U.S. DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE

PAGE CHANGE

NV 56XG.1 Chg 1

Approved: 10-28-98

Subject: SUBCRITICAL EXPERIMENT

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1. EXPLANATION OF CHANGE. To set forth intended requirements to be applied to Management and Operating Contractors and National Laboratories in Attachment 1, Contractor Requirements Document.

2. FILING INSTRUCTIONS.

Remove Pages	Dated	Insert Pages	Dated
Page 1	6-16-97	Page 1	10-28-98
None		Attachment 1, Pages 1-4	

G. W. Johnson
Manager

U.S. DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE

ORDER

NV 56XG.1 Chg 1

Approved: 06-16-97
Review Date: 06-16-99
Expires: 06-17-01
Change 1: 10-28-98

Subject: SUBCRITICAL EXPERIMENTS

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1. PURPOSE. Provide policy and direction and establish authorities and responsibilities for the U.S. Department of Energy's (DOE) Subcritical Experiment Program conducted at the Nevada Test Site (NTS). This Order outlines the life-cycle process to ensure the timely and successful accomplishment of tasks consistent with planning, design, fielding, authorization, safe execution, evaluation, and results of a subcritical experiment.

2. SCOPE.

   a. The provisions of this Order apply to organizational elements of the DOE Nevada Operations Office (DOE/NV), DOE/NV contractors and subcontractors, associated agencies, and NTS users.

   b. Contractor Requirements are contained in the Contractors Requirements Document, Attachment 1.

3. EXEMPTIONS. None.

4. REFERENCES. Refer to Chapter IV.

5. DEFINITIONS. Refer to Chapter V.

6. POLICY. Subcritical experiment activities will be carried out under the authority from the Secretary of Energy and guidance from the Assistant Secretary for

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INITIATED BY:
Stockpile Stewardship Division

Defense Programs (DP-1), and in accordance with the Record of Decision for the final Environmental Impact Statement for the NTS and Off-Site Locations in the State of Nevada that describe subcritical experiments at the NTS. These operations will be conducted subject to programmatic approval provided by DP-1, and execution authority provided by the Deputy Assistant Secretary for Research and Development (DP-10), DOE Headquarters (DOE/HQ).

7. OBJECTIVES.

   a. Field and conduct experiments in a manner that protects the health and safety of on-site workers and the general public.

   b. Conduct experiments in a manner that precludes an unauthorized, or accidental, release of special nuclear material.

   c. Comply with applicable environmental laws and regulations.

   d. Conduct experiments to acquire, collect, and record data for use in developing accurate, detailed theoretical models and understanding of the underlying physical phenomenon important to weapon performance and safety in concert with computational simulations, data from past nuclear tests, and from nonnuclear experiments to better model or validate weapons design for the Science-Based Stockpile Stewardship Program.

   e. Conduct operations and experiments within available funding provided by DOE.

   f. Maintain the nuclear test readiness posture as described in NV Order 56XE.1B, as required.

   g. Document and archive experiment information as a historical record.

8. RESPONSIBILITIES AND AUTHORITIES.

   a. DOE/NV Manager is responsible for the safe conduct of the Subcritical Experiment Program. The DOE/NV Manager:

      (1) Charters the Safety Evaluation Panel and appoints a panel chairperson.

      (2) Appoints DOE Test Controllers and provides guidance and direction to them.

(3) Approves nominated individuals to serve as members of the Test Controller's Scientific Advisory Panel and Laboratory Test Directors.

(4) Requests execution authority from DP-10.

(5) Approves the public information release policy related to each subcritical test.

(6) Serves as the Energy Senior Official in the event of an accident.

(7) Delegates authorities and assigns operational responsibilities, as necessary, to the Directors of the Los Alamos National Laboratory (LANL) and the Lawrence Livermore National Laboratory (LLNL) and Test Directors, as necessary, to conduct the Subcritical Experiment Program.

b. Assistant Manager for Business and Financial Services. Provides contract administration for contracts and interagency agreements relative to essential support services required for the program such as geology, meteorology, and off-site radiological safety.

c. Assistant Manager for Technical Services. Provides necessary engineering, environment, safety, health protection, asset management, and security support.

d. Assistant Manager for National Security (AMNS).

(1) Serves as the principal line manager responsible for subcritical experiments ensuring that activities necessary for the safe conduct of an experiment are met.

(2) Provides the Manager with scientific and management advice and assistance in the development and implementation of policies, programs, and projects in support of subcritical experiments.

(3) Charters and appoints the Experiment (Criticality) Review Panel chairperson.

(4) Charters and appoints the Containment Review Panel chairperson.

(5) Authorizes the receipt, storage, assembly, disassembly, movement, emplacement, and sealing of special nuclear material on the NTS.

(6) Provides the Health Physics Advisor to the Test Controller's Scientific Advisory Panel.

e. Director, Office of Public Affairs and Information (OPAI).

(1) Provides a public announcement and public affairs support to the Subcritical Experiment Organization.

(2) Provides Subcritical Experiment Program Classification Policy.

(3) Provides visitor coordination support on transparency issues for each experiment.

f. Director, Safeguards and Security Division (SSD).

(1) Provides a Security Advisor to the Subcritical Experiment Organization.

(2) Administers the Special Nuclear Material Management Program.

(3) Approves security plan(s) related to subcritical operations and facilities.

(4) Coordinate with federal and local law enforcement agencies, ensuring availability of backup response.

g. Director, Safety and Health Division.

(1) Provides an Occupational Safety Advisor to the Subcritical Experiment Organization.

