Y/DD-696, Rev. 3

NUCLEAR CRITICALITY SAFETY DEPARTMENT

TRAINING IMPLEMENTATION

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

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TRAINING IMPLEMENTATION

NUCLEAR CRITICALITY SAFETY DEPARTMENT (NCSD)

Approvals:

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Superintendent, NCSD:

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1.0 PURPOSE

1.1 The Nuclear Criticality Safety Department (NCSD) is committed to developing and maintaining a staff of qualified personnel to meet the current and anticipated needs in Nuclear Criticality Safety (NCS) at the Oak Ridge Y-12 Plant. The NCSD Qualification Program is described in Y/DD-694, *Qualification Program, Nuclear Criticality Safety Department*. This document provides a listing of the roles and responsibilities of NCSD personnel with respect to training and details of the Training Management System (TMS) programs, Mentoring Checklists and Checksheets, as well as other documentation utilized to implement the program.

1.2 This document supersedes Y/DD-696, Revision 2, dated 3/27/96, *Training Implementation, Nuclear Criticality Safety Department*. There are no backfit requirements associated with revisions to this document.

2.0 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-694, *Qualification Program, Nuclear Criticality Safety Department*
2.8 Y/DD-710, *Guidance for the Development of Continuing Technical Training, Nuclear Criticality Safety Department*

3.0 SCOPE

This Training Implementation document is applicable to all technical and managerial NCSD personnel, including temporary personnel, sub-contractors and/or LMES employees on loan to the NCSD, who are in a qualification program as defined in Y/DD-694, *Qualification Program, Nuclear Criticality Safety Department*.

4.0 DEFINITIONS

Terms used in this document are defined in Y/DD-694, *Qualification Program, Nuclear Criticality Safety Department*.

5.0 ROLES AND RESPONSIBILITIES

With respect to training, the roles and responsibilities of NCSD personnel are described below.

5.1 Line Organization Positions

5.1.1 Department Superintendent

The NCSD Superintendent, or his designee, is responsible for all aspects of the NCSD qualification program, including, but not limited to:

5.1.1.1 planning, budgeting, and staffing the NCSD to ensure that training and qualification requirements are met.
5.1.1.2 ensuring that the personal characteristics of individual NCSD Candidates are appropriately considered in the qualification process.
5.1.1.3 serving on the oral qualification board for NCSD programs.
5.1.1.4 approving the qualification of each of the NCSD Candidates at the completion of the qualification process.
5.1.1.5 ensuring that information is conveyed to staff about relevant changes in regulations, orders, standards; NCS lessons learned; and relevant changes in plant configuration or procedures.
5.1.1.6 evaluating personnel performance and training effectiveness.
5.1.1.7 removing qualification should such action be necessary and approving any requalification program recommended after removal of qualification for reasons of unsatisfactory performance.
5.1.1.8 appointing the Qualification Verification Official (QVO) and Training Coordinator (TC).

5.1.2 Group Leaders

The group leaders (Department Superintendent for Senior Staff and Group Leaders) are responsible for the training and qualification of personnel in their group, including, but not limited to:

5.1.2.1 providing personnel with qualification information, guidance, and support, including time necessary to pursue qualification activities.
5.1.2.2 coordinating the self-study portions of the qualification process with respective Mentors.
5.1.2.3 reviewing and verifying periodically with both the Candidates and the Mentors the checked off items of the Candidate's proficiencies leading to NCSD qualifications.
5.1.2.4 serving on oral qualification boards.
5.1.2.5 recommending the qualification of each of the NCSD Candidates at the completion of required training.
5.1.2.6 recommending the removal of qualification should such action be necessary and assisting in the development of any requalification program resulting from removal of qualification.
5.1.2.7 encouraging personnel to expand their NCS knowledge, skills, and abilities to enhance their current and future job performances.
5.1.2.8 encouraging personnel to pursue education, training, and activities for their individual professional development.

5.1.3 NCSD Staff

Each member of the NCSD organization is responsible for attaining the knowledge, skills, and abilities necessary to perform their assigned duties, including, but not limited to:

5.1.3.1 completing the qualification process and obtaining required signatures.
5.1.3.2 cooperating with the QVO in the validation of the NCSD qualifications.
5.1.3.3 attending professional training as assigned.
5.1.3.4 attending compliance training as assigned.
5.1.3.5 continuing professional development by participating in courses, seminars, workshops, and/or professional activities in a job-related NCS field which supports and/or enhances professional qualification status, as assigned.
5.1.3.6 serving on oral qualification boards.

5.2 Training Positions

5.2.1 Qualification Verification Official

The QVO is appointed by the Department Superintendent and provides overall guidance to the professional development program, including, but not limited to:

5.2.1.1 verifying the qualification of each of the NCSD Candidates at the completion of required training.
5.2.1.2 approving the NCS knowledge, skills, and abilities (KSAs) NCSD Candidates require to qualify for NCS tasks and programs.
5.2.1.3 verifying that the necessary requirements for each NCSD task are included in the NCSD qualification program.
5.2.1.4 reviewing the professional qualification criteria and modifying as appropriate to correspond with approved changes in regulations, orders, standards, processes, and/or procedures.
5.2.1.5 reviewing training courses, materials used, instructor qualifications, course deliveries, and other pertinent aspects of the NCSD professional qualification process.
5.2.1.6 serving on the oral qualification boards.
5.2.1.7 recommending the removal of qualification should such action be necessary and assisting in the development of any requalification program resulting from removal of qualification for reasons of unsatisfactory performance.
5.2.1.8 maintaining a working knowledge of and familiarity with laws, orders, standards, and other requirements affecting NCS training, to assure that required program changes are implemented.

5.2.2 Mentors

Mentors play a crucial role in the training process, discussing and signing-off individual checksheet items. General guidance to Mentors is provided in Attachment D. Prior to performing as a Mentor, the Mentor Self-Study Record shall be completed and placed in the NCSD training files. Mentors responsibilities include, but are not limited to:

5.2.2.1 conveying to Candidates relevant information about adequate performance of NCS tasks.
5.2.2.2 relating to Candidates background and current information about the plant processes, facilities, and/or operations where NCS concerns and issues may exist.
5.2.2.3 assessing NCSD Candidate's proficiencies in the KSAs necessary to perform adequately the NCS tasks.
5.2.2.4 assuring that the Candidates know and follow established procedures.

5.2.3 Training Coordinator

The Training Coordinator provides day-to-day administration of the training program, including, but not limited to:

5.2.3.1 maintaining a working knowledge of and familiarity with laws, orders, standards, and other requirements affecting NCS training, assisting the QVO in implementation of program changes as required.
5.2.3.2 assisting in the development of required NCS training materials.
5.2.3.3 coordinating training activities, including off-site professional training.
5.2.3.4 evaluating periodically the progress of the NCSD Candidates in their qualification process.
5.2.3.5 notifying group leaders of maintenance of qualification training required.
5.2.3.6 maintaining qualification program files.
5.2.3.7 maintaining the List of Qualified Personnel.
5.2.3.8 assisting the QVO in evaluation of training effectiveness
5.2.3.9 maintaining lists of available, appropriate courses for NCSD personnel.

6.0 TRAINING AND QUALIFICATION DOCUMENTATION

6.1 Training Management System Programs

6.1.1 TMS Qualification Programs document the training 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 which are described in Y/DD-694, *Qualification Program. Nuclear Criticality Safety Department.*

6.1.2 Example TMS programs are provided as Attachment A. Record copies with approval signatures are maintained in the NCSD training records. Records which document the analysis, design, development, implementation and evaluation of training programs are also maintained in the NCSD training records.

6.2 Mentoring Checklists

6.2.1 Mentoring Checklists list specific performance steps needed to complete an element of the TMS programs and provide a means to document performance of the steps. Five Mentoring Checklists are provided for NCSD personnel: NCS Engineer in Training, NCS Engineer, NCS Specialist, Technical Specialist, and NCS Engineer Requalification.

6.2.2 Example Mentoring checklists are provided as Attachment B. Record copies with approval signatures are maintained in the NCSD training records. The checklists are held by the Training Coordinator until complete at which point they become part of the LMES and NCSD individual training records to document completion of a particular program. Checklists shall be developed or approved by a LMES qualified instructor.

6.3 Mentoring Checksheets

6.3.1 Mentoring Checksheets provide amplification of the requirements to be met to sign off selected items in the Mentoring Checklists. They provide a set of performance standards which detail the KSAs required for the various tasks outlined on the checklists.

6.3.2 Mentoring Checksheets are provided for the technical tasks in the Mentoring Checklists. Mentoring Checksheets are provided for

6.3.2.1 Basic theory and practice knowledge (3 checksheets)
6.3.2.2 Basic document Knowledge
6.3.2.3 Basic facility knowledge
6.3.2.4 Task 1 - External Monitoring
6.3.2.5 Task 2 - NCS Evaluation and Documentation
6.3.2.6 Task 3 - Operating Procedure Approval
6.3.2.7 Task 4 - NCS Computation
6.3.2.8 Task 5 - NCS Computation Review
6.3.2.9 Task 6 - NCS Evaluation and Documentation Review
6.3.2.10 Task 7 - Emergency Response Planning
6.3.2.11 Task 8 - Criticality Accident Alarm System Support
6.3.2.12 Task 9 - Order Compliance and NCS Procedures
6.3.2.13 Task 10 - Independent Technical Review Board
6.3.2.14 Task 11 - Final NCS Technical Documentation Approval
6.3.2.15 Task 12 - NCS Program Oversight
6.3.2.16 Task 13 - Emergency Operations Center Support

6.3.3 Some checksheets refer to problem sets which are to be completed as part of the qualification process. Problem sets and answer keys are maintained by the TC in the NCSD training program files until needed.

6.3.4 Examples of the Mentoring Checksheets are provided as Attachment C. Record copies with approval signature are maintained in the NCSD training records. The checksheets are held by the Candidate until complete at which point they become part of the NCSD individual training record to document completion of a particular element of a qualification program. Checksheets shall be developed or approved by a LMES qualified instructor.

6.4 Task Qualification Record

6.4.1 The Task Qualification Record is used to document qualification in a specific task activity to allow a Candidate to independently perform that activity while in training for an overall qualification program.

6.4.2 An example of the Task Qualification Record is provided in Attachment D. The record copy with approval signature is maintained in the NCSD training records. After completion to document task qualification it becomes part of the NCSD individual training records.

6.5 Experienced Personnel Evaluation Form

6.5.1 The Experienced Personnel Evaluation Form is used to document the actions of the board assembled to review existing qualifications and KSAs of experienced personnel and modify the training requirements accordingly.

6.5.2 An example of the Experienced Personnel Evaluation Form is provided in Attachment D. The record copy with approval signature is maintained in the NCSD training records. Completed forms are maintained in the NCSD training records. Note that a request for exception may also be needed; additional details are provided in Y90-020.

6.6 Oral Board Records

6.6.1 Oral boards are required for qualification in programs above the NCS Engineer in Training level and for Tasks 5 and 6. When required, the conduct of the oral board shall be governed by the Evaluator Guide for Oral Qualification Boards and results documented on the Oral Qualification Board Report.

6.6.2 The Evaluator Guide for Oral Qualification Boards provides instructions to the board members addressing the conduct of the oral board. It is general in nature in that the technical questions to be asked during the oral board are not specified. Prior to conducting an oral board, the board members should meet to generate a list of topics to be addressed during the board.

6.6.3 The Oral Qualification Board Report is used to document the results of the oral board. Questions asked during the board and the board's evaluation of the Candidate's response are recorded on this form along with the board's overall pass/fail evaluation and weaknesses noted.

6.6.4 Examples of the Evaluator Guide for Oral Qualification Boards and the Oral Qualification Board Report are provided in Attachment D. The record copies with approval signature are maintained in the NCSD training records. Completed Oral Qualification Board Reports are maintained in the LMES and NCSD individual training records.

6.7 Continuing Technical Training Plan and Record, and Recurring Training Planning

6.7.1 Continuing technical training and recurring training are the technical portions of the continuing training program. They are described in detain in Y/DD-710, *Guidance for the Development of Continuing Technical Training, Nuclear Criticality Safety Department*. The Continuing Technical Training Plan is used to document selection of the method for NCSD continuing technical training. The Continuing Technical Training Record is used to document completion of NCSD continuing technical training. The Recurring Training Planning form is used to document the selection and approval of topics selected for recurring training. An example of the forms is provided in Attachment D.

6.7.2 Required reading and meeting attendance forms supporting the individual Continuing Technical Training Records are maintained in the NCSD program files.

6.8 List of Qualified Personnel (Y/DD-587)

6.8.1 The List of Qualified Personnel provides tabulations of the qualification status of NCSD staff and sub-contractors on the various programs and tasks.

6.8.2 An example of the List of Qualified Personnel is provided in Attachment D. The completed copy with approval signature is maintained in the NCSD training records.

6.9 Training records

6.9.1 Qualification program records, including the approved TMS Programs, Checklists, Checksheets, the Task Qualification Record, the Experienced Personnel Evaluation Form, the Evaluator Guide for Oral Qualification Boards, the Oral Qualification Board Report, Continuing Technical Training Record, and the List of Qualified Personnel shall be maintained in the NCSD records along with documentation addressing the analysis, design, development, and periodic audits and assessments of the program.

6.9.2 Training records documenting individual qualifications shall be maintained in both the LMES training records center (the permanent record) and individual training records at the department level. The LMES system documents completed training and qualification for TMS Programs. The NCSD records are used to store individual task qualification and may be used to store ongoing as well as completed training. Additional details are found in Y90-030.

6.9.3 NCSD technical and managerial personnel who are entered in a qualification program shall have an LMES training record and a department training record. The Training Coordinator shall forward completed training documents to the central LMES TRC for inclusion into the central training record and/or file the document in the individual's department training record.

