This is a computer code specific qualification.</p>

ASK OR DUTY ASSIGNMENT	APPLICABLE KNOWLEDGE, SKILLS, ABILITIES	EXPERIENCE REQUIREMENT	QUALIFICATION REQUIREMENT
<p>Task 5 - NCS Computation Review:</p> <p>perform independent assessments of the adequacy of NCS computations produced by others in accordance with approved procedures. Note that this is a computer code specific task and qualification is attained for the specified code(s) only.</p>	Same as Task 4	None beyond NCS Engineer in Training requirements	Qualified as NCS Engineer in Training and in Task 4. Completion of the task requirements as listed on the associated Task 5 checklist. This is a computer code specific qualification.
<p>Task 6 - NCS Evaluation and Documentation Review:</p> <p>perform assessments of the adequacy of CSAs or SRs/PDs and analyses produced by others in accordance with approved procedures</p>	Same as Task 2.	None beyond NCS Engineer in Training requirements	Qualified as NCS Engineer in Training and in Task 2. Completion of the task requirements as listed on the associated Task 6 checklist.
<p>Task 7 - Emergency Response Planning:</p> <p>Advise Plant Shift Superintendent and Emergency Preparedness (PSS&amp;EP) in matters concerning Nuclear Criticality accident emergency preparedness planning, in accordance with approved procedures.</p>	Knowledge of Y40 series procedures; plant facilities, processes and equipment; and roles and responsibilities of organizations. Technical knowledge of nuclear criticality accident history and experience.	None beyond NCS Engineer in Training requirements	Qualified as NCS-Engineer in Training. Completion of the task requirements as listed on the NCS Task Checklist and associated Task 7 checklist including LMES Assembly Station Director training.
<p>Task 8 - Criticality Accident Alarm System (CAAS) Support:</p> <p>participate as NCSD representative on the Configuration Control Board or the CAAS and act as subject matter expert in setting standards for the siting and testing of CAAS components.</p>	Knowledge of ANSI/ANS-8.3, Y70-151 and facility OSRs. Knowledge of Y-12 CAAS design and installation. Knowledge of Plant Shift Superintendent and Emergency Preparedness (PSS&EP) and Facility Management Organization (FMO) procedures for fixed and portable alarms.	None beyond NCS Engineer in Training requirements	Qualified as NCS Engineer in Training. Completion of the task requirements as listed on the associated Task 8 checklist.
<p>Task 9 - Order Compliance and NCS Procedures:</p> <p>evaluate DOE orders and guidelines; national standards; and LMES and plant procedures for impact on operations of the NCS department.</p>	Knowledge of DOE orders and guidelines, ANSI/ANS standards, and LMES/Y12 procedures that govern NCS activities. Skill in interpretation of complex technical documentation. Skill in written and oral communications, and in interpersonal relations.	None beyond NCS Engineer in Training requirements	Qualified as NCS Engineer in Training. Completion of the task requirements as listed on the associated Task 9 checklist.