(2) Provides a Radiological Operations Officer to the Subcritical Experiment Organization.

h. Director, Environmental Protection Division.

(1) Administers the Interagency Agreement with the U.S. Environmental Protection Agency (EPA), Office of Radiation and Indoor Environments National Laboratory (R&IE), Las Vegas, providing necessary resources for off-site emergency preparedness and response, as required.

(2) Prepares and submits requested and/or annual reports to state and federal agencies meeting Comprehensive Environmental Response,

Compensation, and Liability Act and National Emission Standards for Hazardous Air Pollutants or other regulatory requirements.

i. Director, Stockpile Stewardship Division (STD).

(1) Provides a project manager for each experiment.

(2) Provides a Test Operations Officer, Test Liaison Officer, a Test Readiness Project Manager, and an Air Operations Officer to the Subcritical Experiment Organization.

(3) Prepares the experiment execution authority request package for each subcritical experiment and submits it to the DOE/NV Manager for further submission to DP-10.

(4) Prepares authorization to receive, store, assemble, disassemble, move, emplace, and seal; and submits it to the AMNS and advises the Test Controller.

(5) Provides technical and administrative support to the Containment Review Panel. Ensures conclusions and recommendations of the Containment Review Panel are recorded and included in the experiment execution authority request package.

(6) Provides technical guidance and direction under the Interagency Agreement with the U.S. Geological Survey (USGS) to ensure that the geological and hydrological information pertinent to containment is made available to appropriate DOE organizations, laboratories, and the Containment Review Panel.

(7) Provides technical guidance and direction under the Interagency Agreement with National Oceanic and Atmospheric Administration (NOAA), Air Resources Laboratory (ARL)/Special Operations and Research Division (SORD), to ensure proper meteorological and climatological support to the Subcritical Experiment Program.

(8) Maintains the official record copy of experiment files.

(9) Administers the Containment Review Panel member consultant agreements.

j. Director, Defense Projects Division (DPD). Provides a member, knowledgeable of DPD projects, to the Subcritical Experiment Organization.

k. Director, Engineering and Asset Management Division.

(1) Provides an NTS Construction Craft Support Representative to the Subcritical Experiment Organization.

(2) Provides matrix engineering and logistical support to the DOE/NV Project Manager for experiment program preparation, execution, and post-experiment activities.

(3) Operates the Operations Coordination Center in support of subcritical experiments.

l. Director, Emergency Management Division.

(1) Provides management for transparency issues.

(2) Provides an Emergency Management Representative to the Subcritical Experiment Organization.

(3) Ensures that the DOE/NV Emergency Operations Center is fully operational and staffed to support a subcritical experiment according to plans and procedures.

(4) Ensures that the DOE/NV Emergency Management System is prepared for the on-site transportation of high explosives and the conduct of a subcritical-experiment.

m. Program Manager, Nuclear Explosive Safety (NES) Staff.

(1) Provides a chairperson, reporting to the DOE/NV Manager, for the DOE/NV Safety Evaluation Panel.

(2) Provides field reviews of each subcritical experiment to ensure that the process established by the sponsoring laboratory is being followed as directed by the AMNS and/or the Test Controller.

(3) Provides a Subcritical Experiment Safety Advisor, as required.

n. Directors, LANL or LLNL.

(1) Direct the design, fielding, and technical aspects of subcritical experiments.

(2) Provide explosives and special nuclear material for each subcritical experiment.

(3) Provide a Test Director for each subcritical experiment.

(4) Provide a Scientific Advisor to the Subcritical Experiment Organization to serve as chairperson of the Test Controller's Scientific Advisory Panel.

(5) Fulfill responsibilities and authorities as delegated by the DOE/NV Manager, as necessary, for the Subcritical Experiment Program.

(6) In the event of an operational emergency, provides trained consequence assessment personnel to the NTS Emergency Management Center's Consequence Assessment Group.

o. Director, EPA/R&IE, Las Vegas. Provides an advisor to the Subcritical Experiment Organization and an independent radiological surveillance and safety program in the off-site areas, as required.

p. Director, NOAA, ARL/SORD.

(1) Directs meteorological support for the Subcritical Experiment Program.

(2) Serves as, or provides a Meteorological Advisor member of the Test Controller's Scientific Advisory Panel.

(3) Provides an ARL/SORD Experiment Support Meteorologist and a Hazardous Materials (HAZMAT) Meteorological Support Specialist to brief and support the Subcritical Experiment Organization.

q. Program Coordinator, NTS Weapons Program, USGS. Ensures an independent review of the experiment site geology and hydrology, and the containment prospectus for the subcritical experiment, as required.

r. U.S. Air Force/DOE Liaison Office. Provides a liaison officer to the Subcritical Experiment Organization, as required.

s. Test Controller.

(1) Ensures the safe conduct of each experiment in compliance with the DOE/NV Manager's Delegation of Authority memorandum; DOE and DOE/NV Directives, Orders, Notices; instructions; announcements; written policy and guidance; containment plans; and applicable treaties, rules, and regulations.

(2) Has operational control, including environment, safety, and health (ES&H) coordination authority, of the NTS during the experiment execution period; and has the authority to proceed with, accelerate, delay, or postpone experiments, as may be necessary.

(3) Approves the on-site radiological monitoring plan as prepared by the sponsoring national laboratory.

