CONTROL FORM FOR DOE/ORO DIRECTIVE

PART A (To be completed by the ORO DIRECTIVES MANAGEMENT GROUP, AD-440):

1. **DIRECTIVE NUMBER, TITLE, AND DATE:**

   ORO G 420.13, REVISION 1, SAFETY BASIS DOCUMENTS REVIEW GUIDE, dated 08/31/2006

2. **PURPOSE OF TRANSMITTAL:** __ New Directive _X_ Revised Directive __ Revised Control Form

3. **DOES THIS DIRECTIVE CANCEL OR EXTEND ANY OTHER DIRECTIVES?** _X_ Yes __ No
   If "Yes," list what action (cancel or extend) and list the Directive(s) number(s), title(s), and date(s):

   This Directive cancels and replaces ORO G 420.13, SAFETY BASIS DOCUMENTS REVIEW GUIDE, dated 07/19/2004.

The attached Directive is forwarded for review and action. Complete Part B and forward a completed hard copy of this form to ORO DMG, AD-440, by **09/19/2006**.

PART B (To be completed by the DIVISION OF PRIMARY INTEREST [DPI]):

COMPLETE FOR DOE DIRECTIVES ONLY:

4. **SUPPLEMENTAL ORO DIRECTIVE REQUIRED?**
   Is a new or revised supplemental ORO Directive required? __ Yes __ No
   If "Yes," target date for submission of supplemental ORO Directive is _____.

COMPLETE FOR BOTH DOE AND ORO DIRECTIVES:

5. **CONTRACTOR APPLICABILITY.**

   Does this Directive affect the work performed by ORO Contractors? __ Yes _X_ No

   If "Yes," whom? __ Bechtel Jacobs Company LLC __ ORAU

   __ UT-Battelle, LLC __ ISOTEK (Bldg. 3019, ORNL)

   __ Foster Wheeler (FWENC)

   __ Other Contractors (list by name)

6. **SUBJECT MATTER EXPERT**: Roger Casteel (Name) Safety and Health Division, SE-33 (Organization)

7. **APPROVED BY**: *Original Signed By* J. A. Ferrer, Dir. (Signature) Safety and Health Division (Organization) 09/01/2006 (Date)

PART C (To be completed by the ORO DIRECTIVES MANAGEMENT GROUP, AD-440):

APPROVED FOR DISTRIBUTION IN ACCORDANCE WITH OFFICIAL DIRECTIVE DISTRIBUTION LIST:

Original Signed By
Jennifer G. Hamilton 09/01/2006
DMG Team Leader, AD-440 Date

INSTRUCTIONS TO ADDRESSEES: THIS FORM IS TO BE FILED WITH THE DIRECTIVE AND RETAINED. (Revised 02/10/2006)

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Guide

ORO G 420.13
Revision 1

SAFETY BASIS DOCUMENTS REVIEW GUIDE

August 31, 2006

Department of Energy

Assistant Manager for
Environment, Safety, and Health

REVISION LOG

Revision Number	Description of Revision	Approval Date
0	Initial issue. This Guide is a guidance document that may be used in conjunction with ORO O 420, Chapter XIII, SAFETY BASIS DOCUMENTS REVIEW SYSTEM, in the review and approval of safety basis documents and for assessing contractor's safety basis programs.	07/19/2004
1	Sunset review to reflect current organizational structure and responsibilities; update references to DOE and ORO Directives, Standards; and to add Specific Administrative Controls (SACs) as promulgated in DOE-STD-1186-2004.	08/31/2006

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1.0 PURPOSE.

The purpose of this Guide is to provide guidance to reviewers performing assessments and technical reviews of safety basis (SB) documents (e.g., Documented Safety Analyses [DSAs], Technical Safety Requirements [TSR], Unreviewed Safety Question [USQ] change packages, USQ procedures, Final Hazard Categorization Documents, Inactive Waste Site [IWS] documentation, and Justification for Continued Operations [JCOs]) and preparing Safety Evaluation Reports (SERs) and IWS Verification Reports (VRs) as required by Oak Ridge Office (ORO) ORO O 420, Chapter XIII, Change 3, SAFETY BASIS DOCUMENTS REVIEW SYSTEM, and the assigning line organization's review and approval process. Nothing in this guidance changes any requirements in any Department of Energy (DOE) or ORO Directive.

2.0 APPLICABILITY.

This document is for the use of ORO personnel who perform assessments and reviews of contractor SB documents.

3.0 RESPONSIBILITIES.

3.1 Assistant Manager for Environment, Safety, and Health.

3.1.1 Establishes and maintains this Guide and related ORO Directives and Policies that form the infrastructure for the overall SB document generation, assessment, review, and approval process.

3.2 Reviewer.

3.2.1 Performs assessments and reviews of the SB documents and prepares SERs/VRs documenting the review and basis for approval as required by ORO O 420, Chapter XIII, Change 3, and the assigning line organization's review and approval process.

NOTE: This Guide may be used in performing these assessments and reviews and preparing the SERs/VRs in conjunction with the assigning line organization's review and approval process.

4.0 SAFETY BASIS REVIEW PROCESS.

Once the need for a SB review has been determined, the responsible line Assistant Manager (AM) or designee appoints a reviewer(s) for the SB document(s).

The SB review process is provided in the assigning line organization's review and approval process.

NOTE: A flowchart of a suggested SB Review Process, as described below, is presented in Attachment 1.

4.1 <u>Initial Assessment</u>.

4.1.1 For DSAs and TSRs initially submitted to DOE ORO by contractors for new and existing Hazard Category 1, 2, or 3 nuclear facilities, including major modifications, the reviewer(s) assesses the DSA and TSR for compliance with 10 CFR 830, Subpart B, its implementation guides, and associated Safe Harbor Rules, Standards and Directives, technical accuracy, quality, and appropriateness. The reviewer(s) records the assessments on the quality metrics sheets.

4.1.2 The DSA and TSR Quality Metrics Assessment process and associated quality metrics sheets are provided in Attachment 2.

4.1.3 As part of the initial assessment, the reviewer(s) determines if the SB document is suitable for a detailed review. This should include the following steps, where applicable:

(a) Ensure that the appropriate contractor personnel have accomplished the review and approval of the SB document prior to submission to DOE.

(b) Verify that the appropriate safe harbor methodology described in 10 CFR 830, Subpart B, is used (i.e., DOE-STD-3009-94, Change Notice 3, PREPARATION GUIDE FOR U.S. DOE NONREACTOR NUCLEAR FACILITY SAFETY ANALYSIS, DOE-STD-3011-2002, GUIDANCE FOR PREPARATION OF BASIS FOR INTERIM OPERATION (BIO) DOCUMENTS, or DOE-STD-1120-2005, VOLUMES 1 AND 2, INTEGRATION OF ENVIRONMENT, SAFETY, AND HEALTH INTO FACILITY DISPOSITION ACTIVITIES).

(c) Ensure that SB documents have essential elements, such as base information; hazard and accident analysis (AA); safety structures, systems, and components (SSCs); and derivation of TSRs and programmatic controls.

4.1.4 If the submitted SB document(s) does not warrant a detailed review based in the initial assessment, the reviewer(s) notifies the facility's ORO Program/Project Manager(s) and Facility Representative(s) or responsible line personnel and the assigning AM. The reviewer(s) clearly documents the basis for rejecting the SB document(s) and provides the rejection basis, along with the initial assessment results, to the assigning Assistant Manager. The AM formally notifies the contractor, through the Contracting Officer's Representative (COR), that the document(s) cannot be reviewed along with the basis for the rejection in accordance with the assigning line organization's review and approval process.

4.2 <u>Review Team Selection</u>.

4.2.1 Once the reviewer(s) determines that the SB document is suitable for a detailed review, the reviewer(s), in consultation with the responsible line AM or designee, determines whether a review team is necessary based on the complexity and level of hazards at the facility.

4.2.2 When a review team is necessary, the reviewer(s) determines the makeup of the team. Consideration should be given to expertise needed to address the following areas, as applicable:

- Hazards/accident analysis process and techniques used in the SB document development;
- Technical subject matter experts, such as industrial hygiene, fire protection, nuclear criticality safety (NCS), radiological protection, emergency management, natural phenomena, and maintenance; and
- SB documentation requirements (DSAs, TSRs, hazard categorization, etc.).

4.2.3 If a review team is not required, the reviewer(s) should still involve subject matter experts to the extent they are necessary to conduct the review. In all cases, the Program/Project Manager(s) and Facility Representative(s) or responsible line personnel for the facility(ies) should be involved in the review.

4.2.4 DOE Headquarters (HQ) assistance should be requested, as needed, to supplement resources or acquire expertise that is locally unavailable.

4.3 <u>Review Plan</u>.

4.3.1 A review plan is required for new DSAs/TSRs, preliminary DSA submittals, USQ Procedure, or other significant SB document reviews for which the complexity of the facility or related issues warrants a review plan.

4.3.2 Review times for SB documents are established by the assigning AMs consistent with the expectations of the Approval Authority. Extensions beyond these time frames must be approved in advance by the Approval Authority.

4.3.3 When required, the reviewer(s) prepares a review plan. The Generic DSA/TSR Review Plan is provided in Attachment 3 for use in developing the review plan. Attachment 10 provides a review plan that can be used to review contractor's USQ Procedures. The review plan for SB documents should contain, as a minimum, the following information:

(a) Cover Page, indicating that the document is a review plan, the title of the document being reviewed and its associated document number and revision number, and the date of the review plan;

(b) Signature Page, the concurrence and approval signature requirements are provided in the assigning line organization's review and approval process;

(c) Expected review team composition;

(d) Estimated review schedule; and

(e) Review acceptance criteria as follows:

- Generic DSA/TSR review acceptance criteria is provided in Attachment 3.

- USQ Procedure requirements and DOE expectations are provided in Attachment 10.

4.3.4 Concurrence and approval of the review plan should be obtained as specified in the assigning line organization's review and approval process.

4.4 Steps for Reviewing Safety Basis Documents.

4.4.1 If the review process proceeds, the review team performs a walkthrough of the facility and discusses its operations with contractor management and facility personnel in order to gain familiarization of the facility and to verify that the hazards and controls identified in the SB document are correct and up to date.

NOTE: The facility's Program/Project Manager(s), Facility Representative(s), or responsible line personnel coordinates the facility walkthroughs and discussions with contractor management and facility personnel.

4.4.2 A technical review of the SB document should be conducted in accordance with criteria provided in DOE-STD-1104-96, Change Notice 3, REVIEW AND APPROVAL OF NUCLEAR FACILITY SAFETY BASIS DOCUMENTS (DOCUMENTED SAFETY ANALYSES AND TECHNICAL SAFETY REQUIREMENTS); ORO O 420, Chapter XIII, Change 3; the assigning organization's review and approval process, as well as, relevant references provided in Section 6.0 of this Guide. In all cases, technical information contained in the SB document should be verified as defensible (i.e., an adequate technical basis is provided and the analysis results are reproducible). Confirmatory calculations should be performed as necessary.

Considerations specific to various types of SB documents being reviewed, in addition to ORO O 420, Chapter XIII, Change 3, and the assigning line organization's review and approval process, are as follows:

(a) Final Hazard Categorization Documents. Hazard categorization documents provide the analytical basis for downgrading the hazard categorization of a facility from Hazard Category 2 or 3 to less than Hazard Category 3. Radiological material inventory and associated analyses, inventory adjustments, and assumptions provided in the final hazard categorization document (FHCD) should be reviewed to determine if they meet the requirements found in 10 CFR 830.202 and the guidance found in DOE-STD-1027-92, Change Notice 1 and DOE G 421.1-2, IMPLEMENTATION GUIDE FOR USE IN DEVELOPING DOCUMENTED SAFETY ANALYSIS TO MEET SUBPART B OF 10 CFR 830 (Chapter 5.1, *Development Of Hazard Categorization For Legacy Nuclear Facilities Without Inventory Information*). Attachment 4 provides further guidance for reviewing hazard categorization documents.

(b) Preliminary Documented Safety Analysis. Preliminary DSAs should be reviewed against the basic requirements found in 10 CFR 830.203 and the guidance found in DOE G 421.1-2 (Section 4.1.1, *Preliminary Documented Safety Analysis (PDSA)* and Section 5.2, *Topics for DSA*). Attachment 5 provides additional review guidelines for evaluating hazard/accident analysis and controls.

(c) Documented Safety Analysis. DSAs should be reviewed against the basic requirements found in 10 CFR 830.204, 10 CFR 830.207, the guidance found in DOE G 421.1-2 (Section 4.1.2, *Full Documented Safety Analysis [Final DSA]* and Section 5.2), and the information found in DOE-STD-1104-96, Change Notice 3. The hazard and accident analysis methodology should be consistent with the relevant 10 CFR 830 "safe harbor" approach and used, along with DOE-STD-1186-2004, SPECIFIC ADMINISTRATIVE CONTROLS, as the basis for designating safety-class or safety-significant SSCs and specific administrative controls (SACs) and the deriving TSR(s). Attachments 3 and 5 provide the generic DSA review acceptance criteria and additional review guidelines for evaluating hazard/accident analysis and controls. The DSA/TSR review should address the implementation period following approval and the appropriateness of the effective date.

(d) Technical Safety Requirements. A nonreactor nuclear facility TSR should be reviewed against the basic requirements found in 10 CFR 830.205 and the guidance provided in DOE G 423.1-1, IMPLEMENTATION GUIDE FOR USE IN DEVELOPING TECHNICAL SAFETY REQUIREMENTS as well as information found in DOE-STD-1104-96, Change Notice 3 and DOE-STD-1186-2004. Attachments 3 and 6 provide the generic TSR review acceptance criteria and the TSR expectations.

(e) Revisions to Safety Basis Documents. Review of SB document revisions should be focused on the submitted page change(s) and any other parts of the SB document affected.

