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LOCKHEED MARTIN ENERGY SYSTEMS, INC.

TRAINING IMPLEMENTATION

NUCLEAR CRITICALITY SAFETY DEPARTMENT (NCSD)

Approvals:

Qualification Verification Official: R.G. Taylor

Superintendent, NCSD: [Signature]
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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.

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:

- Basic theory and practice knowledge (3 checksheets)
- 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

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 detail 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 ApprovedEvaluator 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 Expenanced 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.
Examples of the following TMS Programs are included in this Attachment:

<table>
<thead>
<tr>
<th>TMS Program #</th>
<th>Program Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>5939</td>
<td>NCS Engineer in Training</td>
</tr>
<tr>
<td>5764</td>
<td>Technical Specialist</td>
</tr>
<tr>
<td>5761</td>
<td>NCS Engineer</td>
</tr>
<tr>
<td>5762</td>
<td>NCS Specialist</td>
</tr>
<tr>
<td>5763</td>
<td>NCS Superintendent</td>
</tr>
<tr>
<td>5770</td>
<td>Continuing Training, Technical Support Staff and Managers</td>
</tr>
</tbody>
</table>
Qualification Requirements List, NCS Engineer in Training
Initial Qualification
Y-12 Plant Nuclear Criticality Safety Department
TMS Program # 5939
Revision 2.03/21/96

<table>
<thead>
<tr>
<th>TMS Module No. or Documentation</th>
<th>Qualification Requirement</th>
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</thead>
<tbody>
<tr>
<td>17135</td>
<td>Evidence of Baccalaureate (Module 17135) in engineering or related science (diploma, transcript, or equivalent) on file in the NCSD training records.</td>
</tr>
<tr>
<td>9673</td>
<td>Energy System General Employee Rad Training (GERT)</td>
</tr>
<tr>
<td>4744</td>
<td>Energy Systems General Employee Hazard Communication (GET Hazcom)</td>
</tr>
<tr>
<td>4745</td>
<td>Energy Systems General Topics (GET)</td>
</tr>
<tr>
<td>1134</td>
<td>Computer Security</td>
</tr>
<tr>
<td>5724</td>
<td>Handling Classified Documents</td>
</tr>
<tr>
<td>10158</td>
<td>Free From the Influence-Employee Training</td>
</tr>
</tbody>
</table>

**Duty Area Access**

**NCS Engineer in Training - Job Specific**

<table>
<thead>
<tr>
<th>TMS Module No. or Documentation</th>
<th>Qualification Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>14666</td>
<td>NCS Engineer in Training Mentoring Checklist</td>
</tr>
</tbody>
</table>

*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
<table>
<thead>
<tr>
<th>TMS Module No. or Documentation</th>
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</thead>
<tbody>
<tr>
<td><strong>Entry Level</strong></td>
<td></td>
</tr>
<tr>
<td>Program 5939</td>
<td>Evidence of qualification as Engineer In Training (Program 5939) on file in the NCSD training records.</td>
</tr>
<tr>
<td><strong>Job Fundamentals</strong></td>
<td></td>
</tr>
<tr>
<td>9673 Energy System General Employee Rad Training (GERT)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Duty Area Access</strong></td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>11536 Medical Exam - PSAP</td>
<td></td>
</tr>
<tr>
<td>9727/3257 Aberrant Behavior, Video or Presentation</td>
<td></td>
</tr>
<tr>
<td>11658 Personnel Security Assurance Program Orientation Video</td>
<td></td>
</tr>
<tr>
<td>1613/1302 or 1119/8863 NCS for Fissionable Material Worker/NCS for Y-12 Fissionable Material Worker</td>
<td></td>
</tr>
<tr>
<td>956 Radiological Worker II (DOE Core, Y-12 Specific)</td>
<td></td>
</tr>
<tr>
<td><strong>Technical Specialist</strong></td>
<td></td>
</tr>
<tr>
<td>Optional 13932, Individual Development Plan, if appropriate</td>
<td></td>
</tr>
<tr>
<td>13953 Technical Specialist Mentoring Checklist</td>
<td></td>
</tr>
<tr>
<td>*Evidence of two years job-related experience and one year nuclear experience on file in the NCSD training records. (Documented on Checklist # 13953)</td>
<td></td>
</tr>
</tbody>
</table>