(4) Notifies the National Response Center of experiment execution by telephone, to meet requirements of the Comprehensive Environmental Response, Compensation, and Liability Act.

t. Subcritical Experiment Organization. An organization formed for the purpose of conducting subcritical experiments. The composition of the Subcritical Experiment Organization may be readily adjusted or changed in response to the needs and technical objectives of the DOE Subcritical Experiment Program or for meeting requirements supporting the nuclear test readiness posture.

The Subcritical Experiment Organization is typically comprised of the following positions:

(1) Test Controller.

(2) Test Director.

(3) Test Controller's Scientific Advisory Panel.

(a) Scientific Advisor.

(b) U.S. EPA Off-Site Radiological Safety Officer, as required.

(c) NOAA ARL/SORD Meteorological Advisor.

(d) Medical Advisor.

(e) Health Physics Advisor.

(4) NOAA ARL/SORD Experiment Support Meteorologist.

(5) NOAA ARL/SORD HAZMAT Meteorological Support Specialist, as required.

(6) U.S. EPA Radiological Safety Program Project Officer.

(7) Air Force Liaison Officer.

(8) Radiological Operations Officer.

(9) NTS Construction/Craft Support Representative(s).

(10) Security Advisor.

(11) Subcritical Experiment Safety Advisor, as required.

(12) DOE/NV Emergency Management Representative.

(13) Test Operations Officer.

(14) Test Readiness Project Manager.

(15) Test Liaison Officer.

(16) DOE/NV Subcritical Experiment Project Manager.

(17) Air Operations Officer.

(18) Public Affairs Specialist.

(19) Laboratory Containment Scientists.

(20) Occupational Safety Advisor.

(21) Other DOE/NV, contractor or laboratory support personnel as required.

The responsibilities and authorities of these positions are described in NTS-SOP 1102, Nuclear Test Organization.

9. REQUIREMENTS. Refer to Chapters I through III.

10. PROCEDURES. Each organization participating in the preparation or execution activities of a subcritical experiment shall have plans and procedures necessary to ensure compliance with applicable federal regulations, DOE and NV Orders, Directives, Announcements, Procedural Instructions, and NTS-SOPs.

G. W. Johnson
Manager

CONTRACTOR REQUIREMENTS DOCUMENT

NATIONAL LABORATORY REQUIREMENTS.

1. Either the Los Alamos National Laboratory (LANL) or the Lawrence Livermore National Laboratory (LLNL), i.e., the sponsoring nuclear design laboratory, shall:

   a. Ensure that the respective laboratory organization participating in the preparation or execution activities of each subcritical experiment shall have plans and procedures necessary to ensure compliance with applicable Federal regulations, DOE and NV Orders, Directives, Announcements, Procedural Instructions, and Nevada Test Site (NTS) Standard Operating Procedures (SOP); and that its responsibilities and activities as assigned in the Test Controller's Operations and Security Plan are completed as scheduled and reported to the Test Controller through the Test Operations Officer.

   b. Provide for the design, fielding, and technical aspects of each subcritical experiment.

   c. Provide explosives and special nuclear material for each subcritical experiment.

   d. Provide a Test Director for each subcritical experiment.

   e. Provide a Scientific Advisor to the Subcritical Experiment Organization to serve as chairperson of the Test Controller's Scientific Advisory Panel.

   f. Fulfill responsibilities and authorities as delegated by the DOE Nevada Operations Office (DOE/NV) Manager in the annual delegation letter for the Subcritical Experiment Program.

   g. In the event of an operational emergency, provide trained consequence assessment personnel to the NTS Emergency Management Center’s Consequence Assessment Group.

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h. Provide appropriate criticality analysis to DOE/NV's Experiment Review Panel (ERP) to establish that the experiment does not constitute a nuclear test or hydronuclear experiment, and that there is no reasonable likelihood that criticality will be achieved in the experiment.

i. Provide a safety analysis of each subcritical experiment to DOE/NV's Safety Evaluation Panel in accordance with NV 56XH.1, to ensure that all related assembly, storage, transportation, insertion, and emplacement activities are safe.

j. Analyze site characterization data, prepare a containment design, and prepare and present a containment prospectus to DOE/NV's Containment Review Panel in accordance with the "Containment Review Panel Charter" to ensure that no nuclear material releases will take place that could endanger workers or the public.

k. Obtain approval from the Assistant Manager for National Security (AMNS) per the requirements of NTS-SOP 5613 prior to the receipt of special nuclear material at the NTS.

l. Prepare and submit for approval to DOE/NV Safeguards and Security Division (SSD), an Experiment Security Plan which conforms to the requirements of the "Site Safeguards and Security Plan" prior to delivery of the special nuclear material to the experiment site.

m. Submit to SSD the category and attractiveness level of the materials involved prior to delivery of the special nuclear material to the experiment site. If the category of the materials and/or the sponsoring laboratory require a convoy to the experiment execution site, the convoy will be conducted in accordance with DOE/NV approved procedures.

n. Conduct a successful dry run prior to the Test Director declaring technical readiness for special nuclear material and high explosives to be delivered to the experiment site. This dry run shall include all applicable experiment organizations.

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o. Obtain permission from AMNS per NTS-SOP 5614 prior to delivery of the high explosive and special nuclear material or high explosives to the experiment site.

p. Ensure that delivery and insertion are in accordance with the approved Subcritical Experiment Safety Evaluation Panel Report in accordance with NV 56XH.1.

q. Obtain permission from AMNS to place the special nuclear material and high explosive in an irreversible position prior to sealing the material per the requirements of NTS-SOP 5614.

r. Prepare and implement a plan for on-site radiological monitoring appropriate to the hazards of the subcritical experiment. The plan shall be approved by the DOE/NV Test Controller.

s. Prepare a reentry plan that shall be presented for approval to the Test Controller and Scientific Advisory Panel.