6.9.4 Records in the LMES individual training record shall include

6.9.4.1 Education, Experience and Medical Qualification records
6.9.4.2 Evidence of completion of LMES training courses
6.9.4.3 Completed Mentoring checklists and requests for exception (original)
6.9.4.4 Completed qualification cards (original)
6.9.4.5 Completed Oral Qualification Board Reports (original)
6.9.4.6 Completed IDPs (original)
6.9.4.7 Evidence of completion of off-site training courses

6.9.5 Records in the department training records shall include

6.9.5.1 Program Files

6.9.5.1.1	Analysis, design, and development records
6.9.5.1.2	Approved TMS Programs (original)
6.9.5.1.3	Approved Mentoring Checksheets (original)
6.9.5.1.4	Approved Mentoring Checklists (original)
6.9.5.1.5	Approved Task Qualification Record (original)
6.9.5.1.6	Approved Experienced Personnel Evaluation Form (original)
6.9.5.1.7	Approved Evaluator Guide for Oral Qualification Boards (original)
6.9.5.1.8	Approved Oral Qualification Board Report (original)
6.9.5.1.9	Active and Superseded List of Qualified Personnel
6.9.5.1.10	Results of program audits and self assessments including resolution of any findings
6.9.5.1.11	Problem Sets and Answer Keys
6.9.5.1.12	Required Reading and Meeting Attendance Sheets
6.9.5.1.13	Mentor Self-Study Records

6.9.5.2 Individual Files

6.9.5.2.1	Completed experienced personnel evaluations (copy)
6.9.5.2.2	Completed Mentoring checksheets (original)
6.9.5.2.3	Completed task qualification records (original)
6.9.5.2.4	Active Mentoring checklists (copy)
6.9.5.2.5	Completed Mentoring checklists (copy)
6.9.5.2.6	Completed qualification cards (copy)
6.9.5.2.7	Active Individual Development Plans (copy)
6.9.5.2.8	Completed Oral Qualification Board Reports (copy)
6.9.5.2.9	Completed Individual Development Plans (copy)
6.9.5.2.10	Evidence of completion of off-site training courses
6.9.5.2.11	Evidence of completion of Continuing Technical Training
6.9.5.2.12	Evidence of completion of education/experience

7.0 CHANGES AND REVISIONS TO TRAINING AND QUALIFICATION DOCUMENTATION

7.1 Record copies, both active and superseded, of TMS Programs with approval signatures are maintained in the NCSD training records.

7.1.1 Should a TMS Program require revision, the QVO shall initiate the revision in accordance with Y90-040 and obtain the required approval signatures. After approval, the TC shall replace the superseded TMS Program with the revision in the NCSD training program files and notify Candidates entered in the program of the change.

7.1.2 It is not necessary to revise the example TMS Programs in Attachment A of this document to use the revised TMS Program. A revision to this document incorporating the TMS Program revision may be delayed until the next normal revision.

7.2 Record copies, both active and superseded, of Checklists and Checksheets with approval signatures are maintained in the NCSD training records.

7.2.1 The QVO may initiate a revision to any checklist or checksheet at any time. After preparation, the revised checklist and checksheets shall be approved by the QVO.

7.2.2 After approval, the TC shall replace the superseded checklist and/or checksheets with the revision in the NCSD training program files and distribute revised copies to Candidates entered in the affected program.

7.2.3 It is not necessary to revise the example checklist and checksheets in Attachment B and C of this document to use the revised documents. A revision to this document incorporating the checklist and/or checksheet revision may be delayed until the next normal revision.

7.3 Record copies, both active and superseded, of the Task Qualification Record, the Experienced Personnel Evaluation Form, the Evaluator Guide for Oral Qualification Boards, the List of Qualified Personnel (Y/DD-587), and the Oral Qualification Board Report with approval signatures are maintained in the NCSD training records.

7.3.1 The QVO may initiate a revision to any of the forms at any time. After preparation, the revised form shall be approved by the QVO.

7.3.2 After approval, the TC shall replace the superseded form with the revision in the NCSD training program files.

7.3.3 It is not necessary to revise the example forms in Attachment D of this document to use the revised documents. A revision to this document incorporating the form revision may be delayed until next normal revision.

7.4 There are no backfit requirements associated with revisions to the training and qualification documents. Should a checklist or checksheet be partially completed at the time of revision, items already completed need not be resigned on the revised checklist or checksheet. Items completed after the revision shall be recorded on the revised document.

ATTACHMENT A - TMS PROGRAMS

Examples of the following TMS Programs are included in this Attachment:

TMS Program # 5939:	NCS Engineer in Training
TMS Program # 5764:	Technical Specialist
TMS Program # 5761:	NCS Engineer
TMS Program # 5762:	NCS Specialist
TMS Program # 5763:	NCS Superintendent
TMS Program # 5770:	Continuing Training, Technical Support Staff and Managers

Qualification Requirements List, NCS Engineer in Training
Initial Qualification
Y-12 Plant Nuclear Criticality Safety Department
TMS Program # 5939
Revision 2, 03/21/96

TMS Module No. or Documentation	Qualification Requirement
	Entry Level
17135	Evidence of Baccalaureate (Module 17135) in engineering or related science (diploma, transcript, or equivalent) on file in the NCSD training records.
	Job Fundamentals
9673	Energy System General Employee Rad Training (GERT)
4744	Energy Systems General Employee Hazard Communication (GET Hazcom)
4745	Energy Systems General Topics (GET)
1134	Computer Security
5724	Handling Classified Documents
10158	Free From the Influence-Employee Training
	Duty Area Access
	NCS Engineer in Training - Job Specific
14666	NCS Engineer In Training Mentoring Checklist

*At the time this document was published, a TMS Module No. did not exist for these requirements.

_____ __/__/__
HSEA Training Manager Date

_____ __/__/__
Qualification Verification Official Date

_____ __/__/__
NCS Superintendent Date

_____ __/__/__
HSEA Organization Manager Date

Qualification Requirements List, Technical Specialist
Initial Qualification
Y-12 Plant Nuclear Criticality Safety Department
TMS Program # 5764
Revision 2, 03/15/96

TMS Module No. or Documentation	Qualification Requirement
	Entry Level
Program 5939	Evidence of qualification as Engineer In Training (Program 5939) on file in the NCSD training records.
	Job Fundamentals
9673	Energy System General Employee Rad Training (GERT)
4744	Energy Systems General Employee Hazard Communication (GET Hazcom)
4745	Energy Systems General Topics (GET)
1134	Computer Security
5724	Handling Classified Documents
10158	Free From the Influence-Employee Training
	Duty Area Access
	Optional Program 5765 may be assigned for respirator wearers: 3021 F-F Fit Test, 3025 Respirator Training for Supv, 11539 Medical Exam - Respirator. Additional modules may be assigned to individuals as needed.
11536	Medical Exam - PSAP
9727/3257	Aberrant Behavior, Video or Presentation
11658	Personnel Security Assurance Program Orientation Video
1613/1302 or 0119/8863	NCS for Fissionable Material Worker/NCS for Y-12 Fissionable Material Worker NCS for Supervisors/NCS for Y-12 Supervisors
956	Radiological Worker II (DOE Core, Y-12 Specific)
	Technical Specialist
Optional	13932, Individual Development Plan, if appropriate
13953	Technical Specialist Mentoring Checklist
*	Evidence of two years job-related experience and one year nuclear experience on file in the NCSD training records. (Documented on Checklist # 13953)

*At the time this document was published, a TMS Module No. did not exist for these requirements.

Nuclear Criticality Safety Engineer
Initial Qualification
Y-12 Plant Nuclear Criticality Safety Department
TMS Program # 5761
Revision 4, 03/15/96

TMS Module No. or Documentation	Qualification Requirement
	Entry Level
Program 5939	Evidence of qualification as NCS Engineer In Training (Program 5939) on file in the NCSD training records.
	Job Fundamentals
9673	Energy System General Employee Rad Training (GERT)
4744	Energy Systems General Employee Hazard Communication (GET Hazcom)
4745	Energy Systems General Topics (GET)
10158	Drug Awareness (Free from the Influence)
5724	Handling Classified Documents
1134	Computer Security
	Duty Area Access
*	Optional Program 5765 may be assigned for respirator wearers: 3021 F-F Fit Test, 3025 Respirator Training for Supv, 11539 Medical Exam - Respirator. Additional modules may be assigned to individuals as needed.
11536	Medical Exam - PSAP
11658	Personnel Security Assurance Program Orientation Video
9727/3257	Aberrant Behavior, Video or Presentation
1613/1302 or 0119/8863	NCS for Fissionable Material Worker/NCS for Y-12 Fissionable Material Worker NCS for Supervisors/NCS for Y-12 Supervisors
956	Radiological Worker II (DOE Core, Y-12 Specific)
	NCS Engineer - Job Assignment Specific
13933	NCS Engineer Mentoring Checklist
*	Evidence of two years job-related, one year nuclear, and six months Y-12 nuclear criticality safety experience on file in the NCSD training records. (Documented on Checklist # 13933)

* At the time this document was published, a TMS Module No. did not exist for these requirements.

Nuclear Criticality Safety Specialist
Initial Qualification
Y-12 Plant Nuclear Criticality Safety Department
TMS Program # 5762
Revision 2, 03/15/96

TMS Module No. or Documentation	Qualification Requirement
	Entry Level
Program 5761	Evidence of qualification as NCS Engineer (Program 5761) on file in the NCSD training records.
	Job Fundamentals
9673	Energy System General Employee Rad Training (GERT)
4744	Energy Systems General Employee Hazard Communication (GET Hazcom)
4745	Energy Systems General Topics (GET)
10158	Drug Awareness (Free from the Influence)
5724	Handling Classified Documents
1134	Computer Security
	Duty Area Access
	Optional Program 5765 may be assigned for respirator wearers: 3021 F-F Fit Test, 3025 Respirator Training for Supv, 11539 Medical Exam - Respirator. Additional modules may be assigned to individuals as needed.
11536	Medical Exam - PSAP
11658	Personnel Security Assurance Program Orientation Video
9727/3257	Aberrant Behavior, Video or Presentation
1613/1302 or 0119/8863	NCS for Fissionable Meterial Worker/NCS for Y-12 Fissionable Material Worker NCS for Supervisors/NCS for Y-12 Supervisors
956	Radiological Worker II (DOE Core, Y-12 Specific)
	NCS Specialist - Job Assignment Specific
13952	NCS Specialist Mentoring Checklist
*	Evidence of four years job-related, three years nuclear criticality, and one year Y-12 nuclear criticality safety experience on file in the NCSD training records. (Documented on Checklist #13952).

*At the time this document was published, a TMS Module No. did not exist for these requirements.

Qualification Requirements List, Superintendent
Initial Qualification
Y-12 Plant Nuclear Criticality Safety Department
TMS Program # 5763
Revision 2, 03/21/96

TMS Module No. or Documentation	Qualification Requirement
	Entry Level
Program 6000	Baccalaureate (Module 14083) in engineering or related science + four years nuclear experience. Documented in Program 6000.
	Job Fundamentals
1134	Computer Security
5724	Handling Classified Documents
	Duty Area Access
3727/3257	Aberrant Behavior, Video or Presentation
3877	Personnel Security Assurance Program (PSAP)
11536	Medical Exam - PSAP
1613/1302 **or** 0119/8863	NCS for Fissionable Material Worker/NCS for Y-12 Fissionable Material Worker NCS for Supervisors/NCS for Y-12 Supervisors
956	Radiological Worker II (DOE Core, Y-12 Specific)
	NCSD Superintendent - Job Specific
Program 6000	HSEA Manager Qualification Requirements

*At the time this document was published, a TMS Module No. did not exist for these requirements.

HSEA Training Manager — Date

Qualification Verification Official (QVO) — Date

NCS Superintendent — Date

HSEA Organization Manager — Date

Nuclear Criticality Safety Department
Continuing Training Requirements for
Technical Support Staff
TMS Program # 5770
Revision 3, 08/20/96

TMS Module No. or Documentation	Qualification Requirement
	Fixed Requirements
9673	Energy System General Employee Rad Training (GERT)
4744	Energy Systems General Employee Hazard Communication (GET Hazcom)
4745	Energy Systems General Topics (GET)
13003	Annual Security Refresher
15860	Y-12 Site Emergency Preparedness
1134	Computer Security
6033	Handling Classified Documents, Refresher
11536	Medical Exam - PSAP
7549	PSAP Annual Review
Optional	Program 5765, Respirator for Supervisor Requirements
Optional	Program 5768, Manager/Supervisor Core Requirements
1613/1302 **or** 0119/8863	NCS for Fissionable Material Worker/NCS for Y-12 Fissionable Material Worker NCS for Supervisors/NCS for Y-12 Supervisors
956	Radiological Worker II (DOE Core, Y-12 Specific)
**17890	NCS Engineer Requalification
	Variable Requirements and Enhancements
Optional	13932, Individual Development Plan, if applicable
*	Operating experience, required reading, technical discussions, participation in facility drills, LMES or offsite courses for professional development, etc.
Optional	Training required for advancement to next level.

*At the time this document was published, a TMS Module No. did not exist for these requirements.
**Added to reflect changes to NCSD Qualification Program.

HSEA Training Manager _____ Date _____

Qualification Verification Official (QVO) _____ Date _____

NCS Superintendent _____ Date _____

HSEA Organization Manager _____ Date _____

ATTACHMENT B - MENTORING CHECKLISTS

Examples of the following mentoring checklists are included in this Attachment:

Checklist # 14666:	NCS Engineer in Training
Checklist # 13933:	NCS Engineer
Checklist # 13952:	NCS Specialist
Checklist # 13953:	Technical Specialist
Checklist # 17890:	NCS Engineer Requalification

NCS ENGINEER IN TRAINING MENTORING CHECKLIST TMS # 14666

Candidate:_____/_____ Group Leader:_____/_____
Name Badge Name Badge

Date Complete:	Activity:
____/____/____	Educational Requirements Evidence of Baccalaureate in engineering or related science (diploma, transcript, or equivalent) on file in the NCSD training records. Verified by:_____ Training Coordinator
____/____/____	Job Fundamentals Evidence of job fundamentals LMES training on file in the LMES training records. Verified by:_____ Training Coordinator
____/____/____	Basic theory and practice knowledge Read and demonstrate satisfactory knowledge of Nuclear Criticality Safety by R. A. Knief by completion of Basic Theory and Practice checksheets parts 1 - 3. Verified by:_____ Training Coordinator
____/____/____	Basic document knowledge Read and demonstrate satisfactory knowledge of selected codes, standards and site documents by completion of Basic Document Knowledge checksheet. Verified by:_____ Training Coordinator

Candidate:_____/_____ is recommended for qualification as NCS Engineer in Training.