*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 2, 03/15/96**

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<tbody>
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<td></td>
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<tr>
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<td>Evidence of qualification as NCS Engineer in Training (Program 5939) on file in the NCSD training records.</td>
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<tr>
<td><strong>Job Fundamentals</strong></td>
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<tr>
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<td>Energy Systems General Toxicity (GET)</td>
</tr>
<tr>
<td>10158</td>
<td>Drug Awareness (Free from the influence)</td>
</tr>
<tr>
<td>5724</td>
<td>Handling Classified Documents</td>
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<tr>
<td>1134</td>
<td>Computer Security</td>
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<td>Aberrant Behavior, Video or Presentation</td>
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<td>1613/1302 or 0119/8863</td>
<td>NCS for Fissionable Material Worker/NCS for Y-12 Fissionable Material Worker or NCS for Supervisors/NCS for Y-12 Supervisors</td>
</tr>
<tr>
<td>956</td>
<td>Radiological Worker II (DOE Core, Y-12 Specific)</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>TMS Module No. or Documentation</th>
<th>Qualification Requirement</th>
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<tbody>
<tr>
<td><strong>Entry Level</strong></td>
<td></td>
</tr>
<tr>
<td>Program 5761</td>
<td>Evidence of qualification as NCS Engineer (Program 5761) on file in the NCSD training records.</td>
</tr>
<tr>
<td><strong>Job Fundamentals</strong></td>
<td></td>
</tr>
<tr>
<td>9673</td>
<td>Energy System General Employee Rad Training (GERT)</td>
</tr>
<tr>
<td>4744</td>
<td>Energy Systems General Employee Hazard Communication (GET Hazcom)</td>
</tr>
<tr>
<td>4745</td>
<td>Energy Systems General Topics (GET)</td>
</tr>
<tr>
<td>10158</td>
<td>Drug Awareness (Free from the Influence)</td>
</tr>
<tr>
<td>5724</td>
<td>Handling Classified Documents</td>
</tr>
<tr>
<td>1134</td>
<td>Computer Security</td>
</tr>
<tr>
<td><strong>Duty Area Access</strong></td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>11536</td>
<td>Medical Exam - PSAP</td>
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<tr>
<td>11658</td>
<td>Personnel Security Assurance Program Orientation Video</td>
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<tr>
<td>9727/3257</td>
<td>Aberrant Behavior. Video or Presentation</td>
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<tr>
<td>1613/1302 or 1119/8863</td>
<td>NCS for Fissionable Material Worker/NCS for Y-12 Fissionable Material Worker</td>
</tr>
<tr>
<td>956</td>
<td>Radiological Worker II (DOE Core, Y-12 Specific)</td>
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<tr>
<td><strong>NCS Specialist - Job Assignment Specific</strong></td>
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<tr>
<td>13952</td>
<td>NCS Specialist Mentoring Checklist</td>
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<td></td>
<td>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).</td>
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*At the time this document was published, a TMS Module No. did not exist for these requirements.*
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<td><strong>Job Fundamentals</strong></td>
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<td>1134</td>
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<td>5724</td>
<td>Handling Classified Documents</td>
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<td>727/3257</td>
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<td>NCS for Fissionable Material Worker/NCS for Y-12 Fissionable Material Worker</td>
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<tr>
<td>956</td>
<td>Radiological Worker II (DOE Core, Y-12 Specific)</td>
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<tr>
<td><strong>NCSD Superintendent - Job Specific</strong></td>
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</tr>
<tr>
<td>Program 6000</td>
<td>HSEA Manager Qualification Requirements</td>
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*At the time this document was published, a TMS Module No. did not exist for these requirements.*

---

HSEA Training Manager

Qualification Verification Official (QVO)

NCS Superintendent

HSEA Organization Manager
## Continuing Training Requirements for Technical Support Staff