2. The Test Director shall:

a. Provide a classified briefing of the significant technical aspects of the experiment to the Test Controller and Scientific Advisory Panel prior to the D-1 Readiness Review.

b. Brief the Test Controller and Scientific Advisory Panel at the D-1 Readiness Review regarding the technical readiness to proceed with the experiment.

c. Conduct a successful final dry run prior to requesting authority to prearm the special nuclear material and high explosives.

d. Provide another briefing to the Test Controller and Scientific Advisory Panel on the day of the planned experiment execution regarding the technical readiness for experiment execution. This briefing shall include the Test Director's declaration of a successful final dry run.

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e. Ensure that high explosive arming and firing is conducted in accordance with the approved Subcritical Experiment Safety Evaluation Panel Report.

f. Ensure that prearming activities do not proceed until authorized by the Test Controller.

g. Ensure that the countdown sequence does not proceed until a zero time has been established and permission to fire has been granted by the Test Controller.

h. After obtaining authorization for reentry from the Test Controller, ensure that reentry is in accordance with the approved reentry plan.

3. The other nuclear design laboratory shall provide appropriate confirming criticality analysis and/or peer review to the ERP.

4. Independent containment scientists from both LANL and LLNL shall review the "As-Built" Containment Plan prior to the D-1 Readiness Review and shall provide formal statements to the Test Controller and Scientific Advisory Panel regarding their assessment of the "As-Built" containment.

NTS M&O CONTRACTOR REQUIREMENTS.

1. The NTS management and operations (M&O) Contractor shall:

a. Ensure that the necessary plans and procedures are in place to ensure compliance with applicable Federal regulations, DOE and NV Orders, Directives, Announcements, Procedural Instructions, and NTS-SOPs; and that it’s responsibilities and activities as assigned in the Test Controller's Operations and Security Plan are completed as scheduled and reported to the Test Controller through the Test Operations Officer.

b. Provide engineering design, construction, and project management support, meeting the criteria of the sponsoring laboratory, as approved by the DOE/NV Project Manager.

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c. Conduct emplacement and sealing operations at the technical direction of the laboratory Test Director.

d. Provide inspection services of all experiment site construction.

e. Provide, a knowledgeable representative to brief the Test Controller and Scientific Advisory Panel regarding the "As-Built" Containment Plan prior to the D-1 Readiness Review to ensure conformance to the approved plan as presented to the Containment Review Panel. This briefing shall include a formal statement by the NTS contractor which emplaced the containment barriers regarding their assessment of the "As-Built" containment.

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CHAPTER I

GENERAL REQUIREMENTS

1. DOE HEADQUARTERS. For the Subcritical Experiment Program that includes high explosives and that may or may not include special nuclear material, DOE/HQ has specifically directed the laboratory program managers and technical staff to coordinate and support program proposals with DOE/NV in regards to the following:

   Programmatic Approval. On an annual basis, DOE/NV shall obtain approval from DP-1 on plans for dynamic experiments at the NTS that include high explosives and that may or may not include special nuclear material. This approval process is to ensure the objectives of the planned activities are consistent with national policy and the Defense Programs (DP) mission, consistent with relative DP priorities, and within approved budget targets. Each experiment proposed must be consistent with the current NTS Environmental Impact Statement.

   The process is initiated by submitting a program proposal to the DP-10, no later than July 1 of the year prior to the fiscal year in which activities are planned. This program submission shall address, where applicable, the following:

   a. Technical objectives of the experiments.

   b. Relationship to DP missions.

   c. Experiment descriptions and/or sketches.

   d. Quantities of special nuclear material, if any.

   e. Planned diagnostic instrumentation.

   f. Emplacement and other operational aspects.

   g. Scheduled date.

   h. Public Affairs aspects.

   DP-1 will issue a message by August 1 providing authorization for the program as submitted, or will indicate necessary modifications.

For activities that do not involve the use of special nuclear material, no additional authorization by DOE/HQ is required for those activities to proceed. However, any major changes in plans for those experiments, including objectives, configuration, emplacement, schedule, or unusual public affairs aspects, should be communicated to the Office of Research and Testing DP-16 before implementation.

For each experiment, before it is placed in an irreversible state and no later than 6 weeks prior to its scheduled date, written permission to conduct the experiment must be requested from DP-10. This authorization will be contingent on assurance that the following additional requirements have been accomplished:

a. Experimental Review. For each experiment, assurance must be obtained that it does not constitute a nuclear test or hydronuclear experiment, in which case, other procedures will apply. To accomplish this, analysis must be conducted by the appropriate technical staff from the laboratory designing the experiment to establish that there is no reasonable likelihood that criticality will be achieved in the experiment, as designed. The analysis and findings are to be reviewed by the other nuclear design laboratory. Finally, a positive statement must be issued by the AMNS attesting to the validity of the findings.

b. Safety. For each experiment, to ensure that all related assembly, storage, transportation, insertion, and emplacement activities are safe, the appropriate safety analysis of operations must be completed in accordance with the Draft NV Order 56XH.1.

c. Containment. For each experiment, to ensure that no nuclear material releases will take place that could endanger workers or the public, an analysis must be conducted of the measures taken to contain the energy and material expected from the experiment. Prior to authorization from DP-10 to conduct the experiment, a positive statement must be issued by the DOE/NV AMNS asserting that there is no reasonable likelihood that, as a result of the experiment, exposures of workers or the public will exceed the appropriate standards.