SK OR DUTY SIGNMENT	APPLICABLE KNOWLEDGE, SKILLS, ABILITIES	EXPERIENCE REQUIREMENT	QUALIFICATION REQUIREMENT
<p>Task 10 - Independent Technical Review Board (TRB):</p> <p>The Independent Technical Review Board provides the independent review of nuclear criticality evaluations and computations.</p>	<p>Board members have a thorough knowledge of NCS theory and practice, applicable orders, procedures and documents, and plant systems and processes.</p>	<p>8 years nuclear with 5 years nuclear criticality safety and 3 years Y-12 nuclear criticality safety</p>	<p>Qualified as NCS Engineer or Technical Specialist and in Task 5 and/or 6. Completion of the task requirements as listed on the associated Task 10 checklist.</p>
<p>Task 11 - Final NCS Technical Documentation Approval:</p> <p>Provide final approval of NCS technical documentation documents based on recommendation of the ITRB.</p>	<p>This is the NCSD Superintendent's or his designated alternate's responsibility</p>	<p>None beyond NCS Superintendent or Task 10 as appropriate</p>	<p>Qualified as NCS Superintendent or NCS Specialist and in Task 10. Appointed in writing by the NCSD Superintendent.</p>
<p>Task 12 - NCS Program Oversight:</p> <p>Recommend modifications of NCS programs and procedures to ensure safety of operations, and continued improvement in the quality and professionalism of the NCS department.</p>	<p>Individuals performing this oversight need a thorough knowledge of applicable NCS documents and a knowledge of the interaction of NCSD with other disciplines. They need skills in written and oral communication, and in interpersonal relations along with the ability to analyze complex organizational problems and synthesize acceptable alternative solutions.</p>	<p>None beyond NCS Superintendent, NCS Specialist, NCS Engineer, Technical Specialist, or Group Leader as appropriate</p>	<p>Serving as NCSD Superintendent or a NCSD Group Leader, or qualified as a NCS Engineer, NCS Specialist, or Technical Specialist. Appointed in writing by the NCSD Superintendent.</p>
<p>Task 13 - Emergency Operations Center (EOC) Support:</p> <p>Advise plant management of EOC considerations during actual or simulated emergencies in accordance with approved procedures.</p>	<p>Personnel assigned this responsibility need a thorough technical knowledge of criticality safety, plus knowledge of the working procedures of the EOC and the emergency response and management plans of the Y-12 plant. They need skill in assessing and responding to rapidly changing scenarios and the ability to communicate complex issues clearly and accurately.</p>	<p>None beyond NCS Specialist</p>	<p>Qualified as NCS Specialist and in Task 7. Completion of the task requirements as listed on the associated Task 13 checklist.</p>

TASK OR DUTY ASSIGNMENT	APPLICABLE KNOWLEDGE, SKILLS, ABILITIES	EXPERIENCE REQUIREMENT	QUALIFICATION REQUIREMENT
<p>Qualification Verification Official:</p> <p>The QVO verifies the professional qualification of CSD personnel qualification as NCS Engineer in Training, NCS Engineer, NCS Specialist and Technical Specialist) and provides overall direction for the professional Qualification Program.</p>		None beyond NCS Specialist	Qualified as NCS Specialist and as an LMES basic instructor.
<p>Mentor:</p> <p>Mentors serve as one-on-one advisors/guides/coaches to personnel in the professional qualification Program.</p>		None beyond NCS Engineer in Training	Qualified as NCS Engineer in Training, qualified in the task being mentored, and self-study of Y90-080, Y/DD-694, and Y/DD-696
Training Coordinator		2 years nuclear, 6 months Y-12	Qualified as LMES basic instructor with TMS access and performance based training as needed.

## 7.0 PROGRAM, TASK AND DUTY ASSIGNMENT INITIAL QUALIFICATION

- 7.1 All technical and managerial NCSD personnel, including temporary personnel who will perform NCS Tasks, shall be enrolled in a qualification program assigned by their supervisor. Multiple programs, for example, both a managerial and a technical program, may be assigned. Personnel who have completed any managerial or technical program shall be enrolled in continuing training. Additional requirements for subcontractor qualification are provided in Y90-110 and shall be followed.
- 7.2 The overall responsibility for an individual's training rests with the supervisor (Group Leader or Department Superintendent as appropriate). The Supervisor is assisted by the QVO, Training Coordinator (TC), and mentors. In general terms, the Supervisor assigns individuals to a qualification program consistent with their assigned and anticipated duties and the program is then executed through LMES courses and mentored training. The TC assists the Supervisor by notifying the Supervisor of LMES qualification maintenance courses that will be due, by interfacing with the LMES Center for Continuing Education (CCE) to sign the Candidate up for any required courses, and maintaining training records. The QVO assists mentors and verifies qualification at the completion of required training.
- 7.3 Training is guided by a program checklist and amplifying checksheets which are held by the Training Coordinator or Candidate until completion. Upon completion of training required for a task or program, the Supervisor recommends qualification.
- 7.4 After recommendation for qualification in a program, the TC forwards the completed mentoring checklist to the LMES Training Records Center (TRC) and requests generation of the Qualification Card. The TRC verifies that documentation supporting the completion of qualification requirements is on file and forwards the Qualification Card to the QVO for

completion. Final qualification approval shall be performed by the NCSD Superintendent. The completed Qualification Card is returned to the TRC and the TC issues a revision to Y/DD-587, "List of Qualified Personnel", to complete the process.