Group Leader:_____/_____ Date:_____

This form is approved for use R. G. Taylor
QVO

NCS ENGINEER MENTORING CHECKLIST TMS # 13933

Candidate:_____/_____ Group Leader:_____/_____
Name Badge Name Badge

Date:	Activity:
____/____/____	Prior Qualification Requirements Evidence of qualification as NCS Engineer in Training on file in the NCSD training records. Verified by:_____ Training Coordinator
____/____/____	Experience Requirements Evidence of two years job-related, one year nuclear, and 6 months Y-12 nuclear criticality safety experience on file in the NCSD training records. Verified by:_____ Training Coordinator
____/____/____	Duty Area Access Evidence of duty area access LMES training on file in the TMS system. Verified by:_____ Training Coordinator
____/____/____	Basic facility knowledge Demonstrate a basic knowledge of operating area systems, documents and equipment by completion of Basic Facility Knowledge checksheet for all facilities in either the Metals or Solutions group. Group:_____ Verified by:_____ Training Coordinator
____/____/____	Task Qualification Demonstrate proficiency in the performance of external monitoring, NCS evaluation and documentation, operating procedure approval, and NCS computation by qualification in Tasks 1 - 4. Verified by:_____ Training Coordinator

NCS ENGINEER MENTORING CHECKLIST TMS # 13933 (Continued)

____/____/____ Oral Qualification Board

Evidence of satisfactorily completing an oral board on file in the NCSD training records.

Verified by:_____
Training Coordinator

Candidate:_____/_____ is recommended for qualification as NCS Engineer.

Group Leader:_____/_____ Date:_____

This form is approved for use R. G. Taylor
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NCS SPECIALIST MENTORING CHECKLIST TMS # 13952

Candidate:_____/_____ Group Leader:_____/_____
Name Badge Name Badge

Date: Activity:

____/____/____ Prior Qualification Requirements
Evidence of qualification as NCS Engineer on file in the NCSD training records.

Verified by:_____
Training Coordinator

____/____/____ Experience Requirements
Evidence of four years job-related. three years nuclear criticality safety, and one year Y-12 nuclear criticality safety experience on file in the NCSD training records.

Verified by:_____
Training Coordinator

____/____/____ Duty Area Access
Evidence that duty area access LMES training is current in the TMS system.

Verified by:_____
Training Coordinator

____/____/____ Basic facility knowledge
Demonstrate a basic knowledge of operating area systems, documents and equipment by completion of Basic Facility Knowledge checksheet for all Y-12 facilities.

Verified by:_____
Training Coordinator

____/____/____ Task Qualification
Demonstrate proficiency in the performance of NCS activities by qualification in Tasks 5 and 6 and any 2 additional tasks from Tasks 7 - 9.

Verified by:_____
Training Coordinator

NCS SPECIALIST MENTORING CHECKLIST TMS # 13952 (Continued)

____/____/____ Oral Qualification Board

Evidence of satisfactorily completing an oral board on file in the NCSD training records.

Verified by:_____
Training Coordinator

Candidate:_____/_____ is recommended for qualification as NCS Specialist.

Group Leader:_____/_____ Date:_____

This form is approved for use R. G. Taylor
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TECHNICAL SPECIALIST MENTORING CHECKLIST TMS # 13953

Candidate:_____/_____ Group Leader:_____/_____
Name Badge Name Badge

Date: Activity:

____/____/____ Prior Qualification Requirements
Evidence of qualification as NCS Engineer in Training on file in the NCSD training records.

Verified by:_____
Training Coordinator

____/____/____ Experience Requirements
Evidence of two years job-related and one year nuclear experience on file in the NCSD training records.

Verified by:_____
Training Coordinator

____/____/____ Duty Area Access
Evidence of duty area access LMES training on file in the TMS system.

NOTE: This is required only if qualified in Task 1 or 8.

Verified by:_____
Training Coordinator

____/____/____ Basic facility knowledge
Demonstrate a basic knowledge of operating area systems, documents and equipment by completion of Basic Facility Knowledge checksheet for any three Y-12 facilities.

NOTE: This is required only if qualified in Task 1.

Verified by:_____
Training Coordinator

____/____/____ Task Qualification
Demonstrate proficiency in the performance of NCS activities by qualification in any 3 tasks from Tasks 1 - 9.

Verified by:_____
Training Coordinator

TECHNICAL SPECIALIST MENTORING CHECKLIST TMS # 13953 (Continued)

____/____/____ Oral Qualification Board

Evidence of satisfactorily completing an oral board on file in the NCSD training records.

Verified by:_____
Training Coordinator

Candidate:_____/_____ is recommended for qualification as Technical Specialist.

Group Leader:_____/_____ Date:_____

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NCS ENGINEER REQUALIFICATION TMS # 17890

Candidate:_____/_____ Group Leader:_____/_____
Name Badge Name Badge

Rating Period:_____

Date: Activity:

____/____/____ Acceptable Job Performance
Performance rating of CM or higher achieved for technical activities over the rating period .

Verified by:_____
Group Leader

____/____/____ Completion of Required Reading
Evidence of completion of NCSD Required Reading over the rating period on file in the NCSD training records.

Verified by:_____
Required Reading Coordinator

____/____/____ Technical Discussion Meetings
Evidence of participation in or briefing on NCSD Technical Discussion Meetings over the rating period on file in the NCSD training records.

Verified by:_____
Training Coordinator

This form is approved for use R. G. Taylor
QAO

ATTACHMENT C - MENTORING CHECKSHEETS

Examples of the following mentoring checksheets are included in this attachment:

Basic theory and practice knowledge
Basic document Knowledge
Basic facility knowledge
Task 1 - External Monitoring
Task 2 - NCS Evaluation and Documentation
Task 3 - Operating Procedure Approval
Task 4 - NCS Computation
Task 5 - NCS Computation Review
Task 6 - NCS Evaluation and Documentation Review
Task 7 - Emergency Response Planning
Task 8 - Criticality Accident Alarm System Support
Task 9 - Order Compliance and NCS Procedures
Task 10 - Independent Technical Review Board
Task 11 - Final NCS Technical Documentation Approval
Task 12 - NCS Program Oversight
Task 13 - Emergency Operations Center Support

Nuclear Criticality Safety Mentoring Checksheet

for

Basic Theory and Practice Knowledge - Part 1

Candidate/badge: _____ Supervisor/badge: _____

Basic Instructions and Sign-off Criteria:

Item 1: Reading by Candidate. No sign-off required..

Item 2: Answers to the questions are provided in the NCSD Training files for mentor review. The questions are intended to expose the new NCS candidate to basic NCS concepts and hand calculation techniques. Any NCS Engineer , NCS Specialist, or Technical Specialist who has received mentor orientation may discuss and sign-off. The questions require qualitative and quantitative responses. Mentor sign-off of a question indicates:

The candidate has worked through all sections of the question and provided a written calculation/response
The candidate can describe how the results were obtained
Quantitative responses require reading values from graphs and selecting and using equations to calculate intermediate and final results. For quantitative questions:
- The correct graph, abscissa, and ordinate were used and values read within the range shown in the answer
- The correct expressions were used to calculate intermediate and final results, and the results themselves were consistent with those shown in the answer.

Qualitative responses paraphrase the answer

NOTE: If qualitative or quantitative responses do not meet the above, the mentor shall work through the portion in error with the candidate. There is no minimum percentage of correct answers required for sign-off. "Exposure" is satisfied by either a correct response or by working through the exercise with the mentor.
NOTE: Answers to some questions are still under development. Until complete, mentors shall base their evaluation of the "correctness" of the candidate's response on their experience with similar questions.

1. Read Chapter 2, Fundamentals, of "Nuclear Criticality Safety Theory and Practice" by R. A. Knief.

2. Work through Questions 1 through 4, attached, and discuss each with mentor. When working through Questions, show all work done to determine the answer and submit all work to your mentor for evaluation. Completed work may be placed in the Candidate's training records if desired, but it is not required to be retained.

QUESTION	DATE COMPLETED	MENTOR
1 (Rev _____)		
2 (Rev _____)		
3 (Rev _____)		
4 (Rev _____)		

This form is approved for use R. G. Taylor
QVO

Nuclear Criticality Safety Mentoring Checksheet

for

Basic Theory and Practice Knowledge - Part 2

Candidate/badge: _____ Supervisor/badge: _____

Basic Instructions and Sign-off Criteria:

Item 1: Reading by Candidate. No sign-off required..

Item 2: Answers to the questions are provided in the NCSD Training files for mentor review. The questions are intended to expose the new NCS candidate to basic NCS concepts and hand calculation techniques. Any NCS Engineer , NCS Specialist, or Technical Specialist who has received mentor orientation may discuss and sign-off. The questions require qualitative and quantitative responses. Mentor sign-off of a question indicates:

The candidate has worked through all sections of the question and provided a written calculation/response
The candidate can describe how the results were obtained
Quantitative responses require reading values from graphs and selecting and using equations to calculate intermediate and final results. For quantitative questions:

- The correct graph, abscissa, and ordinate were used and values read within the range shown in the answer
- The correct expressions were used to calculate intermediate and final results, and the results themselves were consistent with those shown in the answer.

Qualitative responses paraphrase the answer

NOTE: If qualitative or quantitative responses do not meet the above, the mentor shall work through the portion in error with the candidate. There is no minimum percentage of correct answers required for sign-off. "Exposure" is satisfied by either a correct response or by working through the exercise with the mentor.
NOTE: Answers to some questions are still under development. Until complete, mentors shall base their evaluation of the "correctness" of the candidate's response on their experience with similar questions.

1. Read Chapter 8, Hand Calculation Methods, Appendix C, Solid Angle Calculation, and Appendix D, Limiting Surface Density Calculation, of "Nuclear Criticality Safety Theory and Practice," by R. A. Knief.

2. Work through Questions 5 through 8, attached, and discuss each with mentor. When working through Questions, show all work done to determine the answer and submit all work to your mentor for evaluation. Completed work may be placed in the Candidate's training records if desired, but it is not required to be retained.

QUESTION	DATE COMPLETED	MENTOR
5 (Rev _____)		
6 (Rev _____)		
7 (Rev _____)		
8 (Rev _____)		

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QVO

Nuclear Criticality Safety Mentoring Checksheet

for

Basic Theory and Practice Knowledge - Part 3

Candidate/badge: _____ Supervisor/badge: _____

Basic Instructions and Sign-off Criteria:

Item 1: Mentor sign-off indicates that the Candidate can recall from memory all 9 parameters. Any NCS Engineer, NCS Specialist, or Technical Specialist who has received mentor orientation may discuss and sign-off.

Items 2 & 3: Answers to the questions are provided in the NCSD Training files for mentor review. The questions are intended to expose the new NCS candidate to basic NCS concepts as specified in DOE Orders and ANSI Standards. Mentor sign-off of a question indicates:

The candidate has worked through all sections of the question and provided a response. Responses paraphrase the answer.

NOTE: If a response does not meet the above, the mentor shall work through the portion in error with the candidate. There is no minimum percentage of correct answers required for sign-off. "Exposure" is satisfied by either a correct response or by working through the exercise with the mentor.
NOTE: Answers to some questions are still under development. Until complete, mentors shall base their evaluation of the "correctness" of the candidate's response on their experience with similar questions.

1. Read Chapter 10, Practices, of "Nuclear Criticality Safety Theory and Practice," by R. A. Knief. There are 9 parameters which can be controlled to accomplish nuclear criticality safety: (1) Mass; (2) Absorbers; (3) Geometry; (4) Interaction; (5) Concentration; (6) Moderation; (7) Enrichment; (8) Reflection; and (9) Volume. Be able to recall all 9 from memory and to describe each one. (NOTE: it may help recall to note that the leading letters of the parameters in the list above form the acronym "MAGIC MERV")

date discussed: _____ mentor: _____

2. After familiarization with DOE Order 5480.24, "Nuclear Criticality Safety," "Interpretive Guidance for DOE Order 5480.24, 'Nuclear Criticality Safety'," and ANSI/ANS-8.1-1983 (Reaffirmed 11/30/88), "Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors," paragraphs 1 through 4 (pages 1 to 4), discuss the items immediately below with mentor.

A. What is the basic principle used to determine whether or not a fissionable material activity is safe?

B. Are there any differences in the statement of the principle cited by 2.A. between DOE Order 5480.24 and ANSI/ANS-8.1-1983? If so, describe the differences.

C. According to ANSI/ANS-8.1-1983, the effective multiplication factor of a system containing fissionable material depends upon two factors. What are those two factors?

D. Both ANSI/ANS-8.1-1983 and DOE Order 5480.24 state that there is preferred parameter to be controlled to accomplish nuclear criticality safety. What is that parameter?

E. According to ANSI/ANS-8.1-1983, before a new operation with fissionable materials is begun or before an existing operation is changed what must occur?

F. DOE Order 5480.24 requires that six ANS-8 series Standards be followed. Be able to recall from memory the designation and subject of each standard: e.g., "ANSI/ANS-8.15, the special actinides standard.".

date discussed: _____ mentor: _____

3.After familiarization with ANSI/ANS-8.19, "Administrative Practices for Nuclear Criticality Safety", discuss the items immediately below with mentor.

A. The Standard states seven responsibilities for the nuclear criticality safety staff. Discuss each of them.

B. From a management perspective, what should the relationship of the nuclear criticality safety function be with the fissionable materials operations function?

C. Operating procedures can be supplemented by other aids. Identify at least one of the aids which can be used.

D. Are unannounced evacuation drills permitted?

date discussed: _____ mentor: _____

This form is approved for use R. G. Taylor
QVO

Nuclear Criticality Safety Engineer Mentoring Checksheet

for

Basic Document Knowledge

Candidate/badge: _____ Supervisor/badge: _____

Basic Instructions and Sign-off Criteria:

All Items: Sign-off indicates that the Candidate has raised any questions or issues resulting from the reading with the mentor and that the mentor has provided an answer to address the questions/issues raised. No specific documentation of the discussion is necessary, however, if the discussions indicate the need for a procedure revision, this should be noted in the appropriate document history file maintained by the Compliance Group. Except for item 3 (Group Leader sign-off), any NCS Engineer, NCS Specialist, or Technical Specialist who has received mentor orientation may discuss and sign-off.