(f) Annual Updates. Annual updates of SB documents should be reviewed against the requirements of 10 CFR 830.202 (c)(2), the guidance provided in DOE G 421.1-2 (Section 4.1.3, *Annual DSA Updates*), and the information found in DOE-STD-1104-96, Change Notice 3. The contractor's annual summaries of the USQ determinations should be evaluated to validate that the changes subject to the USQ determinations have been properly considered for the annual updates. Revisions or supplements to existing SERs may be used to document annual update reviews.

(g) Unreviewed Safety Question Change Package. Review USQ change packages against the requirements of 10 CFR 830.203 and the guidance provided in DOE G 424.1-1A, IMPLEMENTATION GUIDE FOR USE IN ADDRESSING UNREVIEWED SAFETY QUESTION REQUIREMENTS. A thorough review should be conducted of any affected facility SB documents.

(h) Justification for Continued Operations. JCO packages should be reviewed to ensure the following elements are provided and technically adequate:

- Background information to allow a full understanding of the nature and evolution of the safety issue.
- Identification of the affected SB document(s), with specific reference to the Sections that are impacted.
- Analysis of the hazards and potential consequences based on an understanding of the issues that necessitated the JCO.
- Interim controls proposed for controlling hazards and risks during the period of interim operation.
- A specific expiration date based on one or more of the following:
  - A specific USQ/analysis completion time line,
  - An aggressive condition correction,
  - A SB control being reinstituted,
  - A commitment to provide DOE a more complete analysis, and
  - The final safety evaluation to DOE and associated approval.
- A schedule for actions necessary to address resolution of the issue which necessitated the JCO.

Attachment 7 provides the content and applicability expectations for JCOs.

(i) Inactive Waste Site Documentation. The IWS documentation should be reviewed to ensure the DOE HQ IWS criteria are met (Memorandum from Roberson to DOE Field Sites, "*Hazard Categorization of Environmental Management Inactive Waste Sites as less than Hazard Category 3*," dated September 17, 2002). Attachment 8 provides guidance on the IWS Verification Report format and content.

(j) Nuclear Criticality Safety Not Credible Arguments. Attachment 9 provides the guidance for Nuclear Criticality Safety (NCS) not credible arguments.

(k) USQ Procedure. Contractors' USQ procedures and their revisions should be reviewed against the requirements of 10 CFR 830.203 and the guidance provided in DOE G 424.1-1A. Attachment 10 provides a suggested USQ Procedure Review Plan.

(l) Other Safety Basis Documents. Reviewers may be requested to review other types of SB documents, such as non-nuclear hazard analysis documents. The extent of the review necessary for these types of documents is a function of several characteristics, such as importance to safety, complexity, degree of standardization at the site, or similarity with evaluations previously performed on similar items. Reviews should be based on relevant DOE requirements, external regulations, and industry codes/standards, where applicable and

available. In general, documents should be judged on their completeness and the adequacy of the technical assumptions, analysis, references, and technical bases.

4.5 Comment Resolution.

4.5.1 The reviewer(s) and team members should consolidate their comments generated from the SB technical review and classify the comments as either essential or suggested. Attachment 11 provides techniques for commenting on SB documents.

4.5.2 The reviewer(s) promptly communicates comments and issues generated during the review with the facility's ORO Program/Project Manager(s) and Facility Representative(s) or responsible line personnel. The reviewer(s) elevates areas where agreement cannot be reached through the chain of command for resolution.

4.5.3 Appropriate comments/issues should be provided to the contractor, through the COR, for resolution in accordance with ORO O 420, Chapter XIII, Change 3, and the assigning line organization's review and approval process.

4.6 Safety Evaluation Report Preparation/Revision.

4.6.1 Preparation of the Safety Evaluation Report.

(a) The reviewer(s) obtains a unique, sequential identification number.

NOTE: The recommended SER number format is as follows:

SER-facility number-organization ID-year designator-sequential number (e.g., SER-3019A-SHD-03-05).

(b) The reviewer(s) should prepare the SER, with input from the team members.

(c) The SER should contain sufficient detail to justify the basis for a recommendation of approval or conditional approval of the safety basis document(s). In particular, the hazards and controls should be discussed in sufficient detail to provide the reader with an understanding of why the risk is acceptable. Avoid repeating technical information verbatim that is provided in the SB document.

(d) The SER should be prepared in accordance with the assigning organization's review and approval process and the guidelines provided in DOE-STD-1104-96, Change Notice 3, REVIEW AND APPROVAL OF NUCLEAR FACILITY SAFETY BASIS DOCUMENTS (DOCUMENTED SAFETY ANALYSIS AND TECHNICAL SAFETY REQUIREMENTS). Attachment 12 provides the recommended SER format and content based on DOE-STD-1104-96, Change Notice 3.

(e) For DSA/TSR reviews, the SER should discuss the DSA/TSR implementation and effective date.

4.6.2 Revision to the Safety Evaluation Report.

(a) An SER should be revised when the SB document has been significantly changed or a number of SER appendices have accumulated.

(b) The reason for the revision should be documented in the SER's revision log.

(c) SER revisions should be prepared in accordance with Section 4.6.1 above. The revision number is the same as the original SER number, with a revision suffix added (e.g., SER-3019A-SHD-03-05, Rev. 1).

4.6.3 Safety Evaluation Report Appendices.

(a) An Appendix to the SER should be prepared for a change to a SB document that would not require a comprehensive modification of the determination and documentation of its approval basis, such as:

(1) For the annual update of the SB documents,

(2) When the SB document has been specifically updated to address prior conditions of approval and requirements,

(3) For USQ change packages, or

(4) For JCOs.

(b) SER appendices should be prepared as specified in Section 4.6.1 above. The Appendix number is the same as the SER number, with an Appendix suffix added (e.g., SER-3019A- SHD-03-05, Appendix B).

(c) The reason for the Appendix to the SER should be documented in the SER's revision log.

4.6.4 Technical Review of Safety Evaluation Reports (including Revisions and Appendices).

The reviewer(s) provides the SER to the assigned technically qualified individual for peer verification and resolves any identified comments/issues. Issues/comments that cannot be resolved are elevated through the chain of command.

4.7 Dispute Resolution.

4.7.1 When comments or issues cannot be resolved among reviewer(s), review team members, individual performing the peer verification, and/or line management, the dispute should be elevated to management for resolution.

4.7.2 Disputes or disagreement related to the review of the SB document should be documented and retained in the SB file.

4.8 Approvals.

4.8.1 When the SER is ready for approval, the reviewer(s) provides the SER for concurrence and approval in accordance with the assigning line organization's review and approval process. (See ORO O 250, Chapter XI, Change 2, DELEGATIONS AND AGREEMENTS).

4.8.2 Once the Approval Authority approves the SER and associated SB document(s), an approval correspondence and a copy of the SER should be transmitted, through the COR, to the contractor in accordance with the assigning line organization's review and approval process and ORO O 420, Chapter XIII, Change 3. The transmittal correspondence should specify DOE's expectations for the implementation of the SB document.

5.0 RECORDS.

Requirements for records generated during the SB review process are provided in the assigning line organization's review and approval process and ORO O 420, Chapter XIII, Change 3.

6.0 REFERENCES.

(a) Title 10, Code of Federal Regulations, Part 830, NUCLEAR SAFETY MANAGEMENT.

(b) Title 10, Code of Federal Regulations, Part 830, Subpart B, SAFETY BASIS REQUIREMENTS.

(c) Title 10, Code of Federal Regulations, Part 835, OCCUPATIONAL RADIATION PROTECTION.

(d) Title 29, Code of Federal Regulations, Part 1910.120, HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE.

(e) Title 29, Code of Federal Regulations, Part 1926.65, HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE.

(f) U.S. Nuclear Regulatory Commission Regulation Guide 1.70, "*Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants.*"

(g) DOE O 231.1A, Change 1, ENVIRONMENT, SAFETY, AND HEALTH REPORTING, dated June 3, 2004.

(h) DOE M 411.1-1C, , SAFETY MANAGEMENT FUNCTIONS, RESPONSIBILITIES, AND AUTHORITIES MANUAL, dated December 31, 2003.

(i) DOE O 420.1B, FACILITY SAFETY, dated December 22, 2005.

(j) DOE G 421.1-2, IMPLEMENTATION GUIDE FOR USE IN DEVELOPING DOCUMENTED SAFETY ANALYSIS TO MEET SUBPART B OF 10 CFR 830, dated October 24, 2001.

(k) DOE G 423.1-1, IMPLEMENTATION GUIDE FOR USE IN DEVELOPING TECHNICAL SAFETY REQUIREMENTS, dated October 24, 2001.

(l) DOE G 424.1-1A, IMPLEMENTATION GUIDE FOR USE IN ADDRESSING UNREVIEWED SAFETY QUESTION REQUIREMENTS, dated July 24, 2006.

(m) DOE G 435.1-1, IMPLEMENTATION GUIDE FOR USE WITH DOE M 435.1-1, dated July 9, 1999.

(n) DOE O 460.1B, PACKAGING AND TRANSPORTATION SAFETY, dated April 4, 2003.

(o) DOE G 460.1-1, IMPLEMENTATION GUIDE FOR USE WITH DOE O 460.1A, PACKAGING AND TRANSPORTATION SAFETY, dated June 5, 1997.

(p) DOE O 461.1A, PACKAGING AND TRANSFER OR TRANSPORTATION OF MATERIALS OF NATIONAL SECURITY INTEREST, dated April 26, 2004.

(q) DOE M 461.1-1, Change 1, PACKAGING AND TRANSFER OF MATERIALS OF NATIONAL SECURITY INTEREST MANUAL, dated July 26, 2005.

(r) DOE-STD-1027-92, Change Notice 1, HAZARD CATEGORIZATION AND ACCIDENT ANALYSIS TECHNIQUES FOR COMPLIANCE WITH DOE ORDER 5480.23, NUCLEAR SAFETY ANALYSIS REPORTS, dated September 1997.

(s) DOE-STD-1104-96, Change Notice 3, REVIEW AND APPROVAL OF NUCLEAR FACILITY SAFETY BASIS DOCUMENTS (DOCUMENTED SAFETY ANALYSES AND TECHNICAL SAFETY REQUIREMENTS), dated December 2005.

(t) DOE-STD-1120-2005, Volumes 1 and 2, INTEGRATION OF ENVIRONMENT, SAFETY, AND HEALTH INTO FACILITY DISPOSITION ACTIVITIES, dated April 2005.

(u) DOE-STD-1186-2004, SPECIFIC ADMINISTRATIVE CONTROLS, dated August 2004.

(v) DOE-STD-3009-94, Change Notice 3, PREPARATION GUIDE FOR U. S. DEPARTMENT OF ENERGY NONREACTOR NUCLEAR FACILITY DOCUMENTED SAFETY ANALYSES, dated March 2006.

(w) DOE-HDBK-3010-94, Change Notice 1, Volumes I and II, AIRBORNE RELEASE FRACTIONS/RATES AND RESPIRABLE FACTIONS FOR NONREACTOR NUCLEAR FACILITIES, dated March 2000.

(x) DOE-STD-3011-2002, GUIDANCE FOR PREPARATION OF BASIS FOR INTERIM OPERATION (BIO) DOCUMENTS, dated December 2002.

(y) DOE-NA-STD-3016-2006, HAZARD ANALYSIS REPORTS FOR NUCLEAR EXPLOSIVE OPERATIONS, dated May 2006.

(z) ORO O 250, Chapter XI, Change 2, DELEGATIONS AND AGREEMENTS, dated August 22, 2006.

(aa) ORO O 420, Chapter XIII, Change 3, SAFETY BASIS DOCUMENTS REVIEW SYSTEM, dated August 31, 2006.

(bb) Memorandum from Knuth to Distribution, Subject: "*Document Of Example Technical Safety Requirement*," dated June 23, 1994.

(cc) DOE Assistant Secretary for Environmental Management (EM-1) Memorandum, "*Supplemental Environmental Management (EM) Guidance For Implementing 10 CFR 830, Subpart B, Safety Basis Requirements*," dated May 28, 2002.

(dd) DOE Letter to Bechtel Jacobs Company LLC (Paul Clay), "*Format And Expectations For Justification For Continued Operations*," dated November 7, 2001.

(ee) Memorandum from Roberson to DOE Field Sites, "*Hazard Categorization Of Environmental Management Inactive Waste Sites As Less Than Hazard Category 3"*, dated September 17, 2002.

(ff) ANSI 8.1 – 1983, NUCLEAR CRITICALITY SAFETY IN OPERATIONS WITH FISSIONABLE MATERIALS OUTSIDE REACTORS.