- 7.5 While in a Qualification Program above the Engineer in Training level, candidates attain qualification to perform task activities. Task qualification is documented on the Task Qualification Record, which is retained in the department training files. As with program qualification, after approval of the task qualification by the NCSD Superintendent the TC issues a revision to Y/DD-587, "List of Qualified Personnel", to complete the process. For both program and task qualification, completed mentoring checksheets which support the mentoring checklists are retained in the department training files.
- 7.6 Tasks 4 and 5 are computer code specific and Tasks 1 and 3 are functional area specific. Initial qualification on these tasks may be attained with as few as one code or area, and over time qualification in additional codes or areas may be achieved. When adding a code or area to an existing task qualification, it is not necessary to requalify on the complete task, nor is a new Task Qualification Record required.
- 7.6.1 To add a new computer code to a Task 4 or 5 qualification, only the applicable Addendum Sheet provided with the Checksheet need be completed. Following completion, the TC issues a revision to Y/DD-587, "List of Qualified Personnel", to complete the process.
- 7.6.2 To add a new area to a Task 1 or 3 qualification, only the applicable portion of the Basic Facility Knowledge Checksheet need be completed. Following completion, the TC issues a revision to Y/DD-587, "List of Qualified Personnel", to complete the process.
- 7.7 Each NCSD technical Candidate may have a lead mentor assigned by the QVO. If assigned, the lead mentor provides overall technical guidance to the Candidate during the qualification process and signs off completed tasks as required. Note that the lead mentor is not necessarily the only mentor the Candidate will have. Other mentors may assist the lead mentor for individual checklist or checksheet items and sign off completed training. If no lead mentor is assigned, the Supervisor will provide overall technical guidance to the Candidate during the qualification process.
- 7.8 Oral boards shall be held for qualification for all technical program qualifications except NCS Engineer in Training and for the NCS Computation and Evaluation Review tasks (Tasks 5 and 6).
- 7.8.1 When required, the oral board shall consist of, as a minimum:
- 7.8.1.1 For programs, the QVO, the NCSD Superintendent or Deputy Superintendent, and at least one NCSD member who is qualified in the subject program and not from the Candidate's group.
- 7.8.1.2 For tasks, the QVO, the applicable Group Leader, and at least one NCSD member who is qualified in the subject task and not from the Candidate's group.

- 7.8.2 Questioning by board members may proceed in any order, and shall continue until all board members are satisfied that the material has been covered in sufficient breadth to allow a judgment on the Candidate's knowledge. Records shall be kept of the questions asked and the board's assessment of the Candidate's response on a scale of 1 - 10 on the Oral Qualification Board Record. The overall grade shall also be recorded on a basis of pass/fail. A "pass" result shall be a unanimous decision of the board. Weak areas noted during a passed oral board shall be discussed with the QVO prior to qualification.
- 7.8.3 If a Candidate fails the oral board, a study plan shall be developed by the QVO addressing the weak areas. After completion of the study plan, and based upon the Candidate's Supervisor recommendation, a second oral board shall be held. The second oral board may focus on the Candidate's weak areas only, at the board's discretion.
- 7.8.4 Should a Candidate fail the second oral board, an individually designed plan shall be developed by the individual's Supervisor and QVO and approved by the NCSD Superintendent. This plan shall be composed of all or parts of the program for initial qualification. As a minimum, the content shall address aspects of qualification judged to be deficient.
- 7.9 For managerial positions or non-technical duty assignments only, individuals may be assigned and serve in these positions prior to the completion of the associated Qualification Program or training as long as they are in the process of completing the training. Any interim measures judged necessary by the individual's Supervisor shall be approved by the individual's Supervisor and NCSD Superintendent or HSEA Manager as appropriate.
- 7.10 Experienced personnel, who may be either permanent staff, sub-contractors, or LMES employees on loan to NCSD, may have experience and qualifications from prior employment in the nuclear industry. In such cases, the qualification process may be expedited to credit previous knowledge, skills and abilities of the individual.
  - 7.10.1 For experienced personnel, an Experienced Personnel Evaluation board may be convened to evaluate the existing knowledge, skills and abilities of the individual and define which portions of the assigned NCS training need to be completed. The board shall consist of a QVO and at least one other NCS Specialist or NCS Engineer.
  - 7.10.2 Actions of the qualification board shall be documented by completing the Experienced Personnel Evaluation Form and by indicating which requirements on the Mentoring Checklists and Checksheets are excepted including the basis of the exception. Completed Experienced Personnel Evaluation forms shall be retained in the NCSD training records and documented in the LMES records with a request for exception if necessary. Acceptable bases for exception of a qualification requirement are provided in Y90-020. In addition, for personnel in managerial positions only, an item may be excepted or waived if it will have no bearing on the duties which will be performed after qualification.