1. Read the following NCS-related documents and discuss with mentor.

DOCUMENT	TITLE	REVISION	SECTION	COMPLETION
NUREG/CR-0095, ORNL/NUREG/CSD-6	Nuclear Safety Guide, TID-7016	Revision 2	Pages 1 - 11	Date: _____ Mentor: _____
NUREG/CR-0095, ORNL/NUREG/CSD-6 and DOE/NCT-04	Nuclear Safety Guide, TID-7016 A Review of Criticality Accidents	Revision 2	Pages 13 - 21 Pages 3 - 18	Date: _____ Mentor: _____
DOE Order 5480.19	Conduct of Operations		All	Date: _____ Mentor: _____
DOE Order 5480.24 and Interpretive Guidance for DOE Order 5480.24	Nuclear Criticality Safety		All	Date: _____ Mentor: _____
ANSI/ANS-8.1-1983 (Reaffirmed 11/30/88)	Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors		All	Date: _____ Mentor: _____
ANSI/ANS-8.3-1986, the Clarification of Paragraphs (1) 4.2, (2) 4.2.2, 4.4.3, 4.4.4, 4.5.3, 5.3, 5.7.1, and (3) 5.5, 4.2.2; and the Interpretation of Paragraph 5.2	Criticality Accident Alarm System		All	Date: _____ Mentor: _____
ANSI/ANS-8.19-1984 (Reaffirmed 8/29/89)	Administrative Practices for Nuclear Criticality Safety		All	Date: _____ Mentor: _____

DOCUMENT	TITLE	REVISION	SECTION	COMPLETION
ESS-CS-101	Nuclear Criticality Safety Program Elements	Rev: _____	All	Date: _____ Mentor: _____
ESS-CS-102	Nuclear Criticality Safety Approval	Rev: _____	All	Date: _____ Mentor: _____
ESS-CS-103	Nuclear Criticality Safety Calculations	Rev: _____	All	Date: _____ Mentor: _____
ESS-CS-104	Criticality Accident Alarm System (CAAS)	Rev: _____	All	Date: _____ Mentor: _____
Y10-189	Document Control	Rev: _____	All	Date: _____ Mentor: _____
Y70-150	Nuclear Criticality Safety	Rev: _____	All	Date: _____ Mentor: _____
Y70-151 PES/164/012291	Criticality Accident Alarm System. Alarm System Layout (Drawing)	Rev: _____ Rev: _____	All	Date: _____ Mentor: _____
Y70-159	Fissile Material Activity Identification, Marking, and Requirements Posting	Rev: _____	All	Date: _____ Mentor: _____
Y70-160	Criticality Safety Approval System	Rev: _____	All	Date: _____ Mentor: _____
Y50-66-CS-325	Nuclear Criticality Safety Analysis, Approval, and Control System	Rev: _____	All	Date: _____ Mentor: _____
Y50-66-CS-328	QA for Nuclear Criticality Safety Computer Calculations	Rev: _____	All	Date: _____ Mentor: _____
Y70-66-CS-327	Nuclear Criticality Safety Incidents and Deficiencies	Rev: _____	All	Date: _____ Mentor: _____
Y70-66-CS-330	Nuclear Criticality Safety External Monitoring	Rev: _____	All	Date: _____ Mentor: _____
Y70-66-CS-332	Criticality Safety Requirements Development, Review and Approval	Rev: _____	All	Date: _____ Mentor: _____
Y/DD-430	NCSD Quality Assurance Plan	Rev: _____	All	Date: _____ Mentor: _____
Y/DD-552	NCSD Self-Assessment Plan	Rev: _____	All	Date: _____ Mentor: _____
Y/DD-675	Charter for the NCS ITRB	Rev: _____	All	Date: _____ Mentor: _____
Y/DD-704	NCSD Administrative Guide	Rev: _____	All	Date: _____ Mentor: _____
Y/DD-708	NCS Guidelines for Fire Fighting	Rev: _____	All	Date: _____ Mentor: _____
Y/DD-716	Guidance for Performing Reviews of Procedures Controlling FMAs	Rev: _____	All	Date: _____ Mentor: _____
Y/DD-717	Annual Reviews of Non-continuing Operations FMAs	Rev: _____	All	Date: _____ Mentor: _____

DOCUMENT	TITLE	REVISION	SECTION	COMPLETION
Y/DD-724 (when issued)	NCS Guidance for STAs	Rev: _____	All	Date: _____ Mentor: _____

2. There is a Standing Order system implemented in the Nuclear Criticality Safety Department (NCSD). Read all the currently effective Standing Orders.

date completed: _____ mentor: _____

3. There is a Required Reading system implemented in the NCSD. Read any existing Required Readings specified by your Group Leader.

date completed: _____ Group Leader: _____

This form is approved for use R. L. Taylor
QVO

Nuclear Criticality Safety Mentoring Checksheet

for

Basic Facility Knowledge

Candidate/badge: _____ Supervisor/badge: _____

Basic Instructions and Sign-off Criteria:

Item 1: This item needs to be completed once. Sign-off indicates that the Candidate can recall all the basic rules. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 1 who has received mentor orientation may discuss and sign-off.

Items 2 & 3 (OSR): For the applicable facility, the Candidate locates the OSR, reads the OSR, and enters the OSR designator on the checksheet (or "None" if no OSR applies to the facility). Mentor sign-off indicates that the Candidate can recall the scope of the OSR and can recall corrective actions for violations of NCS-related OSR requirements. Verbatim recollection of the scope and actions is NOT required; general content knowledge is sufficient. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 2 who has received mentor orientation may discuss and sign-off.

Items 2 & 3 (Tour): Sign-off indicates that the Candidate has attended and successfully completed training for unescorted access required by the facility (if any) or that the Candidate has successfully completed a tour of the facility conducted by either the facility operating authority or a NCSD mentor. The tour should include a discussion of the major operations conducted in the facility and the location and function of major components and systems located in the facility at the discretion of the tour leader. The facility operating authority conducting the course, or the facility operating authority or NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 2 conducting the tour (as applicable) may sign-off.

1. Discuss the following basic rules for behavior in operating areas with mentor:

A. Obtain the concurrence of designated operating authority access control that it is permissible to enter operating area and inform them upon entry.

B. Do not take any non-business related materials or entertainment devices into operating areas.

C. Do not manipulate any process controls or do anything that could conceivably affect processes in the operating area.

D. Do not request an operating person to do anything to change process variables - these instructions properly come only from an operating person's supervision or management.

E. Inform designated operating authority access control upon exit from the operating area.

F. Remain with your escort at all times.

date discussed: _____ mentor: _____

2. Facility orientation for Metals functional area:

FACILITY	OSR DISCUSSION	FACILITY ORIENTATION COURSE OR TOUR
Building 9212: E-Wing Casting E-Wing Vaults E-Wing Packaging	OSR(s) _____ _____ _____ _____ _____ Date: _____ Mentor: _____	Date: _____ Mentor or Facility Rep: _____
Building 9215: M-Wing/H-2 Machining Enriched Uranium Transportation Operations (EUTO) H-2 Inspection O-Wing Third Mill	OSR(s): _____ _____ _____ _____ _____ Date: _____ Mentor: _____	Date: _____ Mentor or Facility Rep: _____
Buildings 9204-2/2E: Disassembly Room Nondestructive Testing (NDT) and Inspection Floor Operations and Storage	OSR(s): _____ _____ _____ _____ _____ Date: _____ Mentor: _____	Date: _____ Mentor or Facility Rep: _____
Building 9204-4: Quality Evaluation Laboratory / Reclamation Bonded Storage Basement Vault-type Room	OSR(s): _____ _____ _____ _____ _____ Date: _____ Mentor: _____	Date: _____ Mentor or Facility Rep: _____

FACILITY	OSR DISCUSSION	FACILITY ORIENTATION COURSE OR TOUR
Building 9720-5: Vaults Floor Operations	OSR(s):_____ _____ _____ _____ _____ Date:_____ Mentor:_____	Date:_____ Mentor or Facility Rep:_____

3. Facility orientation for Solutions/Waste/Lab functional area:

FACILITY	OSR DISCUSSION	FACILITY ORIENTATION COURSE OR TOUR
Building 9212: Special Process Rooms 1004 and 1010 Special Process Rooms 1021, 1022, and 1022A Headhouse Reduction B-1 Wing C-1 Wing D-Wing Storage, Non-SNM Door, and NDA	OSR(s):_____ _____ _____ _____ _____ Date:_____ Mentor:_____	Date:_____ Mentor or Facility Rep:_____
Building 9980 Quality Control Operations	OSR(s):_____ _____ _____ _____ _____ Date:_____ Mentor:_____	Date:_____ Mentor or Facility Rep:_____
Building 9818: Operating area and Tank Farm	OSR(s):_____ _____ _____ _____ _____ Date:_____ Mentor:_____	Date:_____ Mentor or Facility Rep:_____

FACILITY	OSR DISCUSSION	FACILITY ORIENTATION COURSE OR TOUR
Building 9206: Rooms 22 through 30, 37 and 100 Balance of MAA Non-MAA (Includes Satellite Storage Areas)	OSR(s): _____ _____ _____ _____ _____ Date: _____ Mentor: _____	Date: _____ Mentor or Facility Rep: _____
Building 9995: Receiving and Storage Salvage Security Control Zone (SCZ) Operations Non-SCZ Operations	OSR(s): None _____ _____ _____ _____ Date: _____ Mentor: _____	Date: _____ Mentor or Facility Rep: _____
Waste Treatment Operations WTO Central Pollution Facility, Building 9623 West End Treatment Facility, Building 9616-7 West Tank Farm	OSR(s): None _____ _____ _____ _____ Date: _____ Mentor: _____	Date: _____ Mentor or Facility Rep: _____
Waste Storage and Shipping Ops H-1 Salvage Yard Enriched Uranium Waste Storage, Building 9720-9 Containerized Waste Storage Area, Facility IS-33 Classified Waste Storage Facility, Building 9720-25 Above Grade Storage Facility Waste Feed Preparation Facility, Building 9401-4	OSR(s): None _____ _____ _____ _____ Date: _____ Mentor: _____	Date: _____ Mentor or Facility Rep: _____

This form is approved for use R. G. Taylor
QVO

Nuclear Criticality Safety Mentoring Checksheet

for

Task 1: External Monitoring

NOTE: This task previously identified as Task 3.

Candidate/badge: _____ Group Leader/badge: _____

Basic Instructions and Sign-off Criteria:

General: This checksheet is set up for qualification in one or more facilities and need be completed only once. The Basic Facility Knowledge checksheet is used to document and add, as applicable, the facilities for which this task qualification is valid.

Item 1: Sign-off indicates that evidence of NCS Engineer in Training qualification is in the NCSD training files. Verification of documentation may be made by the Training Coordinator.

Item 2: Applicable Duty Area Access training consists of NCS and Radworker II (core and site specific). Sign-off indicates that evidence of training is documented in the TMS system. Verification of documentation may be made by the Training Coordinator.

Item 3: Sign-off indicates that evidence of completion of the Basic Facility Knowledge checksheet is documented in the NCSD training files. Verification of documentation may be made by the Training Coordinator.

Item 4: Sign-off indicates that the Candidate has raised any questions or issues resulting from the reading with the mentor and that the mentor has provided an answer to address the questions/issues raised. No specific documentation of the discussion is necessary, however, if the discussions indicate the need for a procedure revision, this should be noted in the appropriate document history file maintained by the Compliance Group. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 1 who has received mentor orientation may discuss and sign-off.

Item 5: Sign-off indicates that the Candidate can recall from memory the listed information. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 1 who has received mentor orientation may discuss and sign-off.

Item 6: Sign-off indicates that the Candidate has observed the external monitoring activities. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 1 who performed the activity may sign-off.

Item 7: The external monitoring activities are conducted under the direct observation of the mentor, who will sign any official documentation as the responsible party. Sign-off indicates that the Candidate:

Conducted and documented the review or survey in accordance with the requirements of the governing NCSD procedure or other document.

Did not fail to identify any NCS Incidents or Deficiencies noted by the mentor during the review or survey. **Note that nuclear criticality safety is not to be sacrificed for training**. If a candidate fails to notice a NCS Incident or Deficiency, it is the mentor's responsibility to immediately take charge of the situation.

1. The Candidate is qualified as NCS Engineer in Training.

Verified by: _____ Date: _____

2. Required Duty Area Access training current.

Verified by: _____ Date: _____

3. Candidate has completed Basic Facility Knowledge requirements by completion of the Basic Facility Knowledge checksheet for the Facility to be observed.

Verified by: _____ Date: _____

4. Read the current NCSD procedure(s) and/or other instructions for performing external monitoring and for response to a potential NCS Incident or Deficiency and discuss with mentor.

Procedure/instruction	Revision	Date Discussed	Mentor
Y70-150			
Y70-66-CS-327			
Y70-66-CS-330			
Y/DD-717			
Y/DD-724			

5. Be able to recall from memory the initiator and the four step operating authority response shown immediately below.

A. Initiator: when a change in a fissile material activity or process condition is detected that deviates from the requirements specified in a CSA/CSR.

B. Response:

1. Make no immediate attempt to correct the situation.

2. IMMEDIATELY clear the area and keep personnel at least 15 feet from the subject process or operation.

3. IMMEDIATELY notify the Shift Technical Advisor (STA) or NCSD as appropriate. If contact cannot be established with the STA or NCSD, the Plant Shift Superintendent (PSS) should be contacted for assistance in reaching a member of the NCSD.

4. Provide details of the situation to the STA or NCSD personnel and perform actions directed by them as necessary to meet CSA requirements.

Verified by: _____ Date: _____

6. Observe the conduct of one external monitoring activity of each type (includes field and office activities and documentation of the observations). During periods when operations are limited, a second operational review of process conditions may be substituted for the operational review of procedure performance.

EXTERNAL MONITORING TYPE	REVIEW OR SURVEY DESIGNATOR	OBSERVATION
Operational Review of Process Conditions		Mentor: _____ Date: _____
Operational Review of Procedure Performance or Process Conditions		Mentor: _____ Date: _____
Area Survey		Mentor: _____ Date: _____

7. Under direct supervision, conduct and document one external monitoring activity of each type. During periods when operations are limited, a second operational review of process conditions may be substituted for the operational review of procedure performance.

EXTERNAL MONITORING TYPE	REVIEW OR SURVEY DESIGNATOR	PERFORMANCE
Operational Review of Process Conditions		Mentor: _____ Date: _____
Operational Review of Procedure Performance or Process Conditions		Mentor: _____ Date: _____
Area Survey		Mentor: _____ Date: _____

_____ is recommended for task qualification in External Monitoring
Candidate/badge

Recommended by: _____ Date: _____
Group Leader

This form is approved for use R. L. Taylor
QAO

Nuclear Criticality Safety Mentoring Checksheet

for

Task 2: NCS Evaluation and Documentation

NOTE: This task previously identified as Task 4.