**TMS Program # 5770**  
**Revision 3, 08/20/96**

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<td>9673</td>
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<td>Energy Systems General Employee Hazard Communication (GET Hazcom)</td>
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<td>Energy Systems General Topics (GET)</td>
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<td>Computer Security</td>
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<td>Handling Classified Documents, Refresher</td>
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<td>11536</td>
<td>Medical Exam - PSAP</td>
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<td>PSAP Annual Review</td>
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<td>Program 5765</td>
<td>Respirator for Supervisor Requirements</td>
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<td>Program 5768</td>
<td>Manager/Supervisor Core Requirements</td>
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<td>1613/1302 or 0119/8863</td>
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<td>NCS for Supervisors/NCS for Y-12 Supervisors</td>
<td>956</td>
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<td><strong>17890</strong> NCS Engineer Requalification</td>
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<td><strong>Variable Requirements and Enhancements</strong></td>
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<td>Optional</td>
<td>13932, Individual Development Plan, if applicable</td>
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<tr>
<td>Optional</td>
<td>Operating experience, required reading, technical discussions, participation in facility drills, LMES or offsite courses for professional development, etc.</td>
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<td>Training required for advancement to next level</td>
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*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**  
**Qualification Verification Official (QVO)**  
**NCS Superintendent**  
**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 ______________________

AMS14666.LST (Rev. 1, 3/15/96)
# NCS ENGINEER MENTORING CHECKLIST TMS # 13933

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<td><strong>Prior Qualification Requirements</strong></td>
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<td></td>
<td>Evidence of qualification as NCS Engineer in Training on file in the NCSD training records.</td>
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<td>Verified by: ________________________</td>
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<td></td>
<td>Training Coordinator</td>
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<tr>
<td></td>
<td><strong>Experience Requirements</strong></td>
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<tr>
<td></td>
<td>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.</td>
</tr>
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<tr>
<td></td>
<td>Training Coordinator</td>
</tr>
<tr>
<td></td>
<td><strong>Duty Area Access</strong></td>
</tr>
<tr>
<td></td>
<td>Evidence of duty area access LMES training on file in the TMS system.</td>
</tr>
<tr>
<td></td>
<td>Verified by: ________________________</td>
</tr>
<tr>
<td></td>
<td>Training Coordinator</td>
</tr>
<tr>
<td></td>
<td><strong>Basic facility knowledge</strong></td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Group: ________________________</td>
</tr>
<tr>
<td></td>
<td>Verified by: ________________________</td>
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<tr>
<td></td>
<td>Training Coordinator</td>
</tr>
<tr>
<td></td>
<td><strong>Task Qualification</strong></td>
</tr>
<tr>
<td></td>
<td>Demonstrate proficiency in the performance of external monitoring, NCS evaluation and documentation, operating procedure approval, and NCS computation by qualification in Tasks 1 - 4.</td>
</tr>
<tr>
<td></td>
<td>Verified by: ________________________</td>
</tr>
<tr>
<td></td>
<td>Training Coordinator</td>
</tr>
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TMC13933.LST (Rev. 4, 8/23/96)
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 ________________

TMC13933.LST (Rev. 4, 8/23/96)
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

TMC13952.LST (Rev. 1, 8/23/96)
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 ____________________________

TMC13952.LST (Rev. 1, 8/23/96)
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
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: ________

This form is approved for use ____________________

TMC13953.LST (Rev. 1. 8/23/96)
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. B. Taylor

TMC17890.LST (Rev. 0, 8/23/96)
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 tiles 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.


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.

BTPK1.SHT (Rev. 1. 3/15/96)
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<th>MENTOR</th>
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<td>4 (Rev ____ )</td>
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</table>

This form is approved for use by R.E. Taylor.

BTPKI.SHT (Rev. 1, 3/15/96)
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.


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.
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<td>8 (Rev ___)</td>
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</table>

This form is approved for use [Signature]

QVO
Nuclear Criticality Safety Mentoring Checsheet

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: ____________


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

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."


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?

This form is approved for use by Taylor

BTPK3.SHT (Rev. 1. 3/15/96)
# 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/issuses 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.