7.0 ACRONYMS AND DEFINITIONS.

7.1 Acronyms.

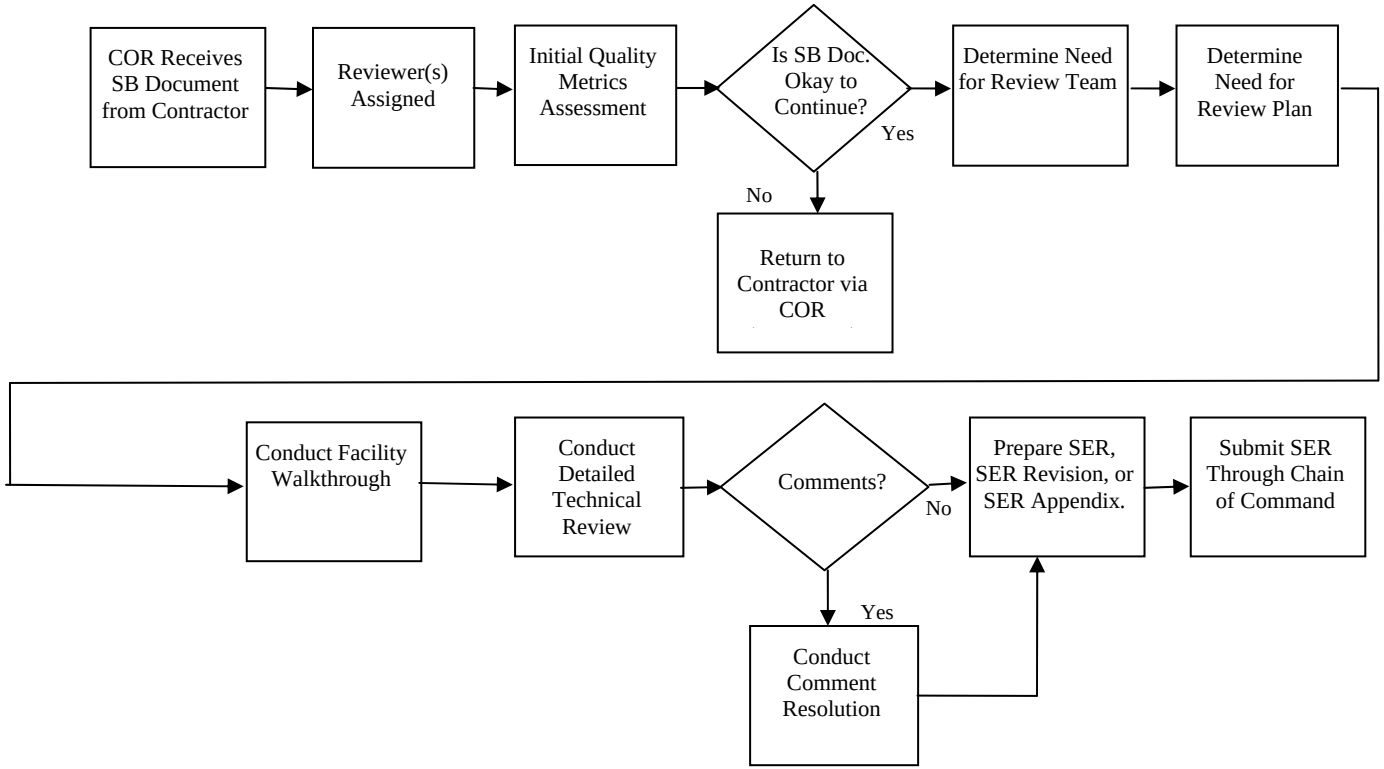
AA	Accident Analysis
AC	Administrative Control
AM	Assistant Manger
AMESH	Assistant Manager for Environment, Safety, and Health
ARF	Airborne Release Fraction
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COR	Contracting Officer's Representative
D&D	Decontamination and Decommissioning
DF	Design Feature
DID	Defense-in-depth
DOE	Department of Energy
DSA	Documented Safety Analysis
EG	Evaluation Guideline
EMHA	Emergency Management Hazard Assessment
ERPG	Emergency Response Planning Guideline
FHA	Fire Hazard Analysis
FHCD	Final Hazard Categorization Document
HA	Hazard Analysis
HQ	Headquarters
IP	Implementation Plan
ISMS	Integrated Safety Management System
IWS	Inactive Waste Site
JCO	Justification for Continued Operations
LCO	Limiting Conditions for Operation
LCS	Limiting Control Setting

LPF	Leak Path Factor
MAR	Material at Risk
MEI	Maximally-Exposed Collocated Worker
MOI	Maximally-Exposed Offsite Idividual
N	No
N/A	Not Applicable
NCS	Nuclear Criticality Safety
NPH	Natural Phenomena Hazard
ORO	Oak Ridge Office
PISA	Potential Inadequate Safety Analysis
PPE	Personal Protective Equipment
RCRA	Resource Conservation and Recovery Act
RF	Respirable Fraction
SAC	Specific Administrative Control
SB	Safety Basis
SC	Safety Class
SER	Safety Evaluation Report
SL	Safety Limit
SMP	Safety Management Program
SR	Surveillance Requirement
SS	Safety Significant
SSC	Structures, Systems, and Components
TEDE	Total Effective Dose Equivalent
TQ	Threshold Quantity
TSR	Technical Safety Requirements
USQD	Unreviewed Safety Question Determination
USQ	Unreviewed Safety Question
VR	Verification Report
X/Q	Atmospheric Relative Concentration
Y	Yes

7.2 Definitions.

Definitions utilized for this Guide are primarily found in ORO O 420, Chapter XIII, Changer 3. Supplemental definitions not found in that Directive are prescribed in the respective guidance document.

SAFETY BASIS DOCUMENT REVIEW PROCESS



DOCUMENTED SAFETY ANALYSIS AND TECHNICAL SAFETY REQUIREMENTS QUALITY METRICS CRITERIA

1.0 PURPOSE.

1.1 To establish the method and grading criteria for the initial assessment of Documented Safety Analyses (DSAs) and Technical Safety Requirements (TSRs) submitted by contractors for review by the Department of Energy (DOE) Oak Ridge Office (ORO) and approval by the designated Approval Authority.

1.2 To encourage future improvements in DSAs and TSRs by providing feedback to the contractors.

1.3 To provide input for consideration in awarding fee to contractors.

2.0 DISCUSSION.

2.1 This procedure specifies requirements for the assessment of DSAs and TSRs initially submitted to DOE-ORO by contractors for new and existing Hazard Category 1, 2, or 3 nuclear facilities, including major modifications, for compliance with 10 CFR 830, Subpart B, its implementation guides, and associated Safe Harbor Rules, Standards and Directives. Additionally, the assessments rate the technical adequacy, quality, and appropriateness of DSAs and TSRs in:

- Describing the facilities, their structures, systems, and components, and their operations;
- Identifying the facilities' hazards;
- Analyzing the hazards;
- Selecting controls commensurate to risk posed by the hazards and defining the associated safety functions, system descriptions, functional requirements, and system evaluations; and
- Flowing the selected controls into the TSR.

After the initial assessment, a detailed review of the submitted DSA and TSR will be conducted by the reviewer(s) unless this initial assessment identifies deficiencies that warrant rejecting the submitted documents.

2.2 Responsibilities.

2.2.1 Line Assistant Managers.

a. Assign the assessments of DSAs and TSRs to reviewers that meet the qualification requirements of Section 3.1.

b. Track, trend, and monthly report the results of the DSA and TSR assessments.

c. May administratively assign designees for these responsibilities.

2.2.2 Reviewer(s).

a. Reviews and grades assigned DSAs and TSRs for compliance with 10 CFR 830, Subpart B, its implementation guides, and associated Safe Harbor Rules, Standards and Directives and to verify their technical adequacy, quality, and appropriateness.

b. Submits completed DSA and TSR Quality Metric Sheets to the assigning Line Assistant Manager (AM) or designee.

c. Prepares correspondence to the contractor, as necessary, based on the assessment results.

3.0 INSTRUCTIONS.

3.1 Qualifications.

3.1.1 Reviewers should satisfactorily complete the training and qualification requirements for Safety Evaluation Report Preparers and Transportation Experts contained in the ORO Safety Basis Office/Facility-Specific Qualification Standard.

3.1.2 Reviewers should complete recurrent training as required by the ORO Safety Basis Office/Facility-Specific Qualification Standard to refresh or enhance their knowledge of the assessment process.

3.2 Assessing Documented Safety Analyses and Technical Safety Requirements.

3.2.1 The responsible line AM or designee assigns DSAs and TSRs initially submitted to DOE-ORO by contractors for new and existing Hazard Category 1, 2, or 3 nuclear facilities, including major modifications, to the reviewers. DSAs and TSRs should be assessed within two weeks after their submittal to facilitate the monthly quality metrics report.

3.2.2 The reviewer(s) reviews the DSA and TSR for compliance with 10 CFR 830, Subpart B, its implementation guides, and associated Safe Harbor Rules, Directives and Standards and to verify technical adequacy, quality, and appropriateness. Key attributes to be assessed includes the facility description; hazard identification; hazard and accident analysis; control selection; delineation of safety functions, system descriptions, specific administrative controls (SACs), functional requirements, and system and SAC evaluations; derivation of TSR controls; and presentation of controls in the TSR. The assessment should be based on the information provided in the submitted DSA and TSR as well as referenced analytical calculations, fire hazard analyses, emergency management hazard assessments, and other supporting documents.

3.2.3 The reviewer(s) documents the results of the assessment on Appendix A (Documented Safety Analysis Quality Metrics Sheet) and Appendix B (Technical Safety Requirements Quality Metrics Sheet) in accordance with Section 3.3.

3.2.4 Reviewer(s) provides the completed DSA and TSR Quality Metrics Sheets to the assigning line AM or designee.

3.2.5 Correspondence from the Contracting Officer's Representative to the contractor should be prepared for the assigning AM outlining deficiencies that result in DOE-ORO being unable to approve or complete a detailed review of the DSA or TSR.

3.3 <u>Completion of DSA and TSR Quality Metrics Sheets</u>.

3.3.1 The reviewer(s) documents the results of the assessment of a DSA on Appendix A (Documented Safety Analysis Quality Metrics Sheet) and of a TSR on Appendix B (Technical Safety Requirement Quality Metrics Sheet). These completed quality metrics sheets establish the basis for DSA and TSR performance indicators for each item requiring a response and provide specific criteria to be considered in the assessment of the DSAs and TSRs. The performance rating criteria is described below:

Superior - Attribute exceeds requirements and is well written, logical, and technically correct.

Satisfactory - Attribute meets all requirements as written, with or without comments, but should incorporate any minor corrections.

Needs Minor Improvement - Attribute requires minor changes or additional information to meet all requirements; thus, minor revision is necessary to fully meet established requirements.

Needs Major Improvement - Attribute requires major revision to meet all requirements although the approach is adequate.

Unsatisfactory - Attribute or approach is technically incorrect or information is incomplete or inadequate to comply with 10 CFR 830, Subpart B, its implementation guides, and associated Safe Harbor Rules, Standards and Directives.

3.3.2 The reviewer(s) assigns the following numerical values to the above rating criteria:

5 pts. - Superior

4 pts. - Satisfactory

3 pts. - Needs Minor Improvement

2 pts. - Needs Major Improvement

1 pt. - Unsatisfactory

3.3.3 For attributes that are assessed at unsatisfactory (1 point) or needs major improvement (2 points), provide justification for the rating on the Quality Metrics Sheet along with example(s), if available, to support the low rating.

3.3.4 If an item is not applicable (N/A), check the box in the column "N/A." Points will not be assigned to this item.

3.3.5 For an item with Yes ("Y") and No ("N"), "Y" means that the attribute in the DSA or TSR was correct and "N" means that the attribute was incorrect. Assign 5 points for "Y" and 1 point for "N".

3.3.6 The overall quality rating for the DSA or TSR will be derived by summing the numerical values of applicable items and dividing that total by the number of applicable items.

3.3.7 The performance objectives below establish a basis for such assessments:

Green (Superior) -	**Overall DSA or TSR Rating > 4.75**
White (Satisfactory) -	**4.0 < Overall DSA or TSR Rating ≤ 4.75**
Yellow (Marginal) -	**3.5 < Overall DSA or TSR Rating ≤ 4.0**
Red (Unsatisfactory) -	**Overall DSA or TSR Rating ≤ 3.5**

3.4 Revising DSA and TSR Quality Metrics.

In the course of performing the detailed review of the initially submitted DSA or TSR, new information may come available that would change the initial assessment. The reviewer(s) may revise the quality metrics sheet for the DSA or TSR to reflect the new information or more thorough understanding of the document's quality. The reviewer(s) provides the revised DSA or TSR Quality Metrics Sheet to the assigning line AM or designee.

3.5 Reporting Performance Indications.

The responsible line AM or designee collects the Quality Metrics Sheets for DSAs and TSRs sent by the reviewers during the month and sorts them accordingly by the contractor that prepared the DSAs and TSRs. The overall ranking for the DSAs and TSRs for each contractor are then averaged together to determine the overall contractor quality rating for the month. The results are provided in a monthly report to ORO management.

The information from the Quality Metrics Sheets can track and trend performance and be used by management to assess specific programmatic strengths and weaknesses.

4.0 REFERENCES.

(a) Title 10, Code of Federal Regulations (CFR), Part 830, NUCLEAR SAFETY MANAGEMENT.

(b) Title 29, Code of Federal Regulations, Part 1910.120, HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE.

(c) Title 29, Code of Federal Regulations, Part 1926.65, HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE.

(d) U.S. Nuclear Regulatory Commission Regulation Guide 1.70,"*Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants.*"

(e) DOE G 421.1-2, IMPLEMENTATION GUIDE FOR USE IN DEVELOPING DOCUMENTED SAFETY ANALYSES TO MEET SUBPART B OF 10 CFR 830, dated October 24, 2001.

(f) DOE G 423.1-1, IMPLEMENTATION GUIDE FOR USE IN DEVELOPING TECHNICAL SAFETY REQUIREMENTS, dated October 24, 2001.

(g) DOE O 460.1B, PACKAGING AND TRANSPORTATION SAFETY, dated April 4, 2003.

(h) DOE O 461.1A, PACKAGING AND TRANSFER OR TRANSPORTATION OF MATERIALS OF NATIONAL SECURITY INTEREST, dated April 26, 2004.

(i) DOE G 460.1-1, IMPLEMENTATION GUIDE FOR USE WITH DOE O 460.1A, PACKAGING AND TRANSPORTATION SAFETY, dated June 5, 1997.

(j) DOE M 461.1-1, Change 1, PACKAGING AND TRANSFER OF MATERIALS OF NATIONAL SECURITY INTEREST MANUAL, dated July 26, 2005.

(k) ORO O 420, Chapter XIII, Change 3, SAFETY BASIS DOCUMENTS REVIEW SYSTEM, dated, August 31, 2006.