Candidate/badge: _____ Group Leader/badge: _____

Basic Instructions and Sign-off Criteria:

Item 1: Sign-off indicates that evidence of Task 1 qualification is in the NCSD training files. Verification of documentation may be made by the Training Coordinator.

Item 2: Sign-off indicates that the Candidate has raised any questions or issues resulting from the reading with the mentor and that the mentor has provided an answer to address the questions/issues raised. No specific documentation of the discussion is necessary, however, if the discussions indicate the need for a procedure revision, this should be noted in the appropriate document history file maintained by the Compliance Group. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 2 who has received mentor orientation may discuss and sign-off.

Item 3: A CSA has three major components: request, evaluation, and approval. CSAs are currently in an evolutionary state and the training is intended to familiarize the candidate with what is expected as described by current procedures by comparing the expectation with what exists. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 2 who has received mentor orientation may discuss and sign-off. Sign-off indicates:

(Part A): For each heading in the request being reviewed, the candidate has identified what is required for procedure compliance and has described the differences between the requirements and what actually appears in the request, if any.
(Part B): The candidate has identified the evaluation elements required for procedure compliance and has described the differences between the requirements and what actually appears in the evaluation, if any.
(Part C): The candidate has identified the approval elements required for procedure compliance and has described the differences between the requirements and what actually appears in the approval, if any.

Item 4: A CSR is supported by an evaluation and Process Description. CSRs are new and the training is intended to familiarize the candidate with what is expected as described by current procedures by comparing the expectation with what exists. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 2 who has received mentor orientation may discuss and sign-off. Sign-off indicates:

(Part A): The candidate has identified the evaluation elements required for procedure compliance and has described the differences between the requirements and what actually appears in the evaluation, if any.
(Part B): The candidate has identified the requirement elements required for procedure compliance and has described the differences between the requirements and what actually appears in the CSR, if any.

Item 5: Sign-off indicates that the Candidate has performed either the CSA request review, NCS evaluation, and CSA approval activities or the CSE/ICSE/CSR process as described in the governing documents. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 2 who has received mentor orientation may discuss and sign-off. Sign-off indicates:

A. All parameters correctly identified in the NCS evaluation
B. All controls correctly identified and discussed in the NCS evaluation
C. All contingencies correctly identified in the NCS evaluation
D. All contingencies correctly analyzed in the NCS evaluation
E. CSA approval or CSR complete and correctly stated
F. No major discrepancies found by the independent reviewer

1. Qualified in Task 1: External Monitoring.

Verified by: _____ Date: _____

2. Read the current Y-12 Plant level and NCSD procedures describing the Criticality Safety Evaluation and Documentation (CSA/CSR) system and any currently approved management plans or NCSD Standing Orders which specify requirements for CSAs/CSRs and discuss with mentor.

Procedure/instruction	Revision	Date Discussed	Mentor
ESS-CS-102			
Y70-160			
Y50-66-CS-325			
Y70-66-CS-332			
Y/DD-669			
Y/DD-675			
Y/DD-683			

3. Review two CSAs and their supporting Nuclear Criticality Safety (NCS) evaluations selected by the mentor.

A. Perform a comparison of the CSA request with the instructions and requirements found in the applicable procedures, management plans, and/or NCSD Standing Orders and discuss findings with mentor.

B. Perform a comparison of the NCS evaluation supporting the CSA with the instructions found in the applicable procedures, management plans, and/or NCSD Standing Orders and discuss findings with mentor.

C. Perform a comparison of the CSA approval with the instructions found in the applicable procedures, management plans, and/or NCSD Standing Orders and discuss findings with mentor.

PART A REVIEW	PART B REVIEW	PART C REVIEW
CSA: _____ Mentor: _____ Date: _____	CSA: _____ Mentor: _____ Date: _____	CSA: _____ Mentor: _____ Date: _____
CSA: _____ Mentor: _____ Date: _____	CSA: _____ Mentor: _____ Date: _____	CSA: _____ Mentor: _____ Date: _____

4. Review one CSR and its supporting Nuclear Criticality Safety (NCS) evaluation and Process Description selected by the mentor.

A. Perform a comparison of the NCS evaluation (CSE or ICSE) supporting the CSR with the instructions found in the applicable procedures, management plans, and/or NCSD Standing Orders and discuss findings with mentor..

B. Perform a comparison of the CSR with the instructions found in the applicable procedures, management plans, and/or NCSD Standing Orders and discuss findings with mentor.

PART A REVIEW	PART B REVIEW
CSR: _____ Mentor: _____ Date: _____	CSR: _____ Mentor: _____ Date: _____

5. Successfully perform either the CSA request review, NCS evaluation, and CSA approval for 3 CSAs or the Process Description review, NCS evaluation, and CSR approval for 1 CSE/ICSE/CSR specified by the mentor. These CSAs/CSR may be either new or revised so long as the documents are produced in accordance with the applicable procedures, management plans, and/or NCSD Standing Orders.

CSA/CSR	GOVERNING PROCEDURE	PERFORMANCE
		Mentor: _____ Date: _____
		Mentor: _____ Date: _____
		Mentor: _____ Date: _____

_____ is recommended for task qualification in NCS Evaluation and CSA Documentation
Candidate/badge

Recommended by: _____ Date: _____
Group Leader

This form is approved for use R. L. Taylor
QAO

Nuclear Criticality Safety Mentoring Checksheet

for

Task 3: Operating Procedure Approval

NOTE: This task previously identified as Task 6.

Candidate/badge: _____ Group Leader/badge: _____

Basic Instructions and Sign-off Criteria:

Item 1: Sign-off indicates that evidence of Task 1 qualification is in the NCSD training files. Verification of documentation may be made by the Training Coordinator.

Item 2: Sign-off indicates that evidence of Task 2 qualification is in the NCSD training files **OR** evidence of three Operational Reviews of Process Conditions is in the External Monitoring files. Verification of documentation may be made by the Training Coordinator.

Item 3: Sign-off indicates that the Candidate has raised any questions or issues resulting from the reading with the mentor and that the mentor has provided an answer to address the questions/issues raised. No specific documentation of the discussion is necessary, however, if the discussions indicate the need for a procedure revision, this should be noted in the appropriate document history file maintained by the Compliance Group. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 3 who has received mentor orientation may discuss and sign-off.

Item 4: A total of 3 problems need to be completed. The problems may be from the problem set, actual production procedure reviews, or a combination of both. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 3 who has received mentor orientation may review the computation reviews and sign-off.

Problem Set: The problem set and answers are under development at this time. Detailed requirements and sign-off criteria will be issued at a later date. In the interim, sign-off indicates that the candidate has identified all errors identified by the mentor during an independent review of the problem.

Production work: If actual production procedure reviews are utilized, then the following shall apply:

1. Each production procedure review to be used shall, in the judgement of the mentor and the Group Leader, be of reasonable complexity and sufficiently different from other production procedure reviews used.

2. The procedure review work shall be done under the direction of the mentor who will be considered responsible for the result. The mentor shall sign any documentation required as the responsible party.

3. The review work shall be considered satisfactory as long as:

The official procedure review, when compared to the candidate's review, did not uncover any non-conservative problems which were not noted in the candidate's review.

The candidate's review, when compared to the official review, did not incorrectly identify any problems which, if incorporated, would result in a non-conservative result.

1. Qualified in Task 1: External Monitoring.

Verified by: _____ Date: _____

2. Qualified in Task 2: NCS Analysis and Documentation **OR** perform 3 Operational Reviews of Process Conditions.

Operational Review Numbers (if applicable): _____ _____ _____

Verified by: _____ Date: _____

3. Read the current Y-12 Plant level and NCSD procedures describing the technical procedure process and discuss with mentor.

Procedure/instruction	Revision	Date Discussed	Mentor
Y10-102			
Y10-103			
Y/DD-716			
Y70-66-CS-332			

4. Three operating procedures and the associated CSAs/CSRs specifying the nuclear criticality safety limits and conditions for those procedures will be selected by the mentor from the problem set. Each procedure contains errors which can be found by careful comparison of the procedure with the associated CSAs/CSRs. The errors may be of commission (a limit or condition improperly stated) or omission (a limit or condition missing). Examine the documents provided, successfully identify all the errors, and review with mentor. Alternatively, actual operating procedures and their associated CSAs/CSRs assigned by the Group Leader and performed under the supervision of the mentor may be substituted for any or all of the problem set. If actual operating procedures are used, they may or may not contain errors.

OPERATING PROCEDURE	APPLICABLE CSAs/CSRs	COMPLETION
		Mentor: _____ Date: _____
		Mentor: _____ Date: _____
		Mentor: _____ Date: _____

_____ is recommended for task qualification in Operating Procedure Approval Candidate/badge

Recommended by: _____ Date: _____
Group Leader

This form is approved for use R. G. Taylor
QWO

Nuclear Criticality Safety Mentoring Checksheet

for

Task 4: NCS Computations

NOTE: This task previously identified as Task 1.

Candidate/badge: _____ Group Leader/badge: _____

Computer Code(s):_____

Basic Instructions and Sign-off Criteria:

General: This checksheet is set up for qualification on up to two codes. If qualifying on more than two codes, or to add additional codes to an existing Task 4 qualification, complete the Task 4 Addendum.

Item 1: This item is necessary for initial task qualification only. Sign-off indicates that evidence of NCS Engineer in Training qualification is filed in the NCSD training files. Verification of documentation may be made by the Training Coordinator.

Item 2: This item is necessary for initial task qualification only. Sign-off indicates that the Candidate has raised any questions or issues resulting from the reading with the mentor and that the mentor has provided an answer to address the questions/issues raised. No specific documentation of the discussion is necessary, however, if the discussions indicate the need for a procedure revision, this should be noted in the appropriate document history file maintained by the Compliance Group. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 4 who has received mentor orientation may discuss and sign-off.

Item 3: Sign-off indicates that either course completion documentation is in the NCSD training files **OR** an analysis, report, paper, journal article, or other documentation of code usage has been discussed with the mentor. Computations used to satisfy this requirement must be different than those used for item 4. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 4 who has received mentor orientation may discuss and sign-off code usage. Verification of course documentation may be made by the Training Coordinator.

Item 4: For each code, a total of 4 problems need to be completed. The problems may be from the problem set, actual production computations, or a combination of both. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 4 who has received mentor orientation may review the computations and sign-off.

Problem Set: A. The candidate is to submit for examination of each Task 4 computational problem:

1. Working papers/sketches and any notes on assumptions, computational strategies, interpretation of output which were created as part of determining the input or

interpreting the output.

2. A copy of the input data listing for each case.

3. For cases which are part of a computational series, a copy of the complete output listing for one representative case (a computational series is one with some number of similar, related cases where only one parameter such as interstitial water moderator density in an array or the mass of a single unit changes from case to case).

4. For isolated cases which are not part of a computational series, a copy of the complete output listing for each case. (An isolated case is one which is unrelated to others such as the calculation of k_{eff} for a single specified unit. Individual validation cases are a good example of isolated cases.)

5. A results summary table showing the computed result for each case.

6. The data, (A.1 - A.5 above), may be submitted as hard copy or on a diskette as long as the information is retrievable (ASCII format) and complete.

B. The examiner is to:

1. Review each input data listing to check that it is proper for the case being computed.

2. Review each representative output listing to check:

a. that proper input was specified.
b. that the code functioned as expected.
c. that the proper answer was read.

3. Compare the results for each case shown in the submitted summary table with the results shown in the Training and Qualification Program Problem Solution for the Problem being examined. If any of the submitted summary table results appear suspicious as a result of the comparison, request the complete output listing for the case and check it per step B.2. A Monte Carlo code result will be considered suspicious if the candidate's $k_{eff} \pm 2\sigma$ does not overlap the Problem Solution $k_{eff} \pm 2\sigma$ for the same problem.

4. Discuss the results of Examination with the candidate.

C. If errors are found as a result of Examination, then the candidate must correct and resubmit corrected items for reexamination.

D. Training File Records - the results summary table showing the computed result for each case will be retained.

Production work: If actual production problems are utilized, then the following shall apply:

1. Each production problem or problem series to be used shall, in the judgement of the mentor and the Group Leader, be of reasonable complexity and sufficiently different from other production problems used (as an example, computation of the neutron multiplication factor of an unreflected metal sphere is not reasonably complex, but a computational series examining the neutron multiplication of a single, partially reflected unit containing solution at various concentrations may be considered reasonably complex).

2. The computational work shall be done under the direction of the mentor who will be considered responsible for the result. The mentor shall sign any documentation required as the responsible party.

3. The computational work shall be considered satisfactory as long as:

Review by the mentor indicates that B.1 and B.2 above are satisfied.
The review of the computation indicates acceptability.

4. Retention of the computational work in the training files is not required as long as the computation is retrievable elsewhere.

1. The Candidate is qualified as NCS Engineer in Training.

Verified by: _____ Date: _____

2. Read the current NCSD procedure(s) and/or other instructions for performing NCS computations and discuss with mentor.

Procedure/instruction	Revision	Date Discussed	Mentor
ESS-CS-103			
Y50-66-CS-328			
Y/DD-438			

3. Candidate has completed a course of instruction for using the computer code(s) **OR** has successfully used the code(s) to perform NCS calculations. Evidence of code usage may be an analysis, report, paper, journal article, or other documentation which contains sufficient information to use the code to reproduce the results shown therein.

CODE	COURSE COMPLETED	CODE USAGE
	Verified by: _____ Date: _____	Document: _____ Mentor: _____ Date: _____
	Verified by: _____ Date: _____	Document: _____ Mentor: _____ Date: _____

4. Use the code(s) identified above to successfully calculate 4 problems. These problems may be selected by the mentor from a problem set or they may be production computations assigned by the Group Leader and performed under the supervision of the mentor.

CODE	PROBLEM IDENTIFICATION	COMPLETION
	1.	Mentor: _____ Date: _____
	2.	Mentor: _____ Date: _____
	3.	Mentor: _____ Date: _____
	4.	Mentor: _____ Date: _____
	1.	Mentor: _____ Date: _____
	2.	Mentor: _____ Date: _____
	3.	Mentor: _____ Date: _____
	4.	Mentor: _____ Date: _____

_____ is recommended for task qualification in NCS Computations

Recommended by: _____ Date: _____
Group Leader

Task 4 Addendum: Additional Codes for NCS Computations

Candidate/badge: _____ Computer Code(s):_____

Candidate has completed a course of instruction for using the computer code(s) **OR** has successfully used the code(s) to perform NCS calculations. Evidence of code usage may be an analysis, report, paper, journal article, or other documentation which contains sufficient information to use the code to reproduce the results shown therein.