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<th>TITLE</th>
<th>REVISION</th>
<th>SECTION</th>
<th>COMPLETION</th>
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<td>NUREG/CR-0095, ORNL/NUREG/CSD-6</td>
<td>Nuclear Safety Guide, TID-7016</td>
<td>Revision 2</td>
<td>Pages 1 - 11</td>
<td>Date: ________ Mentor: ________</td>
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<tr>
<td>NUREG/CR-0095, ORNL/NUREG/CSD-6 and DOE/NCT-04</td>
<td>Nuclear Safety Guide, TID-7016</td>
<td>Revision 2</td>
<td>Pages 13 - 21</td>
<td>Date: ________ Mentor: ________</td>
</tr>
<tr>
<td>DOE Order 5480.19</td>
<td>Conduct of Operations</td>
<td>All</td>
<td>Date: ________ Mentor: ________</td>
<td></td>
</tr>
<tr>
<td>DOE Order 5480.24 and Interpretive Guidance for DOE Order 5480.24</td>
<td>Nuclear Criticality Safety</td>
<td>All</td>
<td>Date: ________ Mentor: ________</td>
<td></td>
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<td>ANSI/ANS-8.3-1986, the Clarification of Paragraphs (1) 4.2, (2) 4.2.2, 4.4.3, 4.4.4, 4.4.5, 4.5.3, 5.3, 5.7.1, and (3) 5.5, 4.2.2, and the Interpretation of Paragraph 5.2</td>
<td>Criticality Accident Alarm System</td>
<td>All</td>
<td>Date: ________ Mentor: ________</td>
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BDK.SHT (Rev. 3, 8/23/96)
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<td>Y70-159</td>
<td>Fissile Material Activity Identification, Marking, and Requirements Posting</td>
<td>Rev:</td>
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<td>Rev:</td>
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<td>NCS Guidelines for Fire Fighting</td>
<td>Rev:</td>
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<tr>
<td>Y/DD-717</td>
<td>Annual Reviews of Non-continuing Operations FMAs</td>
<td>Rev:</td>
<td>All</td>
<td>Date:</td>
</tr>
</tbody>
</table>
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 [signature]

BDK.SHT (Rev. 3, 8/23/96)
Nuclear Criticality Safety Mentoring Checksheet

for

Basic Facility Knowledge

Candidate/badge: ____________________  Superviser/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.

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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:

<table>
<thead>
<tr>
<th>FACILITY</th>
<th>OSR DISCUSSION</th>
<th>FACILITY ORIENTATION COURSE OR TOUR</th>
</tr>
</thead>
</table>
| Building 9212:  
E-Wing Casting  
E-Wing Vaults  
E-Wing Packaging | OSR(s): ____________  
__________  
__________ | 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 or Facility  
Rep: ____________ |

| Buildings 9204-2/2/2:  
Disassembly Room  
Nondestructive Testing (NDT) and Inspection  
Floor Operations and Storage | OSR(s): ____________  
__________  
__________ | Date: ____________  
Mentor or Facility  
Rep: ____________ |

| Building 9204-4:  
Quality Evaluation Laboratory / Reclamation  
Bonded Storage  
Basement Vault-type Room | OSR(s): ____________  
__________  
__________ | Date: ____________  
Mentor or Facility  
Rep: ____________ |
<table>
<thead>
<tr>
<th>FACILITY</th>
<th>OSR DISCUSSION</th>
<th>FACILITY ORIENTATION COURSE OR TOUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building 9720-5:</td>
<td>OSR(s): _______</td>
<td>Date: _____________________________</td>
</tr>
<tr>
<td>Vaults</td>
<td></td>
<td>Mentor or Facility Rep: ___________</td>
</tr>
<tr>
<td>Floor Operations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mentor:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>FACILITY</th>
<th>OSR DISCUSSION</th>
<th>FACILITY ORIENTATION COURSE OR TOUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building 9212:</td>
<td>OSR(s): _______</td>
<td>Date: _____________________________</td>
</tr>
<tr>
<td>Special Process Rooms 1004 and 1010</td>
<td></td>
<td>Mentor or Facility Rep: ___________</td>
</tr>
<tr>
<td>Special Process Rooms 1021, 1022, and 1022A</td>
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<td></td>
</tr>
<tr>
<td>Headhouse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-1 Wing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C-1 Wing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-Wing Storage, Non-SNM Door, and NDA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mentor:</td>
<td></td>
<td></td>
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<tr>
<td>Date:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mentor:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Building 9980:                                | OSR(s): _______ | Date: _____________________________ |
| Quality Control Operations                     |                | Mentor or Facility Rep: ___________ |
| Date:                                         |                |                                     |
| Mentor:                                       |                |                                     |

| Building 9818:                                | OSR(s): _______ | Date: _____________________________ |
| Operating area and Tank Farm                  |                | Mentor or Facility Rep: ___________ |
| Date:                                         |                |                                     |
| Mentor:                                       |                |                                     |