(l) DOE-STD-1027-92, Change Notice 1, HAZARD CATEGORIZATION AND ACCIDENT ANALYSIS TECHNIQUES FOR COMPLIANCE WITH DOE ORDER 5480.23, NUCLEAR SAFETY ANALYSIS REPORTS, dated September 1997.

(m) DOE-STD-1104-96, Change Notice 3, REVIEW AND APPROVAL OF NUCLEAR FACILITY SAFETY BASIS DOCUMENTS (DOCUMENTED SAFETY ANALYSES AND TECHNICAL SAFETY REQUIREMENTS), dated December 2005.

(n) DOE-STD-1120-2005, Volumes 1 and 2, INTEGRATION OF ENVIRONMENT, SAFETY, AND HEALTH INTO FACILITY DISPOSITION ACTIVITIES, dated April 2005.

(o) DOE-STD-1186-2004, SPECIFIC ADMINISTRATIVE CONTROLS, dated August 2004.

(p) DOE-STD-3009-94, Change Notice 3, PREPARATION GUIDE FOR U.S. DEPARTMENT OF ENERGY NONREACTOR NUCLEAR FACILITY DOCUMENTED SAFETY ANALYSES, dated March 2006.

(q) DOE-STD-3011-2002, GUIDANCE FOR PREPARATION OF BASIS FOR INTERIM OPERATION (BIO) DOCUMENTS, dated December 2002.

(r) DOE-NA-STD-3016-2006, HAZARD ANALYSIS REPORTS FOR NUCLEAR EXPLOSIVE OPERATIONS, dated May 2006.

Documented Safety Analysis Quality Metrics Sheet Revision: _____

DSA Number: _____
Facility Name: _____
Facility Number: _____
AM Organization: _____
Reviewer's Name: _____

	Sup	Sat	Needs Minor Impr	Needs Major Impr	Unsat	N/A
I. Base Information. [17%]						
A. Site Characteristics completely described and sufficiently detailed to indicate all aspects of potential hazards/events, affects of adjacent facilities or operations, or proximity to potential receptors? • Clearly identifies the location of the site, facility within the site, proximity to the public and other facilities, and maximally exposed offsite individual? • Sufficiently describes site in terms of meteorology, hydrology, geology, seismology, and other natural phenomena to the extent needed for HA and AA? • Clearly identifies nearby airports, railroads, utilities such as natural gas lines, and other potential accident sources? • Clearly identifies nearby facilities impacting or impacted by the subject facility?	☐	☐	☐	☐	☐	☐
B. Facility Description completely described and sufficiently detailed and consistent with actual facility arrangements and operations to indicate all aspects of the facility, type and scope of operations, operational processes, structures, systems, and components, and the associated radiological and hazardous materials? • Sufficiently describe the facility's structure and design basis or evaluation basis, including construction details, materials, dimensions, and layouts to the extent needed to support the HA and AA? • Sufficiently describe the facility's process systems and components, and their operating parameters; confinement systems; safety support systems including their purpose; utilities; and auxiliary systems and support facilities? • Comprehensively identify the types and quantities of radiological and hazardous materials?	☐	☐	☐	☐	☐	☐

Documented Safety Analysis Quality Metrics Sheet

DSA No. _____

	Sup	Sat	Needs Minor Impr	Needs Major Impr	Unsat	N/A
I. Base Information (*continued*).						
C. Complete description of the facility's inputs, outputs, life cycle stage, mission(s), scope of operations, history, projected future uses, and design of safety structures, systems, and components in sufficient detailed to indicate the impact on the facility safety basis (SB)?	☐	☐	☐	☐	☐	☐
D. Provides the basis for and provisions of exemptions, consent agreements, and open issues?	☐	☐	☐	☐	☐	☐
E. Provides sufficient and complete base information to allow evaluation of the more specific aspects (e.g., hazard and accident analyses) of the facility SB?	☐	☐	☐	☐	☐	☐
F. Comprehensively identifies the hazards by type, quantity, form, and location including any difference between modes of operation and the hazards and quantities are consistent with those assumed in the FHA and EMHA?	☐	☐	☐	☐	☐	☐
G. Hazard quantities are derived from credible bases in a reasonably conservative manner?	☐	☐	☐	☐	☐	☐
II. Hazard and Accident Analyses. [37%]						
A. Initial and final hazard categories are assigned for the facility consistent with DOE-STD-1027-92, Change Notice 1, and any differences between final and initial hazard category are explained?	☐	☐	☐	☐	☐	☐
B. HA and AA methodology is explicitly stated and consistent with the safe harbor analysis methodology appropriate for this DSA?	☐	☐	☐	☐	☐	☐
C. HA and AA initial conditions and assumptions are clearly presented, appropriate, and justified?	☐	☐	☐	☐	☐	☐

Documented Safety Analysis Quality Metrics Sheet

DSA No. _____

	Sup	Sat	Needs Minor Impr	Needs Major Impr	Unsat	N/A
II. Hazard and Accident Analyses (*continued*).						
D. HA evaluates the full spectrum of normal, abnormal, and accident conditions, including natural and man-made external events, identified facility hazards, and those identified hazards flowing forward from the FHA?	☐	☐	☐	☐	☐	☐
E. HA identifies energy sources and processes that contribute to the generation or uncontrolled release of radioactive or other hazardous materials?	☐	☐	☐	☐	☐	☐
F. HA clearly presents public and worker unmitigated (uncontrolled) consequences and frequencies for postulated events and clearly defines their bases and discusses the HA results in terms of environmental protection?	☐	☐	☐	☐	☐	☐
G. Comprehensively identifies preventive and mitigative features for the postulated events?	☐	☐	☐	☐	☐	☐
H. Logic behind assessing the HA results in terms of safety-significant SSCs and SACs and designation of TSR requirements is understandable and internally consistent?	☐	☐	☐	☐	☐	☐
I. Appropriately selects representative and unique events from the HA results for further quantitative evaluation in the AA based on the consequence significance and frequency ranking and selected AA events capture all the controls associated with accidents that could challenge the EG?	☐	☐	☐	☐	☐	☐
J. AA quantitatively evaluates the selected representative and unique scenarios; clearly describes each scenario; provides the functions of preventive and mitigative features associated with each scenario; accurately reflects the referenced calculations and studies; analyses are reasonably conservative and clearly specify the final source term for each scenario; and results clearly present the unmitigated (uncontrolled) public consequence and frequency of the events?	☐	☐	☐	☐	☐	☐
K. Basis explicitly provided for all major parameters (e.g., MAR, ARF, RF, DR, LPF, DCF, X/Q)?	☐	☐	☐	☐	☐	☐

Documented Safety Analysis Quality Metrics Sheet

DSA No. _____

	Sup	Sat	Needs Minor Impr	Needs Major Impr	Unsat	N/A
II. Hazard and Accident Analyses (*continued*).						
L. Clearly identifies safety-class SSCs and SACs and defense in depth controls for selected events that challenge the Evaluation Guideline?	☐	☐	☐	☐	☐	☐
M. Appropriately dispositions the need for analysis of accidents that may be beyond the design or evaluation basis of the facility?	☐	☐	☐	☐	☐	☐
N. Appropriately selects the controls based on the HA and AA results using the hierarchy of SSCs over ACs, passive over active, preventive over mitigative, controls closest to the hazard, facility SSCs over personal protective equipment, controls that are effective for multiple hazards?	☐	☐	☐	☐	☐	☐
O. Set of selected controls is adequate to avoid uncontrolled release of hazardous material; avoid worker fatality, serious injury, or significant radiological or chemical exposure to workers; reduce public exposure to a small fraction of the EG; reasonable and prudent prevention and mitigation for potential environmental releases and to ensure controls are not seriously challenged and/or will likely maintain their functionality?	☐	☐	☐	☐	☐	☐
III. Safety Structures, Systems, and Components. [17%]						
A. Appropriately identifies safety SSCs and SACs as either safety-class or safety-significant and provides the bases for their selection (i.e., identifies the accident(s) for which they are needed) consistent with the logic presented in the HA and AA?	☐	☐	☐	☐	☐	☐
B. Clearly and concisely defines the safety function for each safety SSC or SAC consistent with the bases derived in the HA and AA and identifies the specific accidents the safety SSC or SAC impacts?	☐	☐	☐	☐	☐	☐
C. Provides a detailed description of each safety SSC or SAC that specifies the basic principles by which it performs its safety function; specifies the boundaries and interface points with any other SSCs relevant to its safety function?	☐	☐	☐	☐	☐	☐

Documented Safety Analysis Quality Metrics Sheet

DSA No. _____

	Sup	Sat	Needs Minor Impr	Needs Major Impr	Unsat	N/A
III. Safety Structures, Systems, and Components (*continued*).						
D. Clearly and concisely defines the functional requirements for each safety SSC or SAC consistent with the identified safety function and provides evidence that the safety function can be performed; specifies failure modes and the actions needed to prevent failure; and provides the response parameters or environmental stresses it must function?	☐	☐	☐	☐	☐	☐
E. Clearly defines the system evaluation (performance requirements) for the safety SSCs and SACs consistent with the identified safety function and provides evidence that the safety function can be performed (appropriately includes system descriptions, drawings, specifications, surveillances, maintenance, and requisite operator training and qualification associated with the vital safety systems and for SACs includes the specific operational responses and capabilities, processes that validates the responses can be performed within the timeframes assumed in the safety basis, and analysis of human performance factors)?	☐	☐	☐	☐	☐	☐
F. Appropriately designates support SSCs, relied upon by safety SSCs and SACs to perform their safety function, as either safety-class or safety-significant (the support SSC is designated at the same level as the supported safety SSC or SAC)?	☐	☐	☐	☐	☐	☐
G. For each safety SSC or SAC and needed support SSC, clearly defines the TSR requirements needed to ensure the safety function of the SSC or SAC is met?	☐	☐	☐	☐	☐	☐
IV. Derivation of Technical Safety Requirements. [17%]						
A. Selected preventive and mitigative controls, assumptions, and initial conditions from HA and AA and the Safety SSC Chapter have been comprehensively addressed?	☐	☐	☐	☐	☐	☐
B. The rationale for selecting each TSR control (e.g., SLs, LCSs, LCOs, ACs, SACs, DFs) is clearly and comprehensively described and consistent with the HA and AA and identifies the accident scenario(s) for which it is based?	☐	☐	☐	☐	☐	☐

Documented Safety Analysis Quality Metrics Sheet

DSA No. _____

	Sup	Sat	Needs Minor Impr	Needs Major Impr	Unsat	N/A
IV. Derivation of Technical Safety Requirements (*continued*).						
C. Each selected AC associated with a Safety Management Program is appropriately tailored for any facility or activity-specific application?	☐	☐	☐	☐	☐	☐
D. The rationale for selecting each TSR control is consistent with the control selection hierarchy and defense-in-depth philosophy or appropriate explanation is provided for any deviations?	☐	☐	☐	☐	☐	☐
E. Provides sufficient information on the operational facility modes and segmentation/process areas that impact the applicability of selected controls?	☐	☐	☐	☐	☐	☐
F. Provides sufficient information on performance expectations for the SSC or SAC selected from the HA/AA, performance criteria, vendor or design specifications, parameters, etc. to derive surveillance requirements (testing, inspections, calibrations, etc.) that ensure operability of the SSC or performance of SAC as established in the associated SL, LCS, LCO, or SAC (Specific "Directive Actions")?	☐	☐	☐	☐	☐	☐
G. Appropriately identifies controls from TSRs of other facilities or activities whose operations can impact this facility?	☐	☐	☐	☐	☐	☐
V. Safety Management Program Characteristics. [7%]						
A. Appropriately identifies and clearly describes the elements of institutional programs and facility management that are necessary to ensure safe operations based on the HA/A results?	☐	☐	☐	☐	☐	☐
B. Generic portions of the SMPs are consistent with previously agreed to site-wide or generic manuals/documents?	☐	☐	☐	☐	☐	☐
C. Facility or activity-specific elements Safety Management Programs are appropriately describes commensurate with their selection from the HA/AA?	☐	☐	☐	☐	☐	☐

Documented Safety Analysis Quality Metrics Sheet

DSA No. _____

	Sup	Sat	Needs Minor Impr	Needs Major Impr	Unsat	N/A
VI. General. [5%]						
A. Overall, the DSA is technically correct and of sufficient quality?	☐Y				☐N	
B. Referenced calculations, supporting, and companion documents are complete, approved, and consistent with the DSA?	☐Y				☐N	

Assigned numerical values for rating criteria:

5 pts. - Superior

4 pts. - Satisfactory

3 pts. - Needs Minor Improvement

2 pts. - Needs Major Improvement

1 pt. - Unsatisfactory

OVERALL QUALITY RATING: ____ (Sum of points for applicable attributes _____ ÷ _____total number of applicable attributes [41 possible attributes])

Reviewer's Name _____ Signature _____ Date _____

Technical Safety Requirements Quality Metrics Sheet Revision: _____

TSR Number: _____
Facility Name: _____
Facility Number: _____
AM Organization: _____
Reviewer's Name: _____

	Sup	Sat	Needs Minor Impr	Needs Major Impr	Unsat	N/A
I. Use and Application. [10%]						
A. Definitions are clearly and completely described and consistent with standard usage and with their intended use (including SAC definition provided in DOE-STD-1186-2004); also properly defines the ground rules for treating SACs?	☐	☐	☐	☐	☐	☐
B. Operating modes are clearly defined in terms of operational conditions, their use and application clearly provided, and generally consistent with established standards?	☐	☐	☐	☐	☐	☐
C. Provides the convention, meaning, and instructions for using Logical Connectors, Completion Times, and Frequency Notations consistent with established standards?	☐	☐	☐	☐	☐	☐
II. Safety Limits and Operating Limits. [19%]						
A. SL(s) are provided in TSR, Section 2.0, consistent with the HA/AA and any other SL established in the DSA or the Section clearly states that there is no SL required? When SL required, Section 2.0 precisely describes the parameter in measurable terms, specifies applicability, and required actions?	☐	☐	☐	☐	☐	☐
B. Clearly and completely describes the general applicability LCOs/LCSs and SRs (i.e., 3.0 and 4.0 Sections) appropriate for this TSR consistent with established standards?	☐	☐	☐	☐	☐	☐
C. Each LCO and LCS (including those for SACs) clearly and concisely describes the lowest functional capability or performance level of the selected control consistent with the HA/AA, Safety SSC Chapter, and Derivation of TSR Chapter of the DSA and the classification of the control?	☐	☐	☐	☐	☐	☐
D. The mode applicability and process area applicability are appropriately identified for each LCO/LCS?	☐	☐	☐	☐	☐	☐
E. Each Condition of the LCO/LCS Actions is consistent with the LCO/LCS?	☐	☐	☐	☐	☐	☐