CODE	COURSE COMPLETED	CODE USAGE
	Verified by: _____ Date: _____	Document: _____ Mentor: _____ Date: _____
	Verified by: _____ Date: _____	Document: _____ Mentor: _____ Date: _____

Use the code(s) identified above to successfully calculate 4 problems. These problems may be selected by the mentor from a problem set or they may be production computations assigned by the Group Leader and performed under the supervision of the mentor.

CODE	PROBLEM IDENTIFICATION	COMPLETION
	1.	Mentor: _____ Date: _____
	2.	Mentor: _____ Date: _____
	3.	Mentor: _____ Date: _____
	4.	Mentor: _____ Date: _____
	1.	Mentor: _____ Date: _____
	2.	Mentor: _____ Date: _____
	3.	Mentor: _____ Date: _____
	4.	Mentor: _____ Date: _____

This form is approved for use_____
QVO

Nuclear Criticality Safety Mentoring Checksheet

for

Task 5: NCS Computation Review

NOTE: This task previously identified as Task 2.

Candidate/badge: _____ Group Leader/badge: _____

Computer Code(s):_____

Basic Instructions and Sign-off Criteria:

General: This checksheet is set up for qualification on up to two codes. If qualifying on more than two codes, or to add additional codes to an existing Task 5 qualification, complete the Task 5 Addendum.

Item 1: Sign-off indicates that evidence of Task 4 qualification is filed in the NCSD training files. Verification of documentation may be made by the Training Coordinator.

Item 2: For each code, a total of 4 problems need to be completed. The problems may be from the problem set, actual production computation reviews, or a combination of both. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 5 who has received mentor orientation may review the computation reviews and sign-off.

Problem Set: The problem set and answers are under development at this time. Detailed requirements and sign-off criteria will be issued at a later date. In the interim, sign-off indicates that the candidate has identified all errors identified by the mentor during an independent review of the problem.

Production work: If actual production problems are utilized, then the following shall apply:

1. Each production problem or problem series to be used shall, in the judgement of the mentor and the Group Leader, be of reasonable complexity and sufficiently different from other production problems used (as an example, computation of the neutron multiplication factor of an unreflected metal sphere is not reasonably complex, but a computational series examining the neutron multiplication of a single, partially reflected unit containing solution at various concentrations may be considered reasonably complex).

2. The computational work shall be done under the direction of the mentor who will be considered responsible for the result. The mentor shall sign any documentation required as the responsible party.

3. The computational work shall be considered satisfactory as long as:

The official review of the computation, when compared to the candidate's review, did not uncover any non-conservative problems which were not noted in the candidate's review; and
The candidate's review of the computation, when compared to the official peer review, did not incorrectly identify any problems which, if incorporated, would result in a non-conservative computation result.

4. Retention of the computational work in the training files is not required as long as the computation is retrievable elsewhere.

Item 3: Signoff indicates that evidence of satisfactory completion of an oral qualification board is filed in the NCSD training files. Verification of documentation may be made by the Training Coordinator.

1. Qualified in Task 4: NCS Computations for the code(s) listed above.

Verified by: _____ Date: _____

2. Four problem descriptions and the associated computation output will be selected by the mentor from the problem set. The output provided contains errors. Using the problem description and the output, successfully locate and describe the errors. Alternatively, review of production computations under the supervision of the mentor may be substituted for the problem set exercises.

CODE	PROBLEM IDENTIFICATION	COMPLETION
	1.	Mentor: _____ Date: _____
	2.	Mentor: _____ Date: _____
	3.	Mentor: _____ Date: _____
	4.	Mentor: _____ Date: _____
	1.	Mentor: _____ Date: _____
	2.	Mentor: _____ Date: _____
	3.	Mentor: _____ Date: _____
	4.	Mentor: _____ Date: _____

3. Satisfactory completion of an oral qualification board for NCS Computation Review.

Verified by: _____ Date: _____

_____ is recommended for task qualification in NCS Computation Review.

Recommended by: _____ Date: _____
Group Leader

Task 5 Addendum: Additional Codes for NCS Computation Review

Candidate/badge: _____ Computer Code(s):_____

Qualified in Task 4: NCS Computations for the code(s) listed above.

Verified by: _____ Date: _____

Four problem descriptions and the associated computation output will be selected by the mentor from the problem set. The output provided contains errors. Using the problem description and the output, successfully locate and describe the errors. Alternatively, review of production computations under the supervision of the mentor may be substituted for the problem set exercises.

CODE	PROBLEM IDENTIFICATION	COMPLETION
	1.	Mentor: _____ Date: _____
	2.	Mentor: _____ Date: _____
	3.	Mentor: _____ Date: _____
	4.	Mentor: _____ Date: _____
	1.	Mentor: _____ Date: _____
	2.	Mentor: _____ Date: _____
	3.	Mentor: _____ Date: _____
	4.	Mentor: _____ Date: _____

This form is approved for use R. L. Taylor
QVO

Nuclear Criticality Safety Mentoring Checksheet

for

Task 6: NCS Evaluation and Documentation Review

NOTE: This task previously identified as Task 5.

Candidate/badge: _____ Group Leader/badge: _____

Basic Instructions and Sign-off Criteria:

Item 1: Sign-off indicates that evidence of Task 2 qualification is in the NCSD training files. Verification of documentation may be made by the Training Coordinator.

Item 2: A total of 3 problems need to be completed. The problems may be from the problem set, actual production NCS evaluation and CSA/CSR reviews, or a combination of both. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 6 who has received mentor orientation may review the NCS evaluation and CSA/CSR reviews and sign-off.

Problem Set: The problem set and answers are under development at this time. Detailed requirements and sign-off criteria will be issued at a later date. In the interim, sign-off indicates that the candidate has identified all errors identified by the mentor during an independent review of the problem.

Production work: If actual production problems are utilized, then the following shall apply:

1. Each production NCS evaluation and CSA/CSR review to be used shall, in the judgement of the mentor and the Group Leader, be of reasonable complexity and sufficiently different from other production problems used.

2. The NCS evaluation and CSA/CSR review shall be done under the direction of the mentor who will be considered responsible for the result. The mentor shall sign any documentation required as the responsible party.

3. The NCS evaluation and CSA/CSR review shall be considered satisfactory as long as:

The official review of the NCS evaluation and CSA/CSR, when compared to the candidate's review, did not uncover any non-conservative problems which were not noted in the candidate's review; and

The candidate's review of the NCS evaluation and CSA/CSR, when compared to the official review, did not incorrectly identify any problems which, if incorporated, would result in a non-conservative result.

Item 3: Sign-off indicates that the Candidate has raised any questions or issues resulting from the reading with the mentor and that the mentor has provided an answer to address the questions/issues raised. No specific documentation of the discussion is necessary, however, if the discussions indicate the need for a procedure revision. this should be noted in the appropriate document history file maintained by the Compliance Group. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 6 who has received mentor orientation may discuss and sign-off.

Item 4: Signoff indicates that evidence of satisfactory completion of an oral qualification board is filed in the NCSD training files. Verification of documentation may be made by the Training Coordinator.

1. Qualified in Task 2: NCS Evaluation and Documentation.

Verified by: _____ Date: _____

2. Three CSAs/CSRs and their associated analyses will be selected by the mentor from the problem set. Each CSA/CSR and evaluation contains errors which can be found by careful review. The errors may be of commission (an improper limit stated in a CSA/CSR or evaluation. for example) or omission (an unconsidered contingency, for example). Examine the documents provided, successfully identify all the errors, and review with mentor. Review of production CSAs/CSRs and their associated analyses assigned by the Group Leader and performed under the supervision of the mentor may be substituted for any or all of the problem set if desired. When production CSAs/CSRs and evaluations are used, the output may or may not contain errors.

CSA/CSR or PROBLEM	GOVERNING PROCEDURE	REVIEW
		Mentor: _____ Date: _____
		Mentor: _____ Date: _____
		Mentor: _____ Date: _____

3. Review all Independent Technical Review Board (ITRB) Monthly Lessons Learned Reports issued over the past year and discuss with mentor.

Verified by: _____ Date: _____

4. Satisfactory completion of an oral qualification board for NCS Evaluation and Documentation Review.

Verified by: _____ Date: _____

_____ is recommended for task qualification in NCS Evaluation and Documentation Review.

Recommended by: _____ Date: _____
Group Leader

This form is approved for use R. G. Taylor
QVO

Nuclear Criticality Safety Mentoring Checksheet

for

Task 7: Emergency Response Planning

Candidate/badge: _____ Group Leader/badge: _____

Basic Instructions and Sign-off Criteria:

Item 1: Sign-off indicates that evidence of qualification as NCS Engineer in Training is in the NCSD training files. Verification of documentation may be made by the Training Coordinator.

Item 2: Sign-off indicates that evidence of qualification as an Assembly Station Director is in the TMS system. Verification of documentation may be made by the Training Coordinator.

Item 3: Sign-off indicates that the Candidate has raised any questions or issues resulting from the reading with the mentor and that the mentor has provided an answer to address the questions/issues raised. No specific documentation of the discussion is necessary, however, if the discussions indicate the need for a procedure revision, this should be noted in the appropriate document history file maintained by the Compliance Group. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 7 who has received mentor orientation may discuss and sign-off.

Item 4: Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 7 who has received mentor orientation may discuss and sign-off. Sign-off indicates that the candidate can discuss from memory:

A description of the accident including cause, effects, and mitigating factors
A description of the automated and operator responses to the accident (immediate and follow up)
A description of the lessons learned form the accident

Item 5: Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 7 who has received mentor orientation may review drill and sign-off. Sign-off indicates that a drill has been prepared including:

A written description of the accident scenario including the operator and/or equipment failures that would be needed for the accident to occur, as applicable.
A written description of the consequences (physical and radiological) which could be anticipated from the accident.
A written description of any alarms or automated actions which could be anticipated from the accident.

Item 6: Sign-off indicates that the candidate has served as or observed the conduct of the NCSD Assembly Station Director during an emergency response drill or walk through. Any qualified Assembly Station Director who witnessed the performance may sign-off.

1. Qualified as NCS Engineer in Training.

Verified by: _____ Date: _____

2. Qualified as Assembly Station Director (TMS Module # 6502).

Verified by: _____ Date: _____

3. Read the current Y-12 Plant level and NCSD procedures describing emergency preparedness and response and discuss with mentor.

Procedure/instruction	Revision	Date Discussed	Mentor
Y40-000 through 004			
Y40-100			
Y40-66-CS-023			

4. Demonstrate a working knowledge of historical criticality accidents by discussing from memory 2 accidents selected by the mentor.

ACCIDENT DISCUSSED	DISCUSSION
	Mentor: _____ Date: _____
	Mentor: _____ Date: _____

5. Demonstrate a working knowledge of emergency preparedness and response procedures by creating a credible accident drill.

Verified by: _____ Date: _____

6. Serve as or observe the conduct of the NCSD Assembly Station Director during an emergency response drill or walk through.

Verified by: _____ Date: _____

_____ is recommended for task qualification in Emergency Response Planning
Candidate/badge

Recommended by: _____ Date: _____
Group Leader

This form is approved for use R. G. Taylor
QVO

Nuclear Criticality Safety Mentoring Checksheet

for

Task 8: Criticality Accident Alarm System (CAAS) Support

Candidate/badge: _____ Group Leader/badge: _____

Basic Instructions and Sign-off Criteria:

Item 1: Sign-off indicates that evidence of qualification as NCS Engineer in Training is in the NCSD training files. Verification of documentation may be made by the Training Coordinator.

Item 2: Applicable Duty Area Access training consists of NCS (general and plant specific) and Radworker II. Sign-off indicates that evidence of training is documented in the TMS system. Verification of documentation may be made by the Training Coordinator.

Item 3: Sign-off indicates that the Candidate has raised any questions or issues resulting from the reading with the mentor and that the mentor has provided an answer to address the questions/issues raised. No specific documentation of the discussion is necessary, however, if the discussions indicate the need for a procedure revision, this should be noted in the appropriate document history file maintained by the Compliance Group. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 8 who has received mentor orientation may discuss and sign-off.

Item 4: Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 8 who has received mentor orientation may discuss and sign-off. Sign-off indicates that the candidate can discuss from memory the items listed and be able to indicate on a site map CAAS detector locations and areas of coverage.

Item 5: The maintenance or facility representative performing the maintenance/testing may sign-off. Sign-off indicates that the candidate has observed the activity being performed.

1. Qualified as NCS Engineer in Training.

Verified by: _____ Date: _____

2. Required Duty Area Access training current.

Verified by: _____ Date: _____

3. Read the current DOE Orders, ANSI/ANS Standards and Y-12 Plant level and NCSD procedures describing the CAAS requirements and operation and discuss with mentor.

Procedure/instruction	Revision	Date Discussed	Mentor
DOE Order 5480.24			
ANSI/ANS 8.3			
ESS-CS-104			
Y70-151			
Y/DD-673			
Y/DD-598			
PES/164/012291			
Y10-187			
Y40-002			
Y40-100			
Y50-33-SO-031 thru 036 (any one)			
Y50-35-MD-151			
Y50-35-MD-77-024			
FS-102			
NMC Model GA-6 Manual			
YTS-1407			
YSS-101			

4. Demonstrate a working knowledge of the Y-12 CAAS by:

Indicating on a site map permanent detector location and areas of coverage.
Describing the CAAS detector type, sensitivity, response time, and set point for both permanent and portable detectors.
Describing the CAAS coincidence requirements and audible alarms.
Describing the calibration and maintenance requirements and methodology.
Describing facility OSR requirements related to the CAAS.

Verified by: _____ Date: _____

5. Observe the following maintenance activities for the Y-12 CAAS:

A. Detector replacement Verified by: _____ Date: _____
B. Post-maintenance Testing Verified by: _____ Date: _____
C. Detector Monthly or Quarterly Testing
Verified by: _____ Date: _____

_____ is recommended for task qualification in CAAS Support
Candidate/badge

Recommended by: _____ Date: _____
Group Leader

This form is approved for use R. G. Taylor
QAO

Nuclear Criticality Safety Mentoring Checksheet

for

Task 9: Order Compliance and NCS Procedures

Candidate/badge: _____ Group Leader/badge: _____

Basic Instructions and Sign-off Criteria:

Item 1: Sign-off indicates that evidence of qualification as NCS Engineer in Training is in the NCSD training files. Verification of documentation may be made by the Training Coordinator.