For activities that involve special nuclear material, any major changes in plans, including experimental objectives, configuration, emplacement, schedule, or unusual public affairs aspects, should be communicated to DP-10 before proceeding.

2. DOE/NV MANAGER. The DOE/NV Manager has been assigned responsibility and authority for:

a. Ensuring that personnel participating in the preparation or conduct of a subcritical experiment possess the experience, knowledge, and skills that are necessary to discharge their responsibilities.

b. Obtaining programmatic approval from DP-1.

c. Requesting written execution authority from DP-10 a minimum of 6 weeks prior to the scheduled date for each experiment. Approval must be obtained before special nuclear material are emplaced in an irreversible state. The authorization is contingent upon statements by the AMNS affirming the completion of an experiment (criticality) review, safety analyses review, and containment review.

d. Receiving the required components and explosives and provide for their positive security, adequate storage, and necessary handling facilities at the NTS.

e. Ensuring that the containment design, emplacement, and firing of the high explosives shall be conducted so that the probability of the release of radioactivity is minimized.

f. Complying with reporting requirements under the provisions of Title 40 Code of Federal Regulations (C.F.R.) Part 61, the National Emission Standards for Hazardous Air Pollutants; and 40 C.F.R. Part 30, the Comprehensive Environmental Response, Compensation, and Liability Act.

g. Maintaining, through the OPAI, a Public Information Plan to conform with current DOE/NV public announcement policy as approved by DP-10.

3. PLANS AND PROCEDURES. Each organization participating in the preparation or execution activities of a subcritical experiment shall have plans and procedures necessary to ensure compliance with applicable DOE and NV Orders, Directives, Procedural Instructions, rules, regulations, and NTS-SOPs.

4. TRANSPARENCY POLICY. Each experiment will be conducted consistent with the DOE Policy for Transparency providing assurance to the public and international community that the experiments are consistent with the U.S. arms control commitments.

5. ES&H COORDINATION RESPONSIBILITY. ES&H responsibility will be assigned, for each experiment, to the laboratory Test Director and DOE/NV Test Controller per Draft NV Order 56XH.1.

CHAPTER II

EXPERIMENT REQUIREMENTS

1. SITE SELECTION. The location for subcritical experiment execution on the NTS will be the U1a Complex. In the event that another site is required, the site shall be selected and approved in accordance with DOE/NV Announcement 23, Environmental Protection Policy Statement, dated April 2, 1991; the Groundwater Protection Management Program Plan for DOE/NV, dated February 19, 1993; and the current Environmental Impact Statement.

2. SITE CHARACTERIZATION. Locations selected for proposed subcritical experiments within the U1a Complex or at another site will be characterized in accordance with NTS-SOP 5413.

3. CONTAINMENT DESIGN AND EVALUATION. The sponsoring laboratory shall analyze site characterization data, prepare a containment design, and prepare and present a containment prospectus to the Containment Review Panel in accordance with the "Containment Review Panel Charter."

4. EXPERIMENT SITE PREPARATION.

   a. The NTS contractor shall provide engineering design, construction, and project management support, meeting the criteria of the sponsoring laboratory, as approved by the DOE/NV Project Manager.

   b. Under authority delegated by the DOE/NV Manager, the sponsoring laboratory shall provide technical direction to the contractor, as necessary, to meet their scientific requirements.

5. RECEIPT, ASSEMBLY, DISASSEMBLY, AND STORAGE.

   a. Receipt or storage of special nuclear material may not occur on the NTS without written authorization by the AMNS in accordance with NTS-SOP 5613.

   b. Prior to any explosive operations commencing on a particular subcritical experiment, the NES Program Manager shall document that the requirements of Draft NV Order 56XH.1 have been completed incorporating the core safety management functions described in the DOE Implementation Plan. This

notification may be part of the DOE/NV response to a Subcritical Experiment Safety Study Panel report.

c. Assembly, disassembly, modification or storage of high explosives and special nuclear material together may not occur on the NTS without meeting requirements of Draft NV Order 56XH.1 and written authorization from the AMNS per NTS-SOP 5613.

d. Accountability of the special nuclear material will be performed by SSD's Special Nuclear Materials Representative in conformance with DOE Orders and/or DOE approved material control and accountability plans.

6. SPECIAL NUCLEAR MATERIAL DELIVERY AND INSERTION.

a. Prior to delivery of the special nuclear material to the experiment site, the Test Director shall prepare and submit for approval to DOE/NV's SSD, an Experiment Security Plan which conforms to the requirements of the "Site Safeguards and Security Plan."

b. Prior to delivery of the special nuclear material to the experiment site, the sponsoring laboratory will submit to the SSD the category and attractiveness level of the materials involved. If the category of the materials and/or the sponsoring laboratory require a convoy to the experiment execution site, the convoy will be conducted in accordance with DOE/NV approved procedures.

c. Prior to delivery of the high explosive and special nuclear material or high explosives to the experiment site, the laboratory Test Director shall obtain permission from the AMNS per NTS-SOP 5614.

d. The sponsoring laboratory shall ensure that delivery and insertion are in accordance with the approved Subcritical Experiment Safety Evaluation Panel Report in accordance with Draft NV Order 56XH.1.

7. EMPLACEMENT AND SEALING.

a. Prior to sealing, the laboratory Test Director shall obtain permission from the AMNS to place the special nuclear material and high explosive in an irreversible position.

b. Each subcritical experiment shall be sealed in accordance with the approved plans as presented to the Containment Review Panel.

c. NTS contractor shall conduct emplacement and sealing operations at the technical direction of the laboratory Test Director.