Technical Safety Requirements Quality Metrics Sheet

TSR No. _____

	Sup	Sat	Minor Impr	Major Impr	Unsat	N/A
II. Safety Limits and Operating Limits (*continued*).						
F. The Required Actions are adequate and sufficient for each LCO/LCS Condition and the Completion Times are appropriate to allow implementation and ensure safety?	☐	☐	☐	☐	☐	☐
III. Surveillance Requirements. [10%]						
A. The SRs for each LCO/LCS explicitly describe the, verification test, calibration, inspection, etc. that ensure the LCO/LCS requirements are met including the acceptance criteria for each SR?	☐	☐	☐	☐	☐	☐
B. The frequency of performance of each SR is appropriately provided and the periodicity sufficient to ensure the LCO/LCS requirements are met?	☐	☐	☐	☐	☐	☐
C. The SRs and their frequencies of performance are consistent with the HA/AA, Safety SSCs Chapter, and Derivation of TSR Chapter of the DSA?	☐	☐	☐	☐	☐	☐
IV. Administrative Controls. [19%]						
A. DSA identified Administrative Controls, both programmatic and specific "Directive Action," are comprehensively addressed in the Administrative Controls Section of the TSR (Specific "Directive Actions" comprehensively identify the specific requirement/action consistent with DOE-STD-1184-2004)?	☐	☐	☐	☐	☐	☐
B. The Safety Management Programs committed to in the DSA are appropriately described in the Administrative Controls Section of the TSR?	☐	☐	☐	☐	☐	☐
C. The level and specificity of each Safety Management Program element is consistent with the credit taken in the HA/AA and with the justification of the level in the Derivation of TSR Chapter of the DSA?	☐	☐	☐	☐	☐	☐

Technical Safety Requirements Quality Metrics Sheet

TSR No. _____

	Sup	Sat	Needs Minor Impr	Needs Major Impr	Unsat	N/A
IV. Administrative Controls (*continued*).						
D. The Administrative Controls Section appropriately delineates the administrative functions that are required to be met including management responsibilities, especially designation of the person in authority allowed to approve emergency actions that depart from the TSR and minimum staffing; requirements for establishing, implementing, and maintaining required procedures and the process for their review and approval; requirements for reviews and audits; requirements for document control and recordkeeping; reporting requirements; operability principles; and arrangements and/or agreements between companies or entities to perform specific TSR functions or actions?	☐	☐	☐	☐	☐	☐
E. The Administrative Controls Section appropriately describes the general requirements for the TSR including the requirement that the TSR be complied with, except as stated; TSR changes are controlled and approved by DOE; circumstances that result in a violation of TSR; responses to TSR violations; and requirements for changes to the Bases?	☐	☐	☐	☐	☐	☐
F. The Administrative Controls, both programmatic, and specific "Directive Action," are consistent with the HA/AA, safety SSCs Chapter, and Derivation of TSR Chapter of the DSA? The bases for specific "Directive Actins" are clearly started consistent with the DSA?	☐	☐	☐	☐	☐	☐
V. Design Features. [13%]						
A. DSA identified passive safety SSCs are comprehensively addressed in the Design Features Section of the TSR?	☐	☐	☐	☐	☐	☐
B. Each TSR Design Feature clearly and completely describes the attribute(s) of the passive SSC that are taken credit for in the HA or AA?	☐	☐	☐	☐	☐	☐

Technical Safety Requirements Quality Metrics Sheet

TSR No. _____

	Sup	Sat	Needs Minor Impr	Needs Major Impr	Unsat	N/A
V. Design Features (*continued*).						
C. Each TSR Design Feature clearly and completely describes the configuration, physical arrangement including dimensions, and parameters being controlled, and any required maintenance and/or surveillance is appropriately delineated as a specific AC?	☐	☐	☐	☐	☐	☐
D. The Design Features are consistent with the HA/AA, Safety SSCs Chapter, and Derivation of TSR Chapter of the DSA?	☐	☐	☐	☐	☐	☐
VI. Bases. [19%]						
A. Background summary for each Bases clearly and concisely describes the safety function provided by the SL, LCS, or LCO and how it is credited in the HA/AA, concisely describes the SSC or SAC as it relates to the safety function, and describes the consequences of exceeding that limit?	☐	☐	☐	☐	☐	☐
B. Applicable safety analysis Section clearly and concisely describes the HA/AA included in the DSA from which the limit was derived including identification of the specific HA/AA scenario(s); relationship of the limit to the acceptance criteria used in the analysis; major input assumptions; accommodations for uncertainties, error allowance, and/or response time; and margin of safety?	☐	☐	☐	☐	☐	☐
C. Clearly and completely describes how each LCO/LCS is the lowest functional capability of the SSC or SAC needed to achieve the safety function credited in the HA/AA including describing each element of the limit (e.g., condition required, number of components required), how LCO/LCS was derived, implications of violating LCO/LCS?	☐	☐	☐	☐	☐	☐
D. Clearly and completely describes why the LCO/LCS is applicable in specified modes and process areas and why the LCO/LCS is not applicable in other modes and process areas including describing the relationships and conditions encompassed by HA/AA scenarios and any variations in requirements between modes/process areas?	☐	☐	☐	☐	☐	☐

Technical Safety Requirements Quality Metrics Sheet

TSR No. _____

	Sup	Sat	Needs Minor Impr	Needs Major Impr	Unsat	N/A
VI. Bases (*continued*).						
E. Clearly and completely describes the basis for each action including why the action allows operations to continue without the LCO/LCS condition being met, why the completion time is acceptable, explaining any mode changes and notes, how all the actions relate to each other, and source of specific values, times, and requirements?	☐	☐	☐	☐	☐	☐
F. Clearly and completely describes how each SR supports operability of the safety function and why the specified frequency is appropriate including showing the relationship of each SR to the LCO/LCS, basis for acceptance criteria for each SR, justification for each SR interval, and how the SR demonstrates compliance with industry code or stated reference if applicable?	☐	☐	☐	☐	☐	☐
VII. General. [10%]						
A. Hazard controls comprehensively flow from DSA to TSR and are addressed in the appropriate type of TSR provision (eg, SL, LCS, LCO, AC-programmatic and specific "Directive Action,", DF)?	☐	☐	☐	☐	☐	☐
B. TSR provisions are entirely based on the DSA including the HA and AA; SSC or SAC descriptions, classifications, functional requirements, and evaluations; and derivation of TSR (i.e., TSR provisions are not added without basis and description in the DSA)?	☐	☐	☐	☐	☐	☐
C. Overall, the TSR is technically correct, consistent with the DSA, and of sufficient quality?	☐Y				☐N	

Technical Safety Requirements Quality Metrics Sheet

TSR No. _____

Assigned numerical values for rating criteria:

5 pts. - Superior

4 pts. - Satisfactory

3 pts. - Needs Minor Improvement

2 pts. - Needs Major Improvement

1 pt. - Unsatisfactory

OVERALL QUALITY RATING: ____ (Sum of points for applicable attributes _____ ÷ _____total number of applicable attributes [31 possible attributes])

Reviewer's Name _____ Signature _____ Date _____

Generic
Documented Safety Analysis/
Technical Safety Requirements
Review Plan

U. S. Department of Energy
Oak Ridge Office

LIST OF ACRONYMS

CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
DSA	Documented Safety Analysis
LCO	Limiting Condition for Operation
LCS	Limiting Control Setting
ORO	Oak Ridge Office
SAC	Specific Administrative Control
SSC	Structures, Systems, and Components
SER	Safety Evaluation Report
TSR	Technical Safety Requirements

1.0 PURPOSE.

The Title 10 Code of Federal Regulations (CFR) 830, Subpart B, "Safety Basis Requirements," Paragraph 830.207 requires U.S. Department of Energy (DOE) approval of the safety basis for Hazard Category 1, 2, and 3 nuclear facilities. Paragraph 830.3 defines "safety basis" as the Documented Safety Analysis (DSA) and hazard controls that provide reasonable assurance that a DOE nuclear facility can be operated safely in a manner that adequately protects the workers, the public, and the environment. This generic DSA and Technical Safety Requirements (TSR) review plan (in conjunction with ORO O 420, Chapter XIII, Change 3, SAFETY BASIS DOCUMENTS REVIEW SYSTEM; and the associated implementing review procedure for the respective Oak Ridge Office [ORO] organization) establishes a formal process and outline guidance for ORO to conduct the DSA and TSR reviews. The review procedures for the individual ORO organization are as follows:

- AMESH-SB-01, Review of Safety Basis Documentation, for Environment, Safety, and Health;
- EM-7.3, Review of EM Safety Basis Documentation, for Environmental Management;
- AMNFS-2.2, Safety Basis Approval Process; and
- OSOP-240, Review and Approval of Nuclear Facility Authorization Basis Documents, for the Laboratories.

2.0 INTRODUCTION.

In accordance with the 10 CFR 830, Subpart B, contractors are required to prepare a DSA and TSR for each of their Category 1, 2, and 3 nuclear facilities or group of facilities. DOE evaluates the DSA and TSR by considering the extent to which the DSA and TSR adequately address the criteria set forth in 10 CFR 830, Subpart B, Sections 202, 204, and 205 and satisfy the provisions of the methodology used to prepare the DSA.

Section 204 of 10 CFR 830, Subpart B, states that Table 2 of Appendix A (DSA/TSR Review Plan Template) reflects acceptable "safe harbor" methodologies to prepare DSAs. Table 2 pairs facility types and activities with the appropriate DOE Directives or Standards and states that preparation of DSAs in accordance with these methodologies will facilitate review and approval. If a DSA is not prepared in compliance with the Safe Harbor Standards, the Cognizant Secretarial Office and Field Element Manager must approve and the DOE Headquarters Office of Environment, Safety, and Health must review and concur with the alternate methodology prior to completion of a compliance review. (Reference: DOE Manual 411.1-1C, SAFETY MANAGEMENT FUNCTIONS, RESPONSIBILITIES, AND AUTHORITIES MANUAL, Table 6 and 7). Note that if an alternate methodology is used, the contractor must obtain DOE's approval of the alternate methodology before the DSA is developed.

This generic DSA and TSR review plan provides a template and review checklists for developing a DSA/TSR-specific review plan. ORO's review of the DSA and TSR must be conducted in accordance with ORO O 420, Chapter XIII, Change 3, SAFETY BASIS DOCUMENTS REVIEW SYSTEM, and the associated implementing ORO organization review procedure(s). This can be accomplished by using a DSA/TSR-specific review plan developed using this document and, as necessary, adding additional technical review criteria and requirements based on the complexity the facility and/or the severity of the hazards. The respective ORO organization review procedure specifies the requirements for reviewer qualifications, team selection, roles and responsibilities, review plan preparation and approval, conduct of the review, review comment documentation and resolution, Safety Evaluation Report (SER) preparation and approval, and review records.

3.0 SCOPE AND OBJECTIVES.

The DSA/TSR-specific review plan defines the process of determining whether the DSA and TSR are compliant with the requirements prescribed by 10 CFR 830, Subpart B. The review plan also defines the extent and details of the review process, provides checks and balances for the Lead Reviewer and team members, and condenses the expectations for 10 CFR 830, Subpart B, and supporting standards into easy-to-use DSA and TSR review checklists. The completed review checklists can later be attached to the SER to support the basis for approving the DSA and TSR.

4.0 PROCESS AND METHODOLOGY.

As specified in ORO O 420, Chapter XIII, Change 3, and the associated implementing ORO organization review procedure, the Lead Reviewer prepares a review plan for new DSAs/TSRs, preliminary DSA submittals, or other significant safety basis reviews for which the complexity of the facility or the related issues warrant a review plan. Appendix A of this document provides the reviewers of all ORO organizations with a generic DSA and TSR review plan template that can be used to prepare a specific review plan and review criteria for use during the DSA and TSR review.

Appendices A, B, and C of this document can be used by the Lead Reviewer to prepare a review plan for the DSA and TSR. On the cover page, the Lead Reviewer should specify the DSA and TSR being reviewed, the titles and revision numbers of the DSA and TSR, and the date of the review plan. The signature page should provide spaces for the signatures of the Lead Reviewer as the preparer, concurrence by the safety basis technical lead or coordinator and project or program representative, and approval by the line Assistant Manager or designee. The body of the review plan should provide the following:

- Purpose
- Background and scope of the review
- List of the names of the review team members and subject matter experts
- Review team's organization, roles, responsibilities, and authorities
- How the review will be conducted
- Detailed schedule and milestones
- How comments will be documented and dispositioned
- Expectations for the SER

The review plan should not repeat the requirements of the associated implementing ORO organization review procedure. Therefore, the Lead Reviewer should reference the appropriate Sections of the ORO office procedure when developing the DSA/TSR-specific review plan. The important additions are any unique DSA/TSR issues or specifics and any DSA/TSR-specific technical review criteria and requirements.