Item 2: Sign-off indicates that the Candidate has raised any questions or issues resulting from the reading with the mentor and that the mentor has provided an answer to address the questions/issues raised. No specific documentation of the discussion is necessary, however, if the discussions indicate the need for a procedure revision, this should be noted in the appropriate document history file maintained by the Compliance Group. Any NCS Engineer, NCS Specialist, or Technical Specialist qualified in Task 9 who has received mentor orientation may discuss and sign-off.

Items 3-6: Any NCSD Senior Staff or the Compliance Group Leader may sign-off. Sign-off indicates that the candidate has completed the review, corrective action plan, self-assessment, or flow down demonstration and turned in the results to the Compliance Group. Retention is at the discretion of the Compliance Group Leader.

1. Qualified as NCS Engineer in Training.

Verified by: _____ Date: _____

2. Read the current Federal Regulations, DOE Orders, ANSI/ANS Standards, and Y-12 Plant and NCSD level procedures/reports describing the overall nuclear criticality safety requirements and implementation at Y-12 and discuss with mentor.

Procedure/instruction	Revision	Date Completed	Mentor
ANSI/ANS 8.x standards			
DOE Order 5480.19, 20A, 24			
LMES, Y-12, and NCSD Procedures in NCSD Basic Reference Info., Vol. 1			
Applicable CFR's			

3. Demonstrate a working knowledge of the Y-12 Standards/Requirement Identification Documents (S/RIDs) by conducting a review of the Description of Assessment for 1 Statement selected by the Compliance Group to determine accuracy and completeness.

Verified by: _____ Date: _____

4. Demonstrate a working knowledge of the Y-12 corrective action process by developing a corrective action plan for an audit finding or observation selected by the Compliance Group.

Corrective Action Plan ID: _____

Verified by: _____ Date: _____

5. Demonstrate a working knowledge of the Audit/Assessment process by conducting a monthly NCSD Self-Assessment in accordance with Y/DD-552.

Self-Assessment Report: _____

Verified by: _____ Date: _____

6. Review a DOE order or ANS/ANSI document and demonstrate the impact upon the operations of the NCSD by illustrating the flow down of the source document requirement to the governing Y-12 and/or NCSD documents and describing the NCSD documentation necessary to illustrate compliance with the requirements from both a programmatic and performance standpoint.

Source Document:

Verified by: _____ Date: _____

_____ is recommended for task qualification in Order Compliance and NCS Procedures
Candidate/badge

Recommended by: _____ Date: _____
Group Leader

This form is approved for use R. G. Taylor
QVD

T9.SHT (Rev. 0, 3/15/96)

Nuclear Criticality Safety Mentoring Checksheet

for

Task 10: Independent Technical Review Board

Candidate/badge: _____ Group Leader/badge: _____

Basic Instructions and Sign-off Criteria:

Item 1: Sign-off indicates that evidence of qualification as NCS Specialist, NCS Engineer, or Technical Specialist is in the NCSD training files. For NCS Engineer or Technical Specialist, evidence of qualification in Tasks 5 and/or 6 is also required. Verification of documentation may be made by the Training Coordinator.

Item 2: Sign-off indicates that evidence of experience is in the NCSD training files. Verification of documentation may be made by the Training Coordinator.

Item 3: Sign-off indicates that the Candidate has raised any questions or issues resulting from the reading with the mentor and that the mentor has provided an answer to address the questions/issues raised. No specific documentation of the discussion is necessary, however, if the discussions indicate the need for a procedure revision, this should be noted in the appropriate document history file maintained by the Compliance Group. Any ITRB member who has received mentor orientation may discuss and sign-off.

1. Qualified as a NCS Specialist, NCS Engineer, or Technical Specialist. If highest qualification is Technical Specialist or NCS Engineer, then task qualification in Task 5, *NCS Computation Review*, and/or Task 6, *NCS Evaluation and Documentation Review*, is required. If qualified on only one of the two tasks, then ITRB activities shall be limited to computation or CSA/CSR review as applicable.

(If applicable) Task qualification: Task 5: _____ Task 6: _____

Verified by: _____ Date: _____

2. Evidence of 8 years of nuclear experience, (minimum of 5 years nuclear criticality safety, and 3 years Y-12 nuclear criticality safety), on file in the NCSD training files.

Verified by: _____ Date: _____

3. Read the NCSD level procedures and report describing the ITRB function, requirements, and charter and discuss with mentor.

Procedure/instruction	Revision	Date Completed	Mentor
Y50-66-CS-325			
Y/DD-673			
Y/DD-675			
Y/DD-669			
Y/DD-683			
ITRB Lessons Learned			
Y70-66-CS-332			

_____ is recommended for task qualification for the Independent Technical Review Board
Candidate/badge

Recommended by: _____ Date: _____
Group Leader

This form is approved for use R. G. Taylor QVO

T10.SHT (Rev. 1, 8/23/96)

Nuclear Criticality Safety Mentoring Checksheet

for

Task 11: Final NCS Technical Documentation Approval

Candidate/badge: _____

Basic Instructions and Sign-off Criteria:

Items 1 & 2: Sign-off indicates that evidence of serving as NCSD Superintendent **OR** qualification as NCS Specialist (including Task 10) and appointment by the NCSD Superintendent are in the NCSD training files. Verification of documentation may be made by the Training Coordinator.

1. Qualified as a NCS Specialist (including Task 10. *Independent Technical Review Board*), or serving as NCSD Superintendent.

Verified by: _____ Date: _____

2. Appointed in writing by the NCSD Superintendent to approve NCS Technical Documentation. Not required for NCSD Superintendent.

Verified by: _____ Date: _____

This form is approved for use R. G. Taylor
QVO

Nuclear Criticality Safety Mentoring Checksheet

for

Task 12: NCS Program Oversight

Candidate/badge: _____ Group Leader/badge: _____

Basic Instructions and Sign-off Criteria:

Items 1 & 2: Sign-off indicates that evidence of serving as NCSD Superintendent or NCSD Group Leader **OR** qualification as NCS Specialist, NCS Engineer, or Technical Specialist **AND** appointment by the NCSD Superintendent are in the NCSD training files. Verification of documentation may be made by the Training Coordinator.

1. Qualified as a NCS Specialist, NCS Engineer, Technical Specialist, or serving as NCSD Group Leader or NCSD Superintendent.

Verified by: _____ Date: _____

2. Appointed as NCS Subject Matter Expert by NCSD Superintendent (not required for NCSD Superintendent).

Verified by: _____ Date: _____

_____ is recommended for task qualification for NCS Program Oversight
Candidate/badge

Recommended by: _____ Date: _____
Group Leader

This form is approved for use R. L. Taylor
QVO

Nuclear Criticality Safety Mentoring Checksheet

for

Task 13: Emergency Operations Center (EOC) Support

Candidate/badge: _____ Group Leader/badge: _____

Basic Instructions and Sign-off Criteria:

Item 1: Sign-off indicates that evidence of qualification as NCS Specialist and in Task 7 are in the NCSD training files. Verification of documentation may be made by the Training Coordinator.

Item 2: Sign-off indicates that evidence of EOC Certification is in the TMS. Verification may be made by the Training Coordinator.

Item 3: Sign-off indicates that the candidate has discussed the content and use of EminS during EOC operations. Any NCS Specialist who is qualified in Task 13 and has had mentor orientation may sign-off.

Item 4: Sign-off indicates that the candidate has discussed the group/system support function during EOC operations. Any NCS Specialist who is qualified in Task 13 and has had mentor orientation may sign-off.

Item 5: Sign-off indicates that the candidate has discussed the incident classification levels and provided examples. Any NCS Specialist who is qualified in Task 13 and has had mentor orientation may sign-off.

Item 6: Sign-off indicates that the candidate participated in or observed an emergency response drill from the EOC. Any NCS Specialist who was present during the drill and who has had mentor orientation may sign-off.

1. Qualified as an NCS Specialist, and in Task 7, *Emergency Response Planning*.

Verified by: _____ Date: _____

2. Successfully complete EOC Certification. TMS # 17047

Verified by: _____ Date: _____

3. Demonstrate a working knowledge of EminS by discussing the content and use of the system during EOC operations.

Verified by: _____ Date: _____

4. Demonstrate a working knowledge of the following by discussing their function in support of EOC operations:

Accident Response Group (ARG)
Aerial Measuring System (AMS)
Atmospheric Release Advisory Capability (ARAC)
Nuclear Emergency Search Team (NEST)
Federal Radiological Monitoring and Assessment Center (FRMAC)
Radiation Emergency Assistance Center/Training Site (REAC/TS)
Radiological Assistance Program (RAP)

Verified by: _____ Date: _____

5. Demonstrate a working knowledge of incident classification levels by discussing and providing examples of the various levels.

Verified by: _____ Date: _____

6. Participate in the conduct of or observe an emergency response drill from the EOC.

Verified by: _____ Date: _____

_____ is recommended for task qualification for EOC Support
Candidate/badge

Recommended by: _____ Date: _____
Group Leader

This form is approved for use R. G. Taylor
QVO

T13.SHT (Rev. 0, 3/15/96)

ATTACHMENT D - OTHER DOCUMENTS

Examples of the following NCSD specific training documents are included in this attachment:

Instructions to Mentors
Mentor Self-Study Record
Task Qualification Record
Protocol for Experienced Personnel Evaluation
Experienced Personnel Evaluation
Evaluator Guide for Oral Qualification Boards
Oral Qualification Board Report
Continuing Technical Training Plan
Recurring Training Planning
Continuing Technical Training Record
List of Qualified Personnel

INSTRUCTIONS TO MENTORS

1. Safety is paramount - the mentor shall take appropriate steps to ensure the safety of the candidate, as well as that of plant personnel and the public.
2. The mentor must be convinced that the candidate understands the intent and content of each completed assignment before signing off. Observing performance, tutoring/coaching to correct performance, and questioning are all part of the mentoring process.
3. Ethics - Be objective in evaluating candidate competency; do not sign-off on a task until you feel that the candidate is capable of performing independently.
4. Fairness - If you feel that a personality conflict interferes with the mentor/candidate relationship, attempt to resolve the conflict or ask the Group Leader to assign another mentor.
5. Consistency - Ensure that mentoring is applied consistently, so that each candidate has the same learning opportunities.
6. Accuracy - If the checklist does not adequately address the learning objective, performance standard, or evaluation method, work with the QVO and TC to correct it.
7. Records - The mentoring checklist is a training evaluation document and, with entries, is LMES CONFIDENTIAL.

NUCLEAR CRITICALITY SAFETY DEPARTMENT
MENTOR SELF-STUDY RECORD

Mentor: _____ Badge: _____

I have read the following documents in preparation to be a mentor for the NCSD Qualification Program and discussed any questions with the Qualification Verification Official. I understand the roles and responsibilities of the mentor and the signature criteria applicable to the checksheets which I will be signing.

Y90-080, *Conduct of Training Implementation*

Y/DD-694, *Qualification Program. Nuclear Criticality Safety Department*

Y/DD-696, *Training Implementation, Nuclear Criticality Safety Department*

Signature: _____ Date: _____

TASK QUALIFICATION RECORD

Candidate _____ Badge No. _____

Task _____

Qualification is effective for area(s) _____

Qualification is effective for code(s) _____

Based on completion of the Prior Qualification Requirements, Experience Requirements, Duty Area Access, Basic Facility Knowledge, and Task activities from the NCS Task Mentoring Checklist, the Candidate listed above is recommended for qualification in the task listed above with area and code limitations as listed. A copy of the Mentoring Checksheet(s) and Oral Qualification Board Report (tasks 5 and 6 only) are attached.

Group Leader: _____ Badge No. _____ Date _____

I am satisfied that the training and qualification requirements for all portions of the task qualification above have been met and the candidate listed above is qualified.

QVO: _____ Badge No. _____ Date _____

I have reviewed this task qualification and am satisfied that the training and qualification requirements of the task qualification above have been met and the candidate listed above is qualified.

NCSD Superintendent: _____ Badge No. _____ Date _____

This form is approved for use_____
QVO

NUCLEAR CRITICALITY SAFETY DEPARTMENT

PROTOCOL FOR

EXPERIENCED PERSONNEL EVALUATION

1. Definitions and Requirements:

A. Definitions:

(1) "Training is instruction designed to develop or improve job performance." [DOE Order 5480.20A, Attachment 2, item 2.gg., 11/15/94]

(2) "Qualification is defined in terms of education, experience, training, examination, and any special requirements necessary for performance of assigned responsibilities." [DOE Order 5480.20A, Chapter I, Item 5., 11/15/94]

(3) "Exception: A release of an individual from portions of a training program through prior education, experience, and/or testing:

- May be requested by the line management organization, OR
- May be documented in the Training Program File and reflect a lower level of training being satisfied by a higher level." [LMES procedure Y90-020, "Exceptions, Extensions, Alternatives, and Waivers," item IV.C., 5/17/94]

B. Requirements [from Y90-020, item VI.]:

(1) "A. If a challenge exam is not used to document the requisite skills and knowledge of a candidate, an exception from training shall be justified and documented using Appendix A, 'Exception from Training.'"

(2) "B. Justification for an exception shall include:

- Documentation that the candidate has completed, within the last two years, course work equal to or more advanced than the subject matter of the excepted training, OR

- Documentation that the candidate, within the last two years, is proficient in the task for which training is being excepted, OR

  NOTE: **The following justification may be used for course work but may not be sufficient for proof of task proficiency.**

- Documentation that the candidate served as Subject Matter Expert (SME) or the member of the training staff which developed the training being excepted."

2. Conduct of the Experienced Personnel Evaluation Board:

The purpose of Experienced Personnel Evaluation is to examine previous experience with similar task activities to determine whether or not Mentoring Checklist and Checksheet items are considered satisfied. To accomplish the evaluation, an Experienced Personnel Evaluation Board composed as specified in Qualification Program documents and chaired by the Qualification Verification Official (QVO) will be convened. The board will employ the following steps and criteria:

A. The applicable Checklist(s) and Checksheet(s) will be stepped through, item by item.

B. Tangible, objective evidence of past experience and activities will be examined to determine whether or not a Checklist/Checksheet item can be considered satisfied.

(1) Satisfaction of an item requires unanimous agreement of the Experienced Personnel Evaluation Board. Abstentions are not permitted.

(2) The tangible, objective evidence examined will be preserved as part of the record.