8. ON-SITE AND OFF-SITE MONITORING.

a. The EPA/R&IE shall prepare a plan and field a radiological monitoring team to support execution of each subcritical experiment, and during consequence assessment and management in the event of an operational emergency.

b. The sponsoring national laboratory shall prepare and implement a plan for on-site radiological monitoring appropriate to the hazards of the subcritical experiment. The plan shall be approved by the DOE/NV Test Controller.

c. The Director, NOAA ARL/SORD, shall ensure that appropriate personnel and meteorological monitoring systems are ready to support experiment execution.

9. EXPERIMENT EXECUTION.

a. Prior to scheduled experiment execution, the Test Operations Officer shall submit a DOE Test Controller's Operations and Security Plan to the Test Controller for approval.

b. The Test Controller's Operations and Security Plan shall ensure compliance with
DP-10's written policy and direction, and the DOE/NV Manager's written directions. This plan shall address the following, as appropriate:

(1) Experiment Location.

(2) Identification of Key Personnel.

(3) Meteorological Support.

(4) Radiological Safety.

(5) Planning and Safety Reviews.

(6) Manned and Stay-In Stations.

(7) Closed-Circuit Television.

(8) Geophones.

(9) Area Control Procedures.

(10) Aircraft Support.

(11) Environmental Reporting.

(12) Assignment and Schedule of Activities.

(13) Security Operations.

c. All participating organizations shall ensure that their responsibilities and activities as assigned in the Test Controller's Operations and Security Plan are completed as scheduled and reported to the Test Controller through the Test Operations Officer.

10. ARMING AND FIRING.

a. The Test Director shall ensure that high explosive arming and firing is conducted in accordance with the approved Subcritical Experiment Safety Evaluation Panel Report.

b. Prearming activities may not proceed until authorized by the Test Controller.

c. The countdown sequence may not proceed until a zero time has been established and permission to fire has been granted by the Test Controller.

11. REENTRY.

a. The Test Director shall prepare a reentry plan. This plan shall be presented for approval to the Test Controller and Scientific Advisory Panel.

b. When deemed safe and based upon monitored data, and recommendations from the Test Director and Scientific Advisory Panel, the Test Controller shall authorize reentry into the experiment site.

c. The Test Director shall ensure that reentry is in accordance with the approved reentry plan.

d. When deemed safe and appropriate, the Test Controller shall open closed areas of the NTS for normal work.

CHAPTER III

EXPERIMENT REVIEW REQUIREMENTS

1. PROGRAMMATIC REVIEW AND APPROVAL.

   a. Each year, a program proposal is submitted to DP-10. This proposal is submitted by July 1 for dynamic experiments including subcritical experiments at the NTS that include high explosives planned in the following fiscal year. Where applicable, the program proposal shall address technical objectives, relationship to DP missions, experiment device descriptions and/or drawings, quantities of special nuclear material, planned diagnostic instrumentation, emplacement, operational aspects, scheduled date(s), and public affairs aspects.

   b. Based on the review of the program proposal, DP-1 approves and provides authorization or will indicate any necessary modifications for the conduct of subcritical experiments at the NTS by August 1. This process is to ensure that the objectives of the planned activities are consistent with National Policy and DP missions, consistent with DP priorities, and within approved budget targets. Any major changes in plans, including experimental objectives, configuration, emplacement, schedule, or public affairs considerations, need to be communicated to DP-10 before proceeding.

2. EXPERIMENT (CRITICALITY) REVIEW. For each experiment, the AMNS will charter a Criticality Review Panel to analyze the proposed experiment, including criticality reviews from the sponsoring national laboratory and the other national laboratory. The AMNS will issue a positive statement attesting to the validity of the Panel's findings.

3. SUBCRITICAL SAFETY EVALUATION.

   a. For each subcritical experiment, the Program Manager, NES Staff, and the sponsoring laboratory will conduct a Subcritical Experiment Safety Evaluation in accordance with Draft NV Order 56XH.1. This evaluation is required to be approved and all issues resolved prior to conducting any special nuclear material and high explosive operations.

   b. The Program Manager, NES Staff, will ensure an "As-Built" review is conducted following the assembly of the special nuclear material and high

explosive. This review will verify that the special nuclear material and high explosive was assembled in accordance with the approved Subcritical Safety Evaluation.

4. CONTAINMENT REVIEW.

   a. A review of the sponsoring laboratory containment prospectus is conducted by containment consultants and DOE/NV staff. Comments related to containment issues are forwarded to the sponsoring laboratory for their consideration in the presentation of the containment design made to the Containment Review Panel.

   b. Based on the merits of the design, each panel member prepares a categorization statement, and the chairperson shall prepare a summary and a recommendation. This categorization package shall be forwarded to the AMNS. The AMNS will forward a positive statement to DP-10 as part of the execution authority request. This statement shall assert that measures have been taken to contain the energy and the materials from this experiment.

5. CONSTRUCTION REVIEWS.

   a. Experiment site design and construction drawings pertaining to the safe conduct of an experiment are reviewed and approved by the DOE/NV Project Manager, or a designated representative.

   b. The NTS contractor provides inspection services of all experiment site construction.

   c. The DOE/NV Project Manager conducts field reviews of construction in progress to ensure compliance with all construction standards, approved plans, specifications, and other requirements.