The Lead Reviewer may use Appendices B and C of this document as part of the DSA/TSR-specific review plan. The Lead Reviewer and team members can use Appendices B and C as their review checklists for the DSA and TSR to verify compliance with the requirements prescribed by 10 CFR 830, Subpart B. The checklists focus the review and approval on the following approval bases:

- Base information
- Hazard and accident analyses
- Safety Structures, Systems, and Components (SSCs)
- Derivation of the TSR
- Safety management program characteristics

Appendices B and C provide the condensed expectations for DSAs and TSRs from 10 CFR 830 and the supporting standards. The checklists also provide the approval basis for each review criterion. When completing the checklists, the review team indicates for each question whether the criterion has been met and if not, provides the basis for the negative determination. The reviewers should also indicate whether or not there are open issues associated with the criterion, and for a negative determination, indicate how the criterion was dispositioned. Open issues are questions or compliance issues with the DSA or TSR identified by the reviewers relative to the criterion. Comments are provided back to the contractor to revise the DSA or TSR.

When the complexity of the facility or the severity of its hazards warrants additional technical review criteria or requirements, the review criteria or requirements must be appended to or incorporated into the DSA/TSR-specific review plan. It is expected that the technical review criteria and requirements will be similar in format to Appendices A, B, and C of this generic plan.

DSA/TSR Review Plan Template

Review Plan
for
(Title of DSA and TSR to be reviewed, their document numbers, and revision levels)

U. S. Department of Energy
Oak Ridge Office

Revision X

(Date)

SIGNATURE PAGE

Prepared By:

_____ _____
(Name) Date
Lead Reviewer

Concurrence:

_____ _____
(Name) Date
Safety Basis Technical Lead/Coordinator

_____ _____
(Name) Date
Project/Program Representative

Approval:

_____ _____
(Name) Date
(Title) Line Assistant Manager

Table of Contents (if required, based on the length and complexity of the review plan)

Introduction and Objectives

The introduction and objectives Sections should provide the purpose, background, and scope of the review. The purpose Subsection should identify why the review is being performed, for whom the review is being performed (mission element and approval authority), and a general identification of the information contained in the review plan.

The background Subsection should describe the facility and operations being reviewed to the extent necessary for a reader at a later date to understand the scope of the review and the composition of the team members. This should include the hazard category of the nuclear facility and/or its activities. Any special conditions affecting the review should be discussed. General expectations for the document being reviewed should be included (such as the type of document, the methodology for its development, and any special considerations affecting the document content or format), as well as the safe harbor used and the basis for it being chosen.

The scope Subsection should define the scope of the technical review by identifying the level of detail and technical areas/disciplines encompassed by the safety documentation and the regulatory requirements being addressed by the review. If the review will accomplish multiple objectives (such as ensuring compliance, judging the technical accuracy, and resolving pre-existing safety issues), the plan should list all of them. Any limitations on the review should be clearly defined and explained. Any technical, mission, or project-related influences affecting the extent of the review should be included.

List of Review Team Members and Subject Matter Experts and Responsibilities and Authorities

Provide a list of the names of the review team members and subject matter experts that will provide technical assistance to the review. By the name of each subject matter expert, specify the technical area to be reviewed.

Provide the review team organization, responsibilities, and authorities.

Note: If assigned by the approval authority, the Lead Reviewer will act as the single point of contact between the Oak Ridge Office (ORO) and the facility contractor for all matters regarding the review of the Documented Safety Analysis (DSA) and Technical Safety Requirements (TSR) and the review team. Any permitted interaction between the review team and the facility contractor should be identified in the review plan.

Review Process and Methodology

This Section should explain how the review will be managed and how the review efforts will be coordinated in accordance with the associated implementing ORO organization review procedure. This Section should also provide a detailed schedule for the review, including key interim milestones, comment resolution, SER development, and dates for facility walkthroughs and meetings. The Lead Reviewer should ensure that the general project schedule has sufficient time to conduct a quality review and that team members are available on a dedicated basis to support the review.

The DSA and TSR review checklists that the review team will use should be provided in the review plan. Appendices B and C may be used as these review checklists.

Examples of comment format and content requirements and methods for comment control and management are provided in the appropriate ORO organization review procedure (e.g., AMESH-SB-01, Section 4 and Attachment 3).

Note: Safety-significant comments should be justified so as to explain their impact on the safety basis if left unresolved. The Lead Reviewer will ensure the proper documentation and resolution of review comments and arbitrate issue resolution. The safety basis technical lead or coordinator will forward the results of the findings and conclusions from the review effort to the line management organization responsible for oversight of the contractor's preparation of the DSA and TSR.

Expectations for SER Format and Content

Suggested format and content requirements for SERs are provided in the appropriate ORO office review procedure (e.g., AMESH-SB-01, Section 5.5).

DOCUMENTED SAFETY ANALYSIS REVIEW CHECKLIST

Site Characteristics[1]			
Question	**Yes**	**No**	**Comments**
1. Does the description clearly identify the location of the site, the location of the facility within the site, its proximity to the public and to other facilities, and identification of the point where the evaluation guideline is applied (i.e., the location of the maximally exposed off-site individual)?			
2. Does the description clearly identify population sheltering, population location and density, and other aspects of the surrounding area to the site that relate to assessment of the protection of the health and safety of the public?			
3. Does the description provide the historical basis for site characteristics in meteorology, hydrology, geology, seismology, volcanology, and other natural phenomena to the extent needed for hazard and accident analyses?			
4. Have design basis or evaluation basis natural phenomena criteria been identified based on proven and accepted methods?			
5. Have sources of external accidents (e.g., nearby airports, railroads, or utilities such as natural gas lines) been clearly identified?			
6. Have nearby facilities impacting or impacted by the facility under evaluation been identified?			
7. Have the site characteristic assumptions common to the safety analysis that were used in prior environmental analyses and impact statements (if available) or the need to revise and update such assumptions used in facility environmental impact statements been identified or revised?			

[1] To the extent that potential accident consequences are limited to the facility itself or its immediate vicinity (e.g., some Hazard Category 3 facilities), the "graded approach" allows for the emphasis of this discussion to be on the on-site characteristics.

DOCUMENTED SAFETY ANALYSIS REVIEW CHECKLIST

Facility Description[2]			
Question	**Yes**	**No**	**Comments**
1. Does the facility overview include a clear discussion of the facility's inputs, outputs, mission, scope of operations, life cycle stage, and history, including projected future uses if different?			
2. Is a description of the facility's structure and design basis or evaluation basis provided, including construction details, materials, dimensions, and layouts to the extent sufficient to support the hazards and accident analyses?			
3. Is a description of the facility's process systems and constituent components, instrumentation, controls, operating parameters, and relationships of the SSCs provided, along with a summary of the types and quantities of hazardous materials?			
4. Is a description of the facility's confinement systems provided?			
5. Is a description of the facility's safety support systems provided, including the purpose and a general overview of each system?			
6. Is a description of the facility's utilities provided?			
7. Is a description of the facility's auxiliary systems and support facilities provided?			

[2] Based on the significance of preventative and mitigative features (e.g., fewer features may be important for some Hazard Category 3 and even Hazard Category 2 facilities), the level of complexity in this discussion can vary as a means of implementing the "graded approach."

DOCUMENTED SAFETY ANALYSIS REVIEW CHECKLIST

Hazard Identification			
Question	**Yes**	**No**	**Comments**
1. Is the hazard identification methodology presented with regard to how the hazardous materials and energy sources were identified and inventoried, including the use of referenced information, if applicable?			
2. Is a summary table provided that systematically identifies the hazards by type, quantity, form, and location, including a brief summary of the major accidents or hazardous situations that have actually occurred at the facility? [Note: If classification issues preclude such specification in the main document, a classified Appendix must be provided.]			
3. Do the hazards and quantities identified cover all operations described in Chapter 2, *Facility Description*, including all modes of operation (startup, normal operation, shutdown, abnormal testing, or maintenance configurations, etc.)?			
4. Are the hazards and quantities identified consistent with the statements and assumptions made in the hazard and accident analysis detailed throughout Chapter 3?			
5. Are the hazards and quantities identified consistent with the statements and assumptions made in the Fire Hazard Analysis for the facility?			
6. Are the hazards and quantities identified consistent with the statements and assumptions made in the Emergency Management Hazard Analysis for the facility? [Note: A “No” answer does not necessarily mean the DSA is inadequate.]			
7. Are the quantities specified derived from credible bases (e.g., flowsheets, historical data, and operational limits) in a reasonably conservative manner?			
8. Are the initial and final hazard categories assigned for the hazards identified consistent with the methodology of DOE-STD-1027-92, including segmentation, if employed?			

DOCUMENTED SAFETY ANALYSIS REVIEW CHECKLIST

Hazard Evaluation (Hazard Analysis)[3]			
Question	**Yes**	**No**	**Comments**
1. Is the hazard evaluation methodology (a) stated explicitly, (b) consistent with the safe harbor analysis methods chosen for this DSA, and (c) reasonably tailored to the type and complexity of the operations examined?			
2. Were facility operating personnel involved in the evaluation?			
3. Was available information used for the analysis (e.g., procedures, process and equipment descriptions, flowcharts) consistent with that reasonably available from the facility?			
4. Where holes existed in the available information, was supporting information generated (e.g., summary descriptions, drawings, and flowcharts) sufficient to provide a basic understanding of the significant operations, key parameters, and controls?			
5. Is a complete set of hazard evaluation worksheets/tables available to inspect? [Note: Completeness requires the following columns for each entry: a specific hazard, the accident type and cause, all associated preventive and mitigative controls, consequence and likelihood ranking estimates, and a field for comments or recommended action items.]			
6. Do the cumulative hazard evaluation worksheets address every hazard identified in the hazard identification summary table as well as each operation/activity described in the Facility Description Section of the DSA? Are initiating events also identified?			
7. Does the Fire Hazard Analysis appropriately flow forward into the DSA hazard analysis?			

[3] Consistent with the graded approach, the thoroughness of the hazard evaluation documentation should be commensurate with the facility's hazard categorization and take into account both the magnitude of the hazards and the facility's complexity. For example, the hazard analysis may only need to be sufficient to support a simple estimate of bounding consequences for Hazard Category 3 facilities.

DOCUMENTED SAFETY ANALYSIS REVIEW CHECKLIST

Hazard Evaluation (Hazard Analysis)[3]			
Question	**Yes**	**No**	**Comments**
8. Do all of the required worksheet entry columns appear to have been treated appropriately (i.e., there are no vague hazards or causes, no generic or incomplete control listings, and no comments or recommended action items)?			
9. Are the bases for consequence and likelihood binning qualitatively defined?			
10. Is the scenario binning technique applied consistently throughout the evaluation? Are consequences qualitatively assessed with and without the controls? [Note: The binning must clearly distinguish the largest consequence events to identify unique and representative scenarios for accident selection. Dismissal of physically plausible, internally initiated events due to risk or mitigated consequence criteria is inappropriate.]			
11. Are all of the significant aspects of the facility's operations known to the reviewer(s) and/or noted in the facility walkdowns covered by the hazard evaluation?			
12. Are the hazard analysis assumptions clearly presented and justified?			

[3] Consistent with the graded approach, the thoroughness of the hazard evaluation documentation should be commensurate with the facility's hazard categorization and take into account both the magnitude of the hazards and the facility's complexity. For example, the hazard analysis may only need to be sufficient to support a simple estimate of bounding consequences for Hazard Category 3 facilities.

DOCUMENTED SAFETY ANALYSIS REVIEW CHECKLIST

Hazard Analysis Results[4]			
Question	**Yes**	**No**	**Comments**
Planned Design and Operational Safety Improvements			
1. Is there evidence, documented in the DSA or separately, that the hazard analysis-generated action items and recommendations were assessed by facility and operations management?			
2. Where issues require further study, a significant concern cannot be fully addressed at present, or major upgrades are planned, have appropriate interim operational control commitments been made?			
Defense in Depth/Worker Safety			
3. Is the information captured in the hazard analysis adequately summarized and presented in an organized manner (from hazard source to outer layers of defense) such that it identifies those design and administrative features most important to achieving the overall safety principles (defense in depth) and the major principles of worker protection (worker safety) for a given facility or operation?			
4. Is the identification of major controls in the defense-in-depth and worker safety discussions consistent with those identified in the hazard evaluation worksheets?			
5. Does the DSA demonstrate a coherent thought process leading to the selection of safety-significant SSCs and Specific Administrative Control (SACs) and TSR commitments, and does that process focus on determining (a) the defense-in-depth items most important to avoiding uncontrolled releases of hazardous material, (b) those features most critical to avoiding worker fatalities or serious injuries or significant radiological or chemical exposures to workers, and (c) the associated TSRs most appropriate to ensure that these items and features are not seriously challenged and/or will likely maintain their functionality?			

[4] Consistent with the graded approach, the hazard analysis results in terms of the number and complexity of the features relevant to defense in depth and worker safety should be commensurate with the facility's hazard categorization and take into account the magnitude of the hazards and the facility's complexity. In addition and in particular, accident selection and subsequent accident analyses are generally not required for Hazard Category 3 facilities unless there is a serious potential for exceeding the evaluation guidelines for a chemical release. For such facilities, usually only a summary is provided of the maximum consequences expected from an accident and a statement that these are well below the evaluation guidelines.

DOCUMENTED SAFETY ANALYSIS REVIEW CHECKLIST

Hazard Analysis Results[4]			
Question	**Yes**	**No**	**Comments**
6. Based on the defense-in-depth and worker safety information presented in the DSA, is the set of safety-significant SSC and SAC designations and associated TSR commitments considered to be adequate?			
Environmental Protection			
7. Are all of the pathways identified for uncontrolled release of large amounts of hazardous materials to the environment?			
8. Do the defense-in-depth measures identified provide reasonable and prudent prevention and mitigation for the potential environmental releases?			
Accident Selection			
9. Is the accident selection consistent with the hazard evaluation, its definitions of defense in depth and worker safety, and the associated scenario binning?			
10. Is the selection of internally initiated accidents for the accident analysis based on consequence? [Note: Dismissing such events based on low frequency or risk arguments related to the controls is inappropriate.]			
11. Is the selection of natural phenomena and externally initiated events in accordance with DOE Standards? [Note: Initiator frequency is used to define these events.]			
12. Does the selection of accidents for the accident analysis appropriately consider the Fire Hazard Analysis?			
13. Do the accidents selected cover all of the controls associated with the unique and representative accidents that could challenge the evaluation guideline for the maximally exposed off-site individual? [Note: Refer to DOE-STD-3009, Appendix A.]			