7.10.3 Acceptable documentation of past performance may be any of the following, in order of preference:

- 7.10.3.1 A copy of the output (for example, the report, calculation, or attendance certificate).
- 7.10.3.2 A signed copy of the Candidate's resume, if the activity is documented in the resume.
- 7.10.3.3 A signed statement from the Candidate attesting to performance of the activity.

7.11 The process steps leading to qualification as a NCS Engineer in Training are listed below.

7.11.1 Enter Candidate in NCS Engineer in Training qualification program (TMS # 5939)

- 7.11.1.1 Supervisor obtains associated Mentoring Checksheets from the TC for Candidate.
- 7.11.1.2 If desired, QVO assigns a lead mentor.
- 7.11.1.3 TC verifies education and experience is documented in the training records, signs-up Candidate for LMES courses, and notifies Supervisor of schedule.

7.11.2 Complete NCS Engineer in Training qualification

- 7.11.2.1 Candidate performs self-study activities.
- 7.11.2.2 Candidate discusses with mentor completion of self-study tasks.
- 7.11.2.3 Candidate attends LMES courses.

7.11.3 NCS Engineer in Training qualification verification

- 7.11.3.1 Supervisor reviews checklist and checksheets for completeness and recommends to QVO that Candidate be qualified.
- 7.11.3.2 QVO reviews and verifies Candidate's technical qualification.
- 7.11.3.3 TC forwards completed checklist to Training Records Center and requests generation of Qualification Card.
- 7.11.3.4 All complete the Qualification Card, NCSD Superintendent approves qualification.
- 7.11.3.5 TC enters qualification as NCS Engineer in Training in Candidate's training record and revises Y/DD-587.

7.12 The process steps leading to qualification as a NCS Engineer, NCS Specialist, or Technical Specialist are listed below.

7.12.1 Enter Candidate into individualized continuing training program (TMS # 5770).

- 7.12.1.1 On at least an annual basis, TC issue to Supervisor a listing of continuing LMES courses needed.
- 7.12.1.2 On an annual basis, Supervisor and Candidate jointly develop continuing training activities beyond the LMES requalification activities for the year.
- 7.12.1.3 As required, TC signs-up Candidate for LMES courses and notifies Supervisor of schedule and Candidate attends courses.