BFK.SHT (Rev. 4, 8/23/96)
<table>
<thead>
<tr>
<th>FACILITY</th>
<th>OSR DISCUSSION</th>
<th>FACILITY ORIENTATION COURSE OR TOUR</th>
</tr>
</thead>
</table>
| 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.  

BFK.SHT (Rev. 4. 8/23/96)
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 check sheet 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.

<table>
<thead>
<tr>
<th>Procedure/instruction</th>
<th>Revision</th>
<th>Date Discussed</th>
<th>Mentor</th>
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<tr>
<td>Y/DD-724</td>
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</table>

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: __________

**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.**

<table>
<thead>
<tr>
<th>EXTERNAL MONITORING TYPE</th>
<th>REVIEW OR SURVEY DESIGNATOR</th>
<th>OBSERVATION</th>
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<tr>
<td>Operational Review of Process Conditions</td>
<td>Mentor: ___________ Date: __________</td>
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<tr>
<td>Operational Review of Procedure Performance or Process Conditions</td>
<td>Mentor: ___________ Date: __________</td>
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</tr>
<tr>
<td>Area Survey</td>
<td>Mentor: ___________ Date: __________</td>
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</table>

T1.SHT (Rev. 3, 8/23/96)
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.

<table>
<thead>
<tr>
<th>EXTERNAL MONITORING TYPE</th>
<th>REVIEW OR SURVEY DESIGNATOR</th>
<th>PERFORMANCE</th>
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<tr>
<td>Operational Review of Process Conditions</td>
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<td></td>
<td>Date:</td>
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</table>

________________________ is recommended for task qualification in External Monitoring

Candidate/badge

Recommended by: ___________________________ Date: ____________

Group Leader

This form is approved for use __________________________

OC/O

 scrutiny (Rev. 3, 8/23/96)
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:

T2.SHT (Rev. 2, 8/23/96)
(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 evaluation, 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.

<table>
<thead>
<tr>
<th>Procedure/instruction</th>
<th>Revision</th>
<th>Date Discussed</th>
<th>Mentor</th>
</tr>
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<tr>
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<tr>
<td>Y/DD-683</td>
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</table>

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.

T2.SHT (Rev. 2, 8/23/96)
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.

<table>
<thead>
<tr>
<th>PART A REVIEW</th>
<th>PART B REVIEW</th>
<th>PART C REVIEW</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSA:</td>
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<tr>
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<td>Mentor:</td>
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<td>Mentor:</td>
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<tr>
<td>Date:</td>
<td>Date:</td>
<td>Date:</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>PART A REVIEW</th>
<th>PART B REVIEW</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSR:</td>
<td>CSR:</td>
</tr>
<tr>
<td>Mentor:</td>
<td>Mentor:</td>
</tr>
<tr>
<td>Date:</td>
<td>Date:</td>
</tr>
</tbody>
</table>

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.

T2.SHT (Rev. 2, 8/23/96)
<table>
<thead>
<tr>
<th>CSA/CSR</th>
<th>GOVERNING PROCEDURE</th>
<th>PERFORMANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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_________________________ is recommended for task qualification in NCS Evaluation and CSA Documentation

Candidate/badge

Recommended by: ___________________  Date: __________

Group Leader

This form is approved for use ____________________

T2.SHT (Rev. 2, 8/23/96)
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/issus 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.SHT (Rev. 3, 8/23/96)
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: __________


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.

<table>
<thead>
<tr>
<th>Procedure/instruction</th>
<th>Revision</th>
<th>Date Discussed</th>
<th>Mentor</th>
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<td>Y70-66-CS-332</td>
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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.