[4] Consistent with the graded approach, the hazard analysis results in terms of the number and complexity of the features relevant to defense in depth and worker safety should be commensurate with the facility's hazard categorization and take into account the magnitude of the hazards and the facility's complexity. In addition and in particular, accident selection and subsequent accident analyses are generally not required for Hazard Category 3 facilities unless there is a serious potential for exceeding the evaluation guidelines for a chemical release. For such facilities, usually only a summary is provided of the maximum consequences expected from an accident and a statement that these are well below the evaluation guidelines.

DOCUMENTED SAFETY ANALYSIS REVIEW CHECKLIST

Accident Analysis			
Question	**Yes**	**No**	**Comments**
Analysis Methods			
1. In each accident scenario, is a basis explicitly identified for all major parameter values (e.g., values for the five-factor formula defined in DOE-HDBK-3010-94)?			
2. Is a basis explicitly identified for all major meteorological dispersion parameters?			
3. Are the general principles or references used for accident modeling, including any computer codes used, identified with sufficient amplifying information to clarify the bases for input and calculation?			
Scenario Development			
4. Is each scenario described in a clear, linear sequence (i.e., detailed, step-by-step explanatory text linked to any fault/event trees used)?			
5. Are the functions of preventive and mitigative features associated with each scenario clearly explained?			
6. Is documentation needed to support the scenario description (e.g., seismic damage) presented either in detail or as a summary of a cited reference?			
7. Is each complete scenario consistent with the hazard analysis and the rest of the DSA, and does it accurately reflect the findings of the separate studies referenced?			
Calculations			
8. Are the parameters used for calculation (a) supported by technical references and/or reasonable experience from relevant and reliable sources and (b) credible in the context of each overall scenario?			
9. Considered as a sum total, do the parameters used give confidence of a reasonably conservative answer?			
10. Is each final source term clearly specified?			
11. For each scenario, are unmitigated (or uncontrolled) consequences clearly identified and directly compared with the evaluation guideline to determine if the need for a safety-class SSC or SAC designation exists?			

DOCUMENTED SAFETY ANALYSIS REVIEW CHECKLIST

Accident Analysis			
Question	**Yes**	**No**	**Comments**
Safety Class Assessment			
12. Does each scenario whose unmitigated (or uncontrolled) consequences challenge the evaluation guideline document a coherent thought process for the selection of safety-class SSCs and SACs from a candidate pool, as well as any additional TSR commitments?			
13. Does review of the basis for safety-class designation indicate that all appropriate designations and associated TSR commitments have been made?			
Beyond Design Basis Accidents			
14. Has consideration been given to the need for an analysis of accidents beyond the design basis of the facility (see §830.204 and DOE-STD-3009-94, Section 3.4.3) for outside the DSA cost-benefit considerations if the consequences challenging the evaluation guideline are identified in the beyond design basis accident range? Are any such analyses sufficient to provide a perspective on potential facility vulnerabilities?			
Accident Analysis Assumptions			
15. Are the accident analysis assumptions clearly presented and justified?			
Results			
16. Are the DSA accident analyses results (identification of the required hazard controls, such as the safety-class SSCs and SACs) consistent with the Fire Hazard Analysis and Emergency Management Hazard Analysis conclusions?			

DOCUMENTED SAFETY ANALYSIS REVIEW CHECKLIST

Safety SSCs[5]			
Question	**Yes**	**No**	**Comments**
1. Does the DSA (preferably in a summary table) clearly provide (a) identification of the safety-class, safety-significant, and important-to-safety[6] SSCs and SACs, (b) bases for identifying these SSCs and SACs (i.e., the accident for which they are needed), (c) their safety functions, (d) their functional requirements, (e) their performance requirements (including, as appropriate, system and SACs descriptions, drawings, specifications, surveillances, maintenance, specific operational response and capabilities necessary to meet SAC functional requirements, and requisite operator training and qualifications associated with the vital safety systems or actions), and (f) provisions for requiring TSR coverage for safety-class and safety-significant SSCs and SACs?			
2. For each safety-class and safety-significant SSC or SAC identified, is a clear and concise description of the safety function provided, including identification of the specific accidents that the safety SSC or SAC impacts?			
3. For each safety-class and safety-significant SSC or SAC identified, is a detailed description provided that specifies the basic principles by which it performs its safety function?			
4. For each safety-class and safety-significant SSC or SAC identified, is a description provided of its boundaries and interface points with any other SSCs relevant to its safety function?			
5. For each safety-class and safety-significant SSC or SAC identified, is a clear discussion provided of the failure modes and the actions needed to prevent failure or for human performance factors (including consequences of incorrect implementation of the SAC and measures to prevent control failure)?			

[5] Application of the graded approach should result in Hazard Category 3 facilities typically not identifying any safety-class SSCs, and the number of safety-significant SSCs will generally be fewer than those of high category facilities (serious chemical hazards may provide exceptions to these expectations). In addition, it is expected that the safety-class SSCs will require more formality in establishing both functional requirements and related performance criteria than the safety-significant SSCs.

[6] DOE G 421.1-2, *Implementation Guide For Use In Developing Documented Safety Analyses To Meet Subpart B Of 10 CFR 830*, states that other SSCs important to safety are items that perform a safety function but do not rise to the level of importance of safety-class and safety-significant SSCs. Important-to-safety SSCs are sometimes known as defense-in-depth items.

DOCUMENTED SAFETY ANALYSIS REVIEW CHECKLIST

Safety SSCs[5]			
Question	**Yes**	**No**	**Comments**
6. For each safety-class and safety-significant SSC or SAC identified, are the functional requirements clearly and concisely provided (i.e., limited to those requirements necessary for the safety function)?			
7. For each safety-class and safety-significant SSC or SAC identified, do the functional requirements specifically address the pertinent response parameters or nonambient environmental stresses related to each specific accident for which the SSC has a safety function or specific operational responses and capabilities?			
8. For each safety-class and safety-significant SSC or SAC identified, are the performance requirements clearly based on the accident parameters and concisely articulated?			
9. For those cases where the design basis of the safety SSC or SAC is not known, has a comparison been performed against traditional design criteria (e.g., single failure) or, for SAC, has an evaluation been performed to verify and validate the responses and capabilities required?			
10. For each safety-class and safety-significant SSC or SAC identified, have the potential TSRs needed to ensure the safety function of the SSC or SAC been identified?			
11. Have support SSCs (including auxiliaries, utilities, instrumentation, and control systems) on which important-to-safety, safety-significant, and safety-class SSCs and SACs rely to perform their safety functions been identified and designated as important-to-safety, safety-significant, and safety-class SSCs, respectively (i.e., the support SSCs are designated at the same level as the supported SSCs and SACs)?			

[5] Application of the graded approach should result in Hazard Category 3 facilities typically not identifying any safety-class SSCs, and the number of safety-significant SSCs will generally be fewer than those of high category facilities (serious chemical hazards may provide exceptions to these expectations). In addition, it is expected that the safety-class SSCs will require more formality in establishing both functional requirements and related performance criteria than the safety-significant SSCs.

DOCUMENTED SAFETY ANALYSIS REVIEW CHECKLIST

Derivation of TSRs			
Question	**Yes**	**No**	**Comments**
1. Is the hazard categorization of the facility defined? Is the content of the discussion on derivation of the TSRs commensurate with the hazard categorization?			
2. Are the codes, standards, regulation, and DOE Directives listed specifically relevant to establishing the TSR controls and the contractor's commitment?			
3. Is the hazard analysis organized in such a way that it can be judged to be comprehensive, and is the hazard analysis adequate as a basis for TSR development?			
4. Is the hazard analysis tool used adequate with respect to the complexity of the process, the activities in the facility, and the facility's history (e.g., new versus existing)?			
5. Does the hazard analysis identify consequences, likelihood, and mitigators/ preventers for determination of the TSR controls?			
6. Are all of the items in the hazard analyses with respect to public protection, worker protection, and defense in depth covered by the TSR controls?			
7. Are safety features identified that are not covered by the TSR controls?			
8. Do the facility modes reflect the actual cycles of operations/ activities conducted in the facility? [Note: If any facility modes are derived from accident scenarios, this derivation should be presented.]			
9. Are facility modes established in such a way that the status of safety systems and SACs can be distinctively defined?			
10. Are staffing level requirements or other administrative limits considered in the facility modes?			

DOCUMENTED SAFETY ANALYSIS REVIEW CHECKLIST

Derivation of TSRs			
Question	**Yes**	**No**	**Comments**
11. If the facility contains several structural segments or multiple activities, are facility modes established to accommodate this situation?			
12. The TSR controls are generally derived from preventive or mitigative features identified in the hazard analysis. Is this derivation clearly shown?			
13. Are the criteria provided for selecting the Safety Limits, Limiting Control Settings (LCSs), and Limiting Conditions for Operation (LCOs)? Is the evaluation guide from DOE-STD-3009, used? If so, is it described?			
14. Are the controls that support front-line safety systems and SACs identified and included as needed?			
15. Are the assumptions or parameters used in the hazard analysis or the accident analysis identified and included, as needed, for establishing the surveillance requirements and operability?			
16. Are vendors' specifications identified and included, as needed, for establishing the surveillance requirements?			
17. Does the Administrative Controls Section include all of the administrative controls identified in the hazard analysis that are not addressed by SAC LCOs? Are the specific "Directive Actions" clearly delineated?			
18. Are the administrative controls covering the safety management program tailored for any facility- or activity-specific situations?			
19. Does the Design Features Section identify passive design features and provide the rationale for their selection?			
20. Are all controls from other facilities and activities whose operations can impact this facility identified?			

TECHNICAL SAFETY REQUIREMENTS REVIEW CHECKLIST

TSRs – Sections 1 and 2			
Question	**Yes**	**No**	**Comments**
1. Does Section 1 include a list defining the terms used in the TSR document that require clarification of the intent of their use? Does it include the definition of SAC from DOE-STD-1186-2004?			
2. Are the definitions clear, and are they consistent with standard usage and with the intended use of the terms?			
3. Does Section 1 clearly define the operating modes of the facility in terms of operational conditions? Is there an adequate explanation of the use and application of the operating modes?			
4. Are the operating modes generally consistent with the standard modes established in DOE G 423.1-1? If not, is the variation justified due to the unique features of the facility or operations?			
5. Does Section 1 include the standard use and application explanations for the following TSR devices: - Logical Connectors - Completion Tim - Frequency Notation - Safety Limits - LCSs - LCOs - Surveillance Requirements [Note: Standard use and application explanations are specified in DOE G 423.1-1 and the Defense Programs *Document of Example Technical Safety Requirements, Volume I, Examples*, November 1993. Explanations may include minor variations to account for unique facility conditions.]			
6. Are the Safety Limits included in Section 2 consistent with the hazard and accident analyses and any inferred Safety Limits established in the DSA? If no Safety Limits are required, does Section 2 so state?			

TECHNICAL SAFETY REQUIREMENTS REVIEW CHECKLIST

TSRs – Sections 1 and 2			
Question	**Yes**	**No**	**Comments**
7. Do the Safety Limits describe (as precisely as possible) the parameters being limited, state each limit in measurable terms, and indicate the applicability of each limit?			
8. Are the actions required to be taken if a Safety Limit is exceeded described, and do they maintain or otherwise achieve a safe, stable state?			
9. Is it stated that the contractor must obtain DOE's authorization to restart the facility following the violation of a Safety Limit?			

TECHNICAL SAFETY REQUIREMENTS REVIEW CHECKLIST

TSRs – Section 3, LCOs/LCSs			
Question	**Yes**	**No**	**Comments**
1. Do the LCOs/LCSs identified in the TSR agree with those identified in Chapters 3 and 5 of the DSA?			
2. Are the operability requirements for each of the SSCs or the specific limits or operator actions for each SACs covered by the LCOs/LCSs clearly identified? Are they unambiguous and concise, so as to not lead to misinterpretation? [Note: LCOs/LCSs that simply state that the SSC has to be operable are not acceptable.]			
3. Is the mode applicability adequate for each of the LCOs/LCSs?			
4. Is the facility or activity applicability adequate for each of the LCOs/LCSs?			
5. Do the LCO/LCS conditions agree with each of the LCO/LCS requirements?			
6. Are the remedial actions adequate for the conditions; that is, do they become more conservative (safer condition) as they are implemented?			
7. Does each of the remedial actions have a completion time, and are the times adequate to allow implementation and ensure safety?			
8. Are there bases for each of the LCOs/LCSs, the mode applicability, the remedial actions, and their completion times?			
9. Are these bases adequate to support the LCOs/LCSs? [Note: They should not be a regurgitation of the LCOs/LCSs themselves.]			

TECHNICAL SAFETY REQUIREMENTS REVIEW CHECKLIST

TSRs – Section 4, Surveillances			
Question	**Yes**	**No**	**Comments**
1. Is there at least a one-to-one correspondence between the LCO/LCS requirements and the surveillance requirements? That is, there should be at least one surveillance requirement per LCO/LCS requirement.			
2. Are the surveillance requirements explicit enough to ensure that the LCO/LCS requirements are met?			
3. Does each of the surveillance requirements have a frequency of performance?			
4. Is each of the frequencies adequate to ensure the operability of the safety SSC or the specific limit or operator action of the safety SAC covered by the LCO/LCS?			
5. Do the bases provide enough information to support the surveillance requirements and their frequencies?			