**7.12.2 Enter Candidate in NCS Engineer, NCS Specialist or Technical Specialist qualification program, as appropriate (TMS # 5761, 5562 or 5764)**

- 7.12.2.1 Supervisor obtains associated Mentoring Checksheets from the TC for Candidate.**
- 7.12.2.2 If desired, QVO assigns lead mentor.**

**7.12.3 While in training, qualify to perform specific tasks**

- 7.12.3.1 Candidate performs task activities.**
- 7.12.3.2 Mentor signs off task accomplishment.**
- 7.12.3.3 Supervisor recommends and QVO reviews and verifies Candidate's qualification and convenes an oral board (Tasks 5 and 6 only).**
- 7.12.3.4 All complete Task Qualification Report, NCSD Superintendent approves qualification, and TC enters qualification for the task in Candidate's training record and revises Y/DD-587.**

**7.12.4 Complete NCS Engineer, NCS Specialist, or Technical Specialist qualification**

- 7.12.4.1 Candidate performs task activities and attends required LMES courses.**
- 7.12.4.2 Mentor signs off task accomplishment.**
- 7.12.4.3 TC notifies Supervisor of LMES training due and signs the Candidate up for courses as required.**

**7.12.5 NCS Engineer, NCS Specialist, or Technical Specialist qualification verification**

- 7.12.5.1 Supervisor reviews checklist and checksheets for completeness and recommends to QVO that Candidate be qualified.**
- 7.12.5.2 QVO reviews and verifies Candidate's technical qualification and convenes an oral board.**
- 7.12.5.3 TC forwards completed checklist to Training Records Center and requests generation of Qualification Card.**
- 7.12.5.4 All complete the Qualification Card, NCSD Superintendent approves qualification.**
- 7.12.5.5 TC enters qualification as NCS Engineer, NCS Specialist or Technical Specialist as appropriate in Candidate's training record and revises Y/DD-587.**

**7.13 The process steps leading to qualification as a NCS Superintendent are listed below.**

**7.13.1 Enter Candidate in NCS Superintendent qualification program (TMS # 5763)**

- 7.13.1.1 Candidate and HSEA Manager develop IDP.**
- 7.13.1.2 TC verifies education and experience is documented in the training records, signs-up Candidate for LMES courses and notifies Candidate of schedule.**

**7.13.2 Complete NCS Superintendent qualification**

- 7.13.2.1 Candidate completes IDP.
- 7.13.2.2 Candidate discuss with HSEA Manager completion of administrative self-study tasks as appropriate.
- 7.13.2.3 Candidate discuss with QVO completion of technical self-study tasks as appropriate.
- 7.13.2.4 Candidate attends LMES courses.

**7.13.3 NCS Superintendent qualification verification**

- 7.13.3.1 HSEA Manager reviews IDP for completeness and recommends that Candidate be qualified.
- 7.13.3.2 TC forwards completed IDP to Training Records Center and requests generation of Qualification Card.
- 7.13.3.3 All complete the Qualification Card.
- 7.13.3.4 TC enters qualification as NCS Superintendent in Candidate's training record and revises Y/DD-587.

**MAINTENANCE OF QUALIFICATION AND REQUALIFICATION**

- 8.1** For NCSD technical personnel, maintenance of qualification shall be part of continuing education and training. LMES required courses are part of the fixed portion of that program. Maintenance of technical task and program qualifications shall be part of the flexible portion of the program and is achieved by:

- 8.1.1 Satisfactory performance as documented during annual performance reviews. An overall performance rating of "CM" or higher shall be considered satisfactory. Supervisors shall provide the QVO a listing of any group personnel who fail to meet the criteria on an annual basis in conjunction with the Performance Planning and Review process along with a recommendation on which tasks or programs requalification should be conducted.
- 8.1.2 Completion of NCSD Continuing Technical Training. Continuing Technical Training shall be a combination of required reading and NCSD technical discussion meetings. The Continuing Technical Training program is discussed in Y/DD-710 and addresses:
  - 8.1.2.1 Changes in LMES, Y-12 and NCSD procedures
  - 8.1.2.2 Changes in DOE Orders and Industry Codes and Standards
  - 8.1.2.3 Industry and site experience, including lessons learned
  - 8.1.2.4 Client feedback
  - 8.1.2.5 Deficiency trends
  - 8.1.2.6 Management self-assessments
  - 8.1.2.7 Internal and external audits and surveillance