T3.SHT (Rev. 3, 8/23/96)
## Operating Procedure Approval

<table>
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<tr>
<th>Operating Procedure</th>
<th>Applicable CSAs/CSRs</th>
<th>Completion</th>
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__________ 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 Q/WO

T3.SHT (Rev. 3, 8/23/96)
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

T4.SHT (Rev. 3, 8/23/96)
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 \( k_{\text{eff}} \) 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 \( k_{\text{eff}} \pm 2\sigma \) does not overlap the Problem Solution \( k_{\text{eff}} \pm 2\sigma \) 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.

T4.SHT (Rev. 3, 8/23/96)
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.

<table>
<thead>
<tr>
<th>Procedure/instruction</th>
<th>Revision</th>
<th>Date Discussed</th>
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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.

T4.SHT (Rev. 3, 8/23/96)
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.

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<th>CODE</th>
<th>PROBLEM IDENTIFICATION</th>
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is recommended for task qualification in NCS Computations

Recommended by: __________________________ Date: __________

Group Leader

T4.SHT (Rev. 3. 8/23/96)
**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.

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<th>CODE</th>
<th>COURSE COMPLETED</th>
<th>CODE USAGE</th>
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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.

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This form is approved for use ___________________ QVO

T4.SHT (Rev. 3. 8/23/96)
Nuclear Criticality Safety Mentoring Cheeksheet

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.

T5.SHT (Rev. 2. 8/23/96)
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.

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| 3.   |                        | Mentor: 
Date:        |
| 4.   |                        | Mentor: 
Date:        |

T5.SHT (Rev. 2. 8/23/96)
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.

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This form is approved for use ____________________

T5.SHT (Rev. 2, 8/23/96)
Nuclear Criticality Safety Mentoring Cheecksheet

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.

T6.SHT (Rev. 3, 8/23/96)
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: Sign-off 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.


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.

<table>
<thead>
<tr>
<th>CSA/CSR or PROBLEM</th>
<th>GOVERNING PROCEDURE</th>
<th>REVIEW</th>
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3. Review all Independent Technical Review Board (ITRB) Monthly Lessons Learned Reports issued over the past year and discuss with mentor.

Verified by: __________________ Date: __________

T6.SHT (Rev. 3, 8/23/96)
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 ____________________

T6.SHT (Rev. 3. 8/23/96)
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 from 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.

T7.SHT (Rev. 0, 3/15/96)
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 prepareness and response and discuss with mentor.

<table>
<thead>
<tr>
<th>Procedure/instruction</th>
<th>Revision</th>
<th>Date Discussed</th>
<th>Mentor</th>
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<tr>
<td>Y40-000 through 004</td>
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<td>Y40-66-CS-023</td>
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</table>

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

<table>
<thead>
<tr>
<th>ACCIDENT DISCUSSED</th>
<th>DISCUSSION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mentor: ____ Date: ______</td>
</tr>
</tbody>
</table>

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

   Verified by: ____________ Date: ________

T7.SHT (Rev. 0, 3/15/96)
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 ________________

POV

T7.SHT (Rev. 0, 3/15/96)
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: __________

T8.SHT (Rev. 0, 3/15/96)
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.

<table>
<thead>
<tr>
<th>Procedure/instruction</th>
<th>Revision</th>
<th>Date Discussed</th>
<th>Mentor</th>
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<tbody>
<tr>
<td>DOE Order 5480.24</td>
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<td>FS-102</td>
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<td>NMC Model GA-6 Manual</td>
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<td>YTS-1407</td>
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<td>YSS-101</td>
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</table>

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: __________

T8.SHT (Rev. 0. 3/15/96)
Candidate/badge

Recommended by: ___________________________ Date: ________

Group Leader

This form is approved for use R.G. Taylor

T8.SHT (Rev. 0, 3/15/96)
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.

<table>
<thead>
<tr>
<th>Procedure/instruction</th>
<th>Revision</th>
<th>Date Completed</th>
<th>Mentor</th>
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</thead>
<tbody>
<tr>
<td>ANSI/ANS 8 x standards</td>
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<td>DOE Order 5480 19, 20A, 24</td>
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<td>Applicable CFR’S</td>
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<td>T9.SHT (Rev. 0, 3/15/96)</td>
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</tbody>
</table>
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 ANSI/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 __________________________

QMD

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.