6. SECURITY REVIEWS. Prior to transportation of special nuclear material to the experiment site, SSD shall:

   a. Review and approve the laboratory Experiment Security Plan.

   b. Perform a security inspection of the experiment site and locations for security stations to ensure compliance with the approved plan.

c. Review and approve the NTS Security Contractor Convoy Plan, Laboratory Material Control and Accountability Plan, Intruder Interdiction Plan, and the Requisition for Security Services.

7. REVIEW FOR AUTHORITY TO RECEIVE, ASSEMBLE, DISASSEMBLE, OR STORE SPECIAL NUCLEAR MATERIAL AND HIGH EXPLOSIVES. Prior to the arrival of special nuclear material or special nuclear material and high explosives at the NTS and upon request from the sponsoring laboratory, the DOE/NV Project Manager shall:

   a. Verify with the NES Program Manager that the applicable subcritical safety evaluation panel report has been completed and approved.

   b. Verify with the Director, SSD, that applicable SSD requirements have been met.

   c. Prepare for the approval of the AMNS, an authority letter in accordance with NTS-SOP 5613.

8. EXECUTION AUTHORITY REVIEW.

   a. For each subcritical experiment, the DOE/NV Manager shall request execution authority from DP-10. The Execution Authority Request package shall include the following:

      (1) The Experiment (Criticality) Review Report.

      (2) The Containment Review Panel chairperson's recommendation, the Executive Secretary's containment summary, and a categorization statement from each Containment Review Panel member.

      (3) The Safety Evaluation Panel Report that includes or addresses the design prospectus, experiment specific hazard analysis, criticality, containment, a certification of completion of special nuclear material and high-explosives requirements, and other information as necessary.

      (4) Concurrence by the AMNS including positive statements or recommendations to the DOE/NV Manager.

   b. Upon receipt of the Execution Authority Request package from the DOE/NV Manager, DP-10 conducts an independent review of the proposed experiment prior to granting experiment execution authority.

9. REVIEW FOR AUTHORITY TO MOVE, EMPLACE, AND SEAL SPECIAL NUCLEAR MATERIAL AND HIGH EXPLOSIVES. Prior to the delivery of special nuclear material to the experiment site and in coordination with the Test Director, the Director, STD, shall:

    a. Verify that DP-10 has granted execution authority. If not, the Director, STD, should so advise the AMNS and request guidance before proceeding.

    b. Verify the Test Director has been approved by the Manager and delegated authority to conduct the requested operation.

    c. Verify with the Director, SSD, that all SSD requirements have been met.

    d. Verify with the NES Program Manager that all relevant safety requirements have been met.

    e. Prepare a letter from the AMNS authorizing the sponsoring laboratory to move, emplace, and seal the special nuclear material and high explosive for approval by the Test Controller.

10. DRY RUNS.

    a. Prior to the Test Director declaring technical readiness for the special nuclear material and high explosives to be delivered to the experiment site, the sponsoring laboratory shall conduct a successful dry run. This dry run shall include all applicable experiment organizations.

    b. Prior to the Test Director requesting authority to prearm the special nuclear material and high explosives, the sponsoring laboratory shall conduct a successful final dry run.

11. D-1 PLANNING AND SAFETY REVIEW. Before planned experiment execution, the Test Controller and Scientific Advisory Panel may conduct an informal review of operational plans and safety precautions to include:

    a. Experiment overview.

    b. Security interests.

    c. Transparency interests.

d. Area Control Plan.

e. Add-on projects, as required.

f. Post experiment manning assignments.

12. D-1 "AS-BUILT" CONTAINMENT REVIEW.

    a. Prior to the D-1 Readiness Review, the Test Controller and Scientific Advisory Panel shall review the "As-Built" Containment Plan to ensure conformance to the approved plan as presented to the Containment Review Panel. This shall consist of reviews and formal statements by independent containment scientists from both LANL and LLNL, and the NTS contractor which emplaced the containment barriers.

    b. If the Test Controller does not concur that the containment barriers have been emplaced in substantial conformance with the approved plan as presented to the Containment Review Panel, the experiment shall be delayed and the matter referred back to the Containment Review Panel.

    c. A verbatim record of this review, the Scientific Advisory Panel deliberation and recommendation, and the Test Controller decision may be made.

13. D-1 TECHNICAL REVIEW. Prior to the D-1 Readiness Review, the Test Controller and Scientific Advisory Panel shall receive a classified briefing of the significant technical aspects of the experiment from the Test Director. Based on this review and recommendation of the Scientific Advisory Panel, the Test Controller may authorize the experiment to proceed.

14. D-1 RANGE SAFETY REVIEW. Prior to the D-1 Readiness Review, the Test Controller and Scientific Advisory Panel may receive a classified briefing of operations on the U.S. Air Force ranges adjacent to the NTS. Based on this review, the Test Controller may authorize the experiment to proceed.

15. D-1 READINESS REVIEW. Prior to experiment execution, the Test Controller and Scientific Advisory Panel shall conduct a review of readiness for experiment execution. A verbatim record of this review, the Scientific Advisory Panel deliberation and recommendation, and the Test Controller decision may be made. This readiness review shall address:

    a. Confirmation of technical readiness by the Test Director.

b. NOAA ARL/SORD predicted meteorological conditions.

c. NOAA ARL/SORD prediction of the potential transport and dispersion pattern of radioactive and other hazardous materials in the unlikely occurrence of a release into the atmosphere.

d. DOE on-site radiological safety preparations.

e. EPA/R&IE off-site radiological safety preparations, as required.

f. NTS logistical support readiness.

g. Status of completed actions required by the Test Controller's Operations and Security Plan.

h. Status of preparation for future actions required by the Test Controller's Operations and Security Plan.

i. Area Control Plans.

j. Experiment support readiness.