- 8.2 An individual's qualification in a program or task may be removed for failure to meet the requirements of section 8.1 or for reasons of unsatisfactory performance. As necessary, the individual's Supervisor shall recommend removal of qualification to the QVO. The QVO shall develop and recommend corrective action to the NCSD Superintendent who shall approve any removal of qualification. Should qualification in a task or program be removed for any reason, the TC will remove the individual from the list of qualified personnel, Y/DD-587.
- 8.2.1 Removal of task or program qualification for reasons of unsatisfactory performance shall be based on continuing failure to perform the activities embodied by the qualification in a satisfactory manner and documented in the Performance Planning and Review process and/or in the Positive Discipline program as appropriate.
- 8.2.2 Requalification following removal for reasons of unsatisfactory performance shall be performed by completion of an individually designed program developed by the individual's Supervisor and QVO and approved by the NCSD Superintendent. This program shall be composed of all or parts of the program for initial qualification. As a minimum, the content shall address aspects of qualification judged to be deficient based upon the unsatisfactory performance which led to the removal of the qualification.
- 8.3 Failure to complete LMES required Job Fundamental or Duty Area Access compliance courses or NCSD Continuing Technical Training shall be rectified at the earliest opportunity, but formal removal and requalification on NCSD technical program or task qualifications is not required. Supervisors may recommend disqualification should the deficiency in LMES required Job fundamental or duty area access compliance courses or NCSD Continuing Technical Training impact the ability of the deficient individual to perform assigned tasks.
- 8.4 On a biennial basis, satisfactory completion of the continuing training shall be documented by the Training Coordinator (TMS Module 17890, NCS Engineer Requalification).

#### QUALIFICATION TRACKING

- 9.1 The completion of a Qualification Program shall be documented in the LMES TMS system with a qualification card as specified in Y90-010, a copy of which shall be maintained in the department level training records.
- 9.2 The completion of task qualification requirements shall be documented with a Task Qualification Record which shall be maintained in the department level training records.
- 9.3 Y/DD-587, *List of Qualified Personnel*, shall be maintained by the NCSD Training Coordinator and contain a listing of NCSD personnel who are currently qualified in programs, tasks, and duty assignments and the date their qualification was attained. An example of the tables which make up Y/DD-587 can be found in Y/DD-696. The list shall be revised as necessary to account for new, removed, and restored qualifications.
- 9.4 On a quarterly basis, the Training Coordinator shall generate a Requirements/Qualification Status Report for all NCSD personnel and distribute the list to the applicable supervisor.

## EVALUATION OF QUALIFICATION AND TRAINING

- 10.1 Periodic self-assessments of the qualification program and associated training shall be performed to evaluate the effectiveness of the program. The assessments shall be performed on an annual basis and are intended to address three subjects as a minimum. Questions listed below are examples only.
  - 10.1.1 Compliance: Is the program documentation complete and correct? Are technical and managerial personnel enrolled in the qualification program? Is the program current with respect to applicable DOE Orders, industry standards and experience, and LMES/Y-12 procedures?
  - 10.1.2 Implementation: Are personnel completing qualification within the anticipated intervals? Is off-site training being utilized? Are personnel completing their assigned continuing development? Are managers and Group Leaders completing their Individual Development Plans as applicable?
  - 10.1.3 Effectiveness: Is the program producing sufficient qualified staff? Does the training program provide the knowledge required? Is it being retained after qualification?
- 10.2 The annual self-assessment shall be directed by the QVO and conducted in accordance with Y/DD-552, *Nuclear Criticality Safety Department Self-Assessment Program*, DOE Standard 1070-94, and Y90-100, *Conduct of Training Program Evaluation*, as appropriate.
- 10.3 A biennial review of training materials shall be conducted in accordance with Y90-100.
- 10.4 The results of all reviews and self-assessments, including resulting corrective actions, shall be filed in the department training files.

Distribution:

K. J. Carroll

S. O. Oran

R. G. Taylor

C. A. Worley

✓A. K. Lee/DOE-OSTI, 9983-30, MS-8175 (2)

Y-12 Central Files, 9711-5, MS-8169