<table>
<thead>
<tr>
<th>Procedure/instruction</th>
<th>Revision</th>
<th>Date Completed</th>
<th>Mentor</th>
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<tbody>
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<td>Y/DD-683</td>
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<tr>
<td>ITRB Lessons Learned</td>
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<td>Y70-66-CS-332</td>
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____________________ is recommended for task qualification for the Independent Technical Review Board

Recommended by: ___________________ Date: ____________

Group Leader

This form is approved for use ____________________

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.

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  

T11.SHT (Rev. 1, 8/23/96)
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 ____________________

F12.SHT (Rev. 0. 3/15/96)
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: __________

T13.SHT (Rev. 0. 3/15/96)
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)
   - Atmospheric Release Advisory Capability (ARAC)
   - Federal Radiological Monitoring and Assessment Center (FRMAC)
   - Radiation Emergency Assistance Center/Training Site (REAC/TS)
   - Radiological Assistance Program (RAP)
   - Aerial Measuring System (AMS)
   - Nuclear Emergency Search Team (NEST)

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:

[Signature] is recommended for task qualification for EOC Support

Candidate/badge

Recommended by: Date:

Group Leader

This form is approved for use

This form is approved for use [Signature]

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

YIDD-694, Qualification Program, Nuclear Criticality Safety Department

YIDD-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

TQR.FRM (Rev. 2, 8/23/96)
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 1, 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 Expenanced Personnel Evaluation Board:

The purpose of Expenanced Personnel Evaluation is to examine previous experience with similar task activities to determine whether or not Mentonng Checklist and Checksheet items are considered satisfied. To accomplish the evaluation, an Expenanced 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 Expenanced 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 Expenanced 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 Expenanced 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 Expenenced Personnel Evaluation Board, its completion assigned to the candidate, and completed by the candidate to the satisfaction of the mentor.

D. The Expenenced Personnel Evaluation will be documented using the Expenenced 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 ___________________________

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

Items addressed:

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

Items addressed:

EPE.FRM (Rev. 2, 8/23/96)
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

EPE.FRM (Rev. 2, 8/23/96)
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 an 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:

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<th>Question</th>
<th>Rating</th>
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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: ________________________
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: __________

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Approvals: ____________________________ QVO ________ Date __________

_________________________ NCSD Superintendent __________ Date __________
NUCLEAR CRITICALITY SAFETY DEPARTMENT
CONTINUING TECHNICAL TRAINING RECORD

NCSD Staff Member: ___________________  Badge: __________

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<th>REQUIRED READING COMPLETE (DATE)</th>
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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.

<table>
<thead>
<tr>
<th>NAME</th>
<th>NCS ENGINEER IN TRAINING</th>
<th>NCS ENGINEER</th>
<th>NCS SPECIALIST</th>
<th>TECHNICAL SPECIALIST</th>
<th>COMMENTS</th>
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### 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.

<table>
<thead>
<tr>
<th>NAME</th>
<th>EXTERNAL MONITORING (2)</th>
<th>NCS EVALUATION &amp; DOCUMENT</th>
<th>OPERATE PROCEDURE REVIEW (2)</th>
<th>NCS COMPUTE (1)</th>
<th>NCS COMPUTE REVIEW (1)</th>
<th>NCS EVALUATION &amp; DOCUMENT REVIEW</th>
<th>EMERGENCY RESPONSE PLANNING</th>
<th>CAAS SUPPORT</th>
<th>COMPLIANCE &amp; NCS PROCEDURE</th>
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**NOTE 1:** Code indicated on Table 3  
**NOTE 2:** Functional area indicated on Table below

### Functional Area Qualification for Tasks 3 and 6

<table>
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<th>NAME</th>
<th>METALS</th>
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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.

<table>
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<tr>
<th>NAME</th>
<th>ITRB MEMBER</th>
<th>NCS DOCUMENT APPROVAL</th>
<th>NCS PROG OVERSIGHT</th>
<th>EOC SUPPORT</th>
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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.

<table>
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<tr>
<th>NAME</th>
<th>KENO-IV</th>
<th>KENO-IV General Geometry</th>
<th>KENO Va with BONAMI/NITAWI</th>
<th>MONK</th>
<th>MCNP</th>
<th>XRSRNPMP</th>
<th>DOT</th>
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Distribution:

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