16. D-DAY READINESS REVIEW.

a. On the day of the planned experiment execution, the Test Controller and Scientific Advisory Panel shall conduct another review of readiness for experiment execution. A verbatim record may be required of this review, the Scientific Advisory Panel deliberation and recommendation, and the Test Controller’s decision.

b. This review shall include all areas addressed in the D-1 Readiness Reviews with the addition of updated weather and the Test Director's declaration of a successful final dry run.

c. Based on the recommendations of the Test Director and the Scientific Advisory Panel, the Test Controller may authorize prearming of the high explosive.

d. Upon completion of prearming, the Test Controller shall ensure continued readiness in all respects prior to authorization to commence the countdown sequence.

CHAPTER IV

REFERENCES

1. DOE AND NV ORDERS.

   a. Draft DOE/NV Order 56XH.1, SUBCRITICAL EXPERIMENT SAFETY PROGRAM, of 1997.

   b. DOE/NV Order 56XE.1B, UNDERGROUND NUCLEAR TESTING, of 10-10-96.

2. NTS STANDARD OPERATING PROCEDURES.

   a. NTS-SOP 1102, NUCLEAR TEST ORGANIZATION, of 7-5-94.

   b. NTS-SOP 5413, CHARACTERIZATION OF EVENT SITES, of 9-3-93.

   c. NTS-SOP 5613, NEVADA TEST SITE PROCEDURE FOR AUTHORIZATION OF RECEIPT, ASSEMBLY, DISASSEMBLY, AND STORAGE OF NUCLEAR EXPLOSIVES, of 12-22-93.

   d. NTS-SOP 5614, MOVEMENT, EMPLACEMENT AND STEMMING OF NUCLEAR MATERIALS, of 7-17-95.

3. OTHER.

   a. Title 40 C.F.R. Part 61, National Emission Standards for Hazardous Air Pollutants (NESHAPs), of 11-15-90.

   b. Comprehensive Environmental Response, Compensation, and Liability Act, Public Law No. 96-510, of 12-11-80.

   c. Containment Review Panel Charter, issued 1-18-96.

   d. Site Safeguards and Security Plan, of 6-6-96.

   e. DOE/NV Announcement 23, Environmental Protection Policy Statement, of 4-2-91.

   f. Draft Management Plan for Subcritical Experiments, issued 9-4-96.

CHAPTER IV

REFERENCES
(Continued)

g. The Groundwater Protection Policy Statement, of 2-19-93.

h. Final Environmental Impact Statement for the NTS and Off-Site Locations in the State of Nevada, of 7-96.

i. Record of Decision on Management and Operations of the NTS and Off-Site Locations in the State of Nevada, of 12-9-96.

CHAPTER V

DEFINITIONS

1. AS-BUILT. A drawing or other record of a completed assembly or construction which indicates final condition as actually built including all differences from the approved design.

2. CERTIFICATION. The act of determining, verifying, and attesting in writing to the qualifications of personnel, processes, procedures, or items in accordance with specified requirements.

3. CONSEQUENCE ASSESSMENT GROUP. The on- and off-site consequences of a radiological operational emergency must be assessed by technical laboratory and contractor personnel who provide timely assessments and protective action recommendations throughout an emergency by monitoring specific indicators and evaluating field measurements.

4. CONTAINMENT REVIEW PANEL. The Containment Review Panel is an independent panel of containment experts, chartered by the DOE/NV Manager to approve the containment design for subcritical experiments based on the laboratory presentation and knowledge of established containment methods.

5. ENERGY SENIOR OFFICIAL. The DOE/NV official in charge of the response to a radiological emergency.

6. ES&H/RADIOLOGICAL SAFETY COORDINATION RESPONSIBILITY. Operational activities at the NTS are diverse involving the application of many different skills and occupational specialties and are often widely dispersed over a large geographical area. Several different organizations frequently perform work either as a closely integrated team or concurrently at any one location. In order to ensure that the appropriate procedures and policies are uniformly considered and applied by all of the program participants, one organization is assigned overall environment, safety, and health/radiological safety coordination responsibilities for that specific area or facility.

7. EXPERIMENT EXECUTION PERIOD. The period of time following the completion of the initial D-1 readiness briefing through the time when reentry into the experiment site is complete and the Test Controller announces that all areas are open.

8. EXPLOSIVE OPERATIONS. Those activities which require access to a explosive such as transportation, storage, assembly, disassembly, modification, and repair.

CHAPTER V

DEFINITIONS
(Continued)

9. HIGH EXPLOSIVE. Any assembly containing high explosive parts or propellants that may be capable of producing a detonation.

10. KEY POSITION. A subset of critical positions which are essential for the safe conduct of an underground nuclear test. Key positions have been analyzed through a defined job and task analysis, and have documented training and qualification programs for personnel assigned to these positions.

11. QUALIFICATION. The characteristics or abilities gained through education, training, or experience, as measured against established requirements, such as standards or tests, that qualify an individual to perform a required function.

12. SPECIAL NUCLEAR MATERIAL. Special nuclear material means plutonium or uranium enriched in the Isotope 233 or in the Isotope 235, and any other material which the Nuclear Regulatory Commission determines to be special nuclear material, or any material artificially enriched by any of the foregoing.

13. SUBCRITICAL EXPERIMENT. A dynamic experiment that involves the use of special nuclear material and does not achieve a condition of criticality, i.e., no self-sustaining fission chain reaction.