(3) If a Checksheet item is not considered to be satisfied, then:

(A) It will be completed by the candidate to the satisfaction of the mentor, or

(B) The item may be modified by unanimous agreement of the Experienced Personnel Evaluation Board, its completion assigned to the candidate, and completed by the candidate to the satisfaction of the mentor.

C. Where tangible, objective evidence is not available for examination, evidence will be developed by challenging oral discussion and questioning.

(1) The questions asked of the candidate must be documented and must be convincingly challenging as to breadth and depth of the subject matter being examined. It is intended that the questioning discussion serve as a challenge examination of the Checklist/Checksheet item under consideration so that an exception will not be necessary.

(2) A qualitative indication of the acceptability of the response must be documented.

(3) Satisfaction of an item requires unanimous agreement of the Experienced Personnel Evaluation Board. Abstentions are not permitted.

(4) If a Checksheet item is not considered to be satisfied, then:

(A) It will be completed by the candidate to the satisfaction of the mentor, or

(B) The item may be modified by unanimous agreement of the Experienced Personnel Evaluation Board, its completion assigned to the candidate, and completed by the candidate to the satisfaction of the mentor.

D. The Experienced Personnel Evaluation will be documented using the Experienced Personnel Evaluation Form.

EXPERIENCED PERSONNEL EVALUATION (see Y90/020)

Candidate _____ Badge No. _____

Program evaluated: _____

Task evaluated: _____

Qualification will be effective for area(s): _____
Qualification will be effective for code(s): _____

Based on experience in the completion of similar task activities in the past, the following Mentoring Checklist and Checksheet activities are considered satisfied:

NCS Engineering in Training Checklist:

_____
_____
_____

NCS Engineer, NCS Specialist, or Technical Specialist Checklist (Circle one):

_____
_____
_____

NCS Task Checksheet for _____:

_____
_____
_____

NCS Task Checksheet for _____:

_____
_____
_____

NCS Task Checksheet for _____:

_____
_____
_____

The above is based on documentation provided by the Candidate and attached supplemented by oral discussion and questioning.

Items addressed:

_____
_____
_____
_____
_____
_____
_____

EXPERIENCED PERSONNEL EVALUATION (see Y90/020)

QVO_____ Badge No. _____ Date _____

Group Leader_____ Badge No. _____ Date _____

Board Member_____ Badge No. _____ Date _____

This form is approved for use R. G. Taylor
QVO

EVALUATOR GUIDE FOR ORAL QUALIFICATION BOARDS

1.0 Materials required

The oral board is intended to evaluate the Candidate's overall breadth and depth of knowledge of nuclear criticality safety as it relates to the Task or Program qualification under consideration. As it is not intended to address the detailed mechanics of task performance, which by their nature require the extensive use of reference materials, the oral board shall be a "closed book" examination. Therefore, no reference materials are required to conduct the oral board.

A blackboard, white board, or flip chart, with suitable markers, shall be available for use by the Candidate as desired to respond to questions.

Board members shall have an Oral Qualification Board Record with predetermined questions to be used during the oral board.

2.0 Instructions to Candidate

At the start of the oral board, the NCSD Superintendent or QVO shall instruct the Candidate as follows. Verbatim reading is not required as long as the content of the instructions below is addressed.

> This is an oral examination which evaluates your knowledge of nuclear criticality safety as related to _____ (Task or Program). The questions you will be asked relate to the theory and practice of nuclear criticality safety as related to _____ (Task or Program).
>
> We will ask questions, and you will be allowed time to answer each question fully before a new question is asked. You may use the blackboard (white board, flipchart) if you feel you need to illustrate any of your answers.
>
> We will be scoring your responses throughout the examination. After the examination we will review your answers with you.
>
> If you have any questions during the examination, we will clarify the questions asked, but we will not lead or coach you.

3.0 Scoring

Each major question shall be graded on a scale of 1 - 10 where:

> 1 = Unsatisfactory knowledge level (no understanding displayed)
> 3 = Unsatisfactory knowledge level (incomplete understanding displayed)
> 5 = Acceptable knowledge level (understanding of significant issues displayed)
> 7 = Acceptable knowledge level (understanding of most issues displayed)
> 10 = Acceptable knowledge level (complete understanding displayed)
>
> The average of the individual board member's grade shall be recorded on the master Oral Qualification Board Record.

At the completion of the board, an overall grade of Pass or Fail shall be assigned and recorded on the master Oral Qualification Board Record. A Pass shall be assigned only on a unanimous decision. Note that an unsatisfactory knowledge level on one or more of the individual questions should not automatically result in an overall "Fail" evaluation. The overall evaluation shall consider the quality of all responses and not be unduly influenced by any weakness displayed.

4.0 Review with Candidate

The results of the oral board shall be discussed with the Candidate with equal emphasis on satisfactory and unsatisfactory responses. Following this review, the Candidate shall indicate understanding of the results, and in particular the additional knowledge required for any unsatisfactory responses.

5.0 Remediation plans

Actions necessary for a "Fail" result on the oral board are outlined in Y/DD-694. For "Pass" results, restudy and review with the QVO of any unsatisfactory responses shall be performed prior to qualification.

6.0 Documentation

Documentation requirements are outlined in Y/DD-696. Only the master Oral Qualification Board Record need be retained.

7.0 Oral Board Content Guidelines

Oral Qualification Boards are used to verify a Candidate's overall knowledge level for Tasks 5 and 6 and for technical program level qualifications beyond Engineer in Training. Over time, a detailed question and answer bank will be developed for these oral boards addressing key topics based primarily on the questions that "worked" during the performance of oral boards. In the interim, the board members shall meet prior to the board and prepare a list of questions to be asked and discuss the content of an acceptable response. Note that it is not necessary to ask every question prepared, nor is it necessary to limit questioning to the prepared questions. To provide some consistency for oral boards while the question bank is under development, questions for oral boards should address the following topics.

7.1 NCS Engineer

Knowledge of NCS-related procedures: Given a procedure, what is the purpose/scope of the procedure and provide a general description of the contents. Alternatively, given a task, which procedures should be consulted?

Knowledge of NCS-related Orders/Standards/Regulations: Given a order/standard/regulation, what is the purpose/scope of the order/standard/regulation and provide a general description of the contents. Alternatively, given a task, which orders/standards/regulations apply and what do they require?

Knowledge of Y-12 Plant processes and equipment: Given a building or operating area within the assigned group (metals or solutions as appropriate), describe the equipment and processes located in the facility and the activities that can be expected to be performed from the perspective of NCS concerns related to the equipment/process/activity.

Demonstrate the ability to distinguish between NCS Incidents and NCS Deficiencies and describe the required response to each. Response should include immediate and follow-up actions and include a description of any documentation required.

Describe the External Monitoring program: types of external monitoring, purpose of each type, driver (regulatory requirement) for each type, requirements for each type. Administrative activities related to the program: procedure and documentation.

Describe the CSA and CSR process. Explain when the management plans are applicable and what the purpose of each management is and what is different between the plan and standard procedures.

Knowledge of CSA and CSR topics: Utilize any of the topics provided in the Task 6 list.

Describe the computation process. Explain when the management plans are applicable and what the purpose of each management is and what is different between the plan and standard procedures.

Knowledge of computation topics: Utilize any of the topics provided in the Task 5 list.

Describe how Operations controls work on the floor. Explain when a procedure is needed and when written instructions and/or postings are sufficient. With regard to procedures, how and where and what CSA requirements are incorporated.

7.2 Task 5: Computation Review

Demonstrate a knowledge of the recent problem areas in NCS Computations by summarizing the recent ITRB findings related to computations as recorded in the monthly ITRB reports.

Demonstrate a knowledge of the KENO Va (or other code, as appropriate) computer code by describing:

The theoretical basis of the code.
The interface between SCALE and the code.
The accuracy and limitations of the code.

Demonstrate familiarity with NCS code calculations: Given a typical problem, describe how the problem would be modeled and the anticipated results. Discuss variation in the results anticipated with variation of the input parameters.

7.3 Task 6: CSA Review

Knowledge of DOE Standard 3007: Describe the content of the standard and how the requirements are implemented.

Demonstrate a knowledge of the recent problem areas in CSAs and/or CSRs by summarizing the recent ITRB findings related to CSAs and/or CSRs as recorded in the monthly ITRB reports.

Demonstrate a knowledge of the difference between double contingency requirements, defense in depth recommendations, and good practice recommendations by giving examples of each.

Describe the differences between CSAs and CSRs, including:

The request, evaluation, and approval portions, including any EUO Process Based Restart variations from the standard approach.
The mechanism for field implementation of requirements.
The mechanism for field implementation of "good practices" and "defense in depth" recommendations.

Demonstrate familiarity with NCS evaluations and the resultant documentation: Given a typical problem, describe how the problem would be evaluated and the anticipated results. Discuss double contingency requirements, defense in depth recommendations, and good practice recommendations which could be anticipated to arise from the evaluation.

ORAL QUALIFICATION BOARD REPORT

Candidate: _____ Badge: _____

Task or Program: _____ Date: _____

Response to examination questions:

Question	Rating
1.	1 2 3 4 5 6 7 8 9 10
2.	1 2 3 4 5 6 7 8 9 10
3.	1 2 3 4 5 6 7 8 9 10
4.	1 2 3 4 5 6 7 8 9 10
5.	1 2 3 4 5 6 7 8 9 10
6.	1 2 3 4 5 6 7 8 9 10
7.	1 2 3 4 5 6 7 8 9 10
8.	1 2 3 4 5 6 7 8 9 10
9.	1 2 3 4 5 6 7 8 9 10
10.	1 2 3 4 5 6 7 8 9 10
11.	1 2 3 4 5 6 7 8 9 10
12.	1 2 3 4 5 6 7 8 9 10
13.	1 2 3 4 5 6 7 8 9 10
14.	1 2 3 4 5 6 7 8 9 10
15.	1 2 3 4 5 6 7 8 9 10
16.	1 2 3 4 5 6 7 8 9 10
17.	1 2 3 4 5 6 7 8 9 10
18.	1 2 3 4 5 6 7 8 9 10
19.	1 2 3 4 5 6 7 8 9 10
20.	1 2 3 4 5 6 7 8 9 10

Overall evaluation: Pass _____ Fail _____

For "Pass" evaluation: The topics or questions noted below shall be discussed with the QVO prior to qualification:

_____

_____

_____

_____

Board Members: NCSD Superintendent: _____

QVO: _____

Additional Member: _____

Additional Member: _____

Additional Member: _____

ORAL QUALIFICATION BOARD REPORT (Continued)

The results of the oral board have been discussed and I understand what additional knowledge and understanding is required for a satisfactory rating on all questions answered in an unsatisfactory manner.

Candidate: _____

Weak areas noted above have been discussed and Candidate displayed satisfactory knowledge level.

QVO: _____ Date: _____

NUCLEAR CRITICALITY SAFETY DEPARTMENT
CONTINUING TECHNICAL TRAINING PLAN

POTENTIAL TRAINING ITEM:

_____
_____
_____
_____

SOURCE: _____

CLASSIFICATION: Routine: _____ Urgent: _____ Not Required: _____

JUSTIFICATION FOR ROUTINE OR NOT REQUIRED CLASSIFICATION:

_____
_____
_____

TRAINING METHOD SELECTION: (Select at least one)

_____ Required Reading Number: _____
Yes/No

_____ NCSD Meeting
Yes/No

MEETING AGENDA (If Applicable):

_____
_____
_____
_____
_____

Compliance Group: _____

Qualification Verification Official: _____

NCSD Superintendent: _____ (Not required for Required Reading)

TRAINING COMPLETE: Training Coordinator :_____ Date: _____

NUCLEAR CRITICALITY SAFETY DEPARTMENT
RECURRING TRAINING PLANNING

Fiscal Year:_____

Topic	Frequency

Approvals: _____ _____

QVO Date

_____ _____

NCSD Superintendent Date

NUCLEAR CRITICALITY SAFETY DEPARTMENT
CONTINUING TECHNICAL TRAINING RECORD

NCSD Staff Member: _____ Badge: _____

YEAR	REQUIRED READING COMPLETE (DATE)	TECHNICAL MEETING(S) COMPLETE (DATE)	VERIFIED BY (TRAINING COORDINATOR)
1996			
1997			
1998			
1999			
2000			

LIST OF QUALIFIED PERSONNEL (EXAMPLE)

The following example tables are to be completed and issued as a revision to Y/DD-587 as necessary by the TC.

Table 1 - Personnel Qualified in NCS Programs
Table 2 - Personnel Qualified in NCS Tasks and Duty Assignments (2 parts, including area tabulation)
Table 3 - Personnel Qualified in NCS Computer Codes

Table 1 - Personnel Qualified in NCS Programs (Example)

Attainment of a qualification shall be indicated by entering the date that the qualification is attained.

NAME	NCS ENGINEER IN TRAINING	NCS ENGINEER	NCS SPECIALIST	TECHNICAL SPECIALIST	COMMENTS

Table 2 - Personnel Qualified in NCS Tasks and Duty Assignments (Example)

Attainment of a qualification shall be indicated by entering the date that the qualification is attained.

NAME	EXTERNAL MONITORING (2)	NCS EVALUATION & DOCUMENT	OPERATE PROCEDURE REVIEW (2)	NCS COMPUTE (1)	NCS COMPUTE REVIEW (1)	NCS EVALUATION & DOCUMENT REVIEW	EMERGENCY RESPONSE PLANNING	CAAS SUPPORT	COMPLIANCE & NCS PROCEDURE

NOTE 1: Code indicated on Table 3

NOTE 2: Functional area indicated on Table below

FUNCTIONAL AREA QUALIFICATION FOR TASKS 3 AND 6												
NAME	METALS					SOLUTIONS						
	9212	9215	9204-2/2E	9720-5	9204-4	9212	9818	9980	9206	9995	WTO	WSSO

Table 2 (continued) - Personnel Qualified in NCS Tasks and Duty Assignments (Example)

Attainment of a qualification shall be indicated by entering the date that the qualification is achieved.

NAME	ITRB MEMBER	NCS DOCUMENT APPROVAL	NCS PROG OVERSIGHT	EOC SUPPORT

Table 3 - Personnel Qualified in NCS Computer Codes (Example)

Attainment of a qualification shall be indicated by entering the date that the qualification is attained.

NAME	KENO-IV	KENO-IV General Geometry	KENO Va with BONAMI/NITAWI	MONK	MCNP	XRSDRNPM	DOT

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