TECHNICAL SAFETY REQUIREMENTS REVIEW CHECKLIST

TSRs – Section 5, Administrative Controls			
Question	**Yes**	**No**	**Comment**
1. Are specific "Directive Actions" and their bases clearly delineated and consistent with their selections as SACs in Chapters 3, 4, and 5 of the DSA?			
2. Is there a commitment to a conduct of operations program driven from the hazards and accident analyses, as appropriate?			
3. Is there a commitment to the appropriate quality assurance program?			
4. Are minimum staffing requirements addressed? Are staffing requirements by mode or operation addressed? [Note: This should be covered if the analysis relies on staffing as a safety factor.]			
5. Is there a specific commitment to personnel qualification and training? Does this commitment identify the program or requirement that will govern qualification and training? Is the commitment consistent with information found in the DSA, particularly Chapters 12 and 14?			
6. Is there a commitment to a program for conducting in-service inspection and testing, and is it consistent with the commitments in Chapter 10?			
7. Is there a commitment to configuration control? If the configuration control program is approved by DOE, it may be included by reference (see Chapter 17 for supporting commitments). If the program is not approved by DOE, then the process must be described and committed to and include references to the applicable standards. DSA Chapter 17 describes the configuration control program and should reference the contractor's procedures and standards. Basic elements should be described. [Note: Configuration control for nonfacility, nuclear operations must be considered on a case-by-case basis.]			
8. If criticality safety is applicable, is there a commitment to criticality safety, including the physical and administrative controls essential for the program? Is the criticality safety program briefly described? Is the description consistent with Chapter 6 of the DSA?			

TECHNICAL SAFETY REQUIREMENTS REVIEW CHECKLIST

TSRs – Section 5, Administrative Controls			
Question	**Yes**	**No**	**Comment**
9. Are material inventory controls addressed in the Administrative Controls Section? [Note: In some cases, an LCO might cover some aspects of this control.] Does this Section identify all of the materials which require control to satisfy basic accident assumptions, categorization limits, regulatory limits, etc., that are necessary to remain within the hazard category (typically fissile, radioactive, toxic, explosive, etc.)? Do the material controls identify where the limits apply (total facility, wing, operation, etc.)? Do the material limits address how the limits will be controlled? Are these material limits appropriately addressed in accordance with DOE-STD-1186-2004?			
10. Is fire protection appropriately addressed? Fire protection elements that are important to the identified accident control should be included in an administrative control and may require designation as an SAC (either LCO or specific "Directive Action") per DOE-STD-1186-2004. Fire detection and suppression equipment may be included in the administrative control as an element of the overall fire protection program. LCOs/LCSs may also exist for selected elements of the fire protection system. Many facilities may rely upon a combustible loading program. If the combustible loading program is credited as important in the accident or hazard analyses, then an SAC should be included either as an LCO within the LCO/LCS Section of the TSR or a specific "Directive Action" within the Administrative Control Section of the TSR. The combustible loading program should address loading limits (transitory and fixed), as well as the method used to maintain the limits. Commitment to the appropriate National Fire Protection Association standards adopted by the contractor should be noted if they are critical to the safety function of the fire protection program, and they should be consistent with the discussions in the DSA.			

TECHNICAL SAFETY REQUIREMENTS REVIEW CHECKLIST

TSRs – Section 5, Administrative Controls			
Question	**Yes**	**No**	**Comment**
11. If the requirements of 29 CFR 1910.119 are applicable, does the TSR Administrative Controls Section contain a commitment to process safety management? The administrative control should identify how the requirements are met and reference the program established to satisfy the requirements.			
12. Are radiological effluent control and ventilation filter testing addressed? These may be addressed through administrative controls if they are necessary for worker protection or are used to limit radiological material releases. If they are included, then the applicable programs, facility areas, mechanical systems, testing programs, sampling, monitoring systems, and standards should be identified or referenced.			
13. Is radiological protection addressed? Radiological protection should be included if this program is credited as a significant protection element for the nuclear facility. Provide a list of the major elements associated with the program, such as sampling, dosimeter, training, personal protective equipment, control areas and zones, etc. Reference the applicable contractor and facility programs.			
14. Is emergency planning addressed? Emergency planning should be included in the administrative controls. Is there a specific commitment to an emergency plan, and is this commitment consistent with the emergency planning programmatic discussion in the DSA?			
15. Are explosive gas and toxic substances monitoring programs addressed? If these programs are relied on in the hazard or accident analyses, the programs should be committed to and referenced in the Administrative Controls Section and may require either an LCO or specific "Directive Action." The discussion in the TSR should be consistent with the discussion of the same topics in the programmatic discussions in the DSA.			

TECHNICAL SAFETY REQUIREMENTS REVIEW CHECKLIST

TSRs – Section 5, Administrative Controls			
Question	**Yes**	**No**	**Comment**
16. Are facility radiation monitoring and storage tank radiation monitoring addressed? If these elements are important to the safe operation of the facility (based on the hazards or accident analyses), then an administrative control committing to these programs should be included and may require either an LCO or specific "Directive Action." The specific "Directive Action" may be included in the radiation protection program. The administrative control should include the physical facility areas involved, the radioactive substances monitored, the monitoring equipment and its locations, the applicable standards, and any associated limits. These discussions should be consistent with the description of radiation protection provided in the DSA.			
17. Are environmental measurements and control aspects addressed? If environmental measurement and control are relied on to protect the workers or the environment, then an administrative control committing to the program or processes should be included in the TSR. If it is included, a brief description of the program, related equipment, monitored substances, and controls should be provided. The corresponding programmatic and facility descriptions in the DSA should be consistent.			
18. Are the safety programs committed to in the DSA and relied on for worker or public safety in the hazard and accident analyses, that are not already addressed as LCOs, addressed in the Administrative Control Section, as specific "Directive Action"? Descriptions of programs, equipment, and controls should be consistent with the DSA.			

TECHNICAL SAFETY REQUIREMENTS REVIEW CHECKLIST

TSRs – Section 5, Administrative Controls			
Question	**Yes**	**No**	**Comment**
19. Are the facility's procedures addressed? The system that governs the production, review, control, use, and revision of procedures (particularly those procedures required to implement the TSR) should be in the Administrative Control Section as described in DOE G 423.1-1, Section 5.2.4. Does this description include how the TSR is included in the procedures? Are specific procedure types identified that are managed under this control? Do these types encompass all of the TSR commitments that would require a procedure? Are other documents referenced that detail how these commitments are met? Are the discussions consistent with the corresponding discussions in the DSA?			
20. Is there a commitment to the unreviewed safety question program as required by 10 CFR 830, Subpart B? Is the program summarized, including the basic elements?			
21. Is the contractor's organization and management structure addressed? Does the description focus on line authority, responsibility, and communications for the facility, ranging from the operator on the floor to the person ultimately responsible for the facility and its operations? Are lines of authority, responsibility, and communication for critical support functions, if any, identified? These should include fire protection, maintenance, emergency response, security, etc. If independent review groups oversee or audit the facility's operations, identify them, their organization, and the reporting chain. The contractor's program documents should be referenced, as necessary.			
22. Is the safety review and audit process addressed? Does the discussion address the review of all safety items? Are those items that require review identified? Do these items include proposed changes to the TSRs and procedures, operational occurrences and Occurrence Reports, unreviewed safety questions, and quality control concerns?			

TECHNICAL SAFETY REQUIREMENTS REVIEW CHECKLIST

TSRs – Section 5, Administrative Controls			
Question	**Yes**	**No**	**Comment**
23. Is there a commitment to and a description of or reference to the facility's document control system? Does this control system support the facility's operations to the most current of important documents, such as the TSR, DSA, operating procedures, facility drawings, manuals, program descriptions, and other similar documents?			
24. Are reporting requirements for TSR deviations included in the administrative controls? A commitment to report deviations in accordance with the Occurrence Reporting System should be included.			
25. Is there a description of the process for revising the TSRs? Does this description include required contractor reviews and approvals? This description may be included in another Section of the administrative controls dealing with facility and organization and management.			
26. Is recordkeeping addressed? This Section should describe the recordkeeping program, or if there is no formal program, then define how the function is accomplished. Does the discussion include the types of records that are kept, storage requirements, retention times, and retrieveability requirements?			
27. Unless the TSR consists of only administrative controls, is the OPERABILITY definition and implementing principles described? This topic may be included in the Use and Application Section instead of the Administrative Controls Section.			
28. Is there a description and commitment to the program to control the TSR bases? Does this Section describe how the program works, the management functions for making decisions on bases changes, and the review process? This may be addressed elsewhere in the TSR, such as under document control.			

TECHNICAL SAFETY REQUIREMENTS REVIEW CHECKLIST

TSRs – Appendix A, Bases			
Question	**Yes**	**No**	**Comments**
1. Are all of the technical bases presented in a clear, logical, and concise manner that follows the format of the Appendix to DOE G 423.1-1?			
2. Are all of the technical bases presented in a clear, logical, and concise manner that facilitates the evaluation of unreviewed safety questions which may arise from investigating changes to operating parameters of safety controls or potential changes to the margin of safety?			
3. For each TSR specified (e.g., Safety Limit, LCO, LCS, specific "Directive Action"), are the technical bases directly based on specific Sections (including references) of the hazard or accident analyses contained within the DSA?			
4. For each TSR specified (e.g., Safety Limit, LCO, LCS, specific "Directive Action"), that impacts the operation of a safety SSC or SAC, are the technical bases directly based on safety function and system or SAC evaluations (including references) contained within the DSA?			
5. For each TSR specified (e.g., Safety Limit, LCO, LCS, specific "Directive Action"), do the technical bases take into account the assumptions or uncertainties that have the potential to impact the hazard/accident analyses?			
6. For each TSR specified (e.g., Safety Limit, LCO, LCS, specific "Directive Action"), are the technical bases for not considering specific operating modes provided?			
7. For each action statement contained within an LCO/LCS, does the technical bases allow for the conclusion that the margin of safety has not been compromised?			
8. For each action statement contained within an LCO/LCS, does the technical bases allow for the conclusion that the completion time for an action is acceptable?			
9. For each action statement contained within an LCO/LCS where actions partially compensate for the loss of a safety function, does the technical bases allow for the conclusion that the margin of safety has not been compromised?			

TECHNICAL SAFETY REQUIREMENTS REVIEW CHECKLIST

TSRs – Appendix B, Design Features			
Question	**Yes**	**No**	**Comments**
1. Is the information presented in a clear, logical, and concise manner that follows the format of the Appendix to DOE G 423.1-1?			
2. Is a detailed description of each vital passive component (including functions, dimensions, design criteria, applicable codes and standards, materials used, in-service inspection required, manufacturer, and all of the details that must be considered prior to alteration, modification, or replacement) discussed in a clear and concise manner?			
3. For cases where it is a safety concern, is the configuration and physical arrangement discussed? Are details pertaining to the design (e.g., configuration or physical arrangement, including dimensions) and the reasoning behind the design provided?			
4. For cases where the safe operation of the facility is dependent on any component being constructed of a particular material, is the component and system identified, as well as the special material involved, any in-service inspections required for the material or component, and any special operational considerations such as maximum/minimum temperature, pressure, flow, or chemical concentration?			
5. Are the site characteristics presented (such as the locations of public access roads, collocated facilities, facility area boundaries, site boundaries, nearest residence distances, etc.) if they are pertinent to the design feature function?			

TECHNICAL SAFETY REQUIREMENTS REVIEW CHECKLIST

DSA/TSR – Implementation Plan[1&2]			
Question	**Yes**	**No**	**Comments**
1. In the submittal letter or implementation plan submittal for a new DSA/TSR, does the contractor commit to using configuration management to maintain the new DSA/TSR during the development, review, and approval processes and prior to the effective date? The purpose of this commitment is to evaluate changes to the facility, the analysis, or both and to identify those that must be addressed in the new DSA/TSR prior to the effective date.			
2. In the submittal letter or implementation plan submittal for a new DSA/TSR, does the contractor formally address DSA/TSR implementation cost, scope, and schedule?			
3. In the submittal letter or implementation plan submittal for a new DSA/TSR, does the contractor provide a DSA/TSR effective date? Is the length of the implementation period within 90 days of SER issuance? [Note 1: Unless the effective date is specifically addressed in the SER, the DSA and TSR are effective immediately upon issuance of the SER per 10 CFR 830.207(b). Note 2: Configuration management costs for new DSAs/TSRs are directly related to the length of the implementation period. Therefore, DSA/TSR implementation should be of high priority and accomplished within 90 days of SER issuance.]			

[1] DSA/TSR implementation is defined as those activities that occur between the issuance of the SER and the effective date of the new DSA/TSR.

[2] These DSA/TSR Implementation Plan questions are only applicable to Environmental Management-funded programs (i.e., the Assistant Manager for Environmental Management and the Assistant Manager for Assets Utilization). The DSA/TSR Implementation Plan expectations were provided as Environmental Management Supplemental Guidance on DSA/TSR Implementation in a memorandum from Jessie Hill Roberson, EM-1, dated May 28, 2002.

HAZARD CATEGORIZATION DOCUMENTS GUIDANCE

Introduction.

The purpose of this guidance is to provide the Department of Energy Oak Ridge Office's (DOE-ORO's) expectations and review strategy for hazard categorization of nuclear facilities. Although DOE-STD-1104-96, Change Notice 3, REVIEW AND APPROVAL OF NUCLEAR FACILITY SAFETY BASIS DOCUMENTS (DOCUMENTED SAFETY ANALYSIS AND TECHNICAL SAFETY REQUIREMENTS), provides guidance for the review and approval of Documented Safety Analyses (DSAs) and Technical Safety Requirements (TSRs), this guidance conceptually utilizes relevant components of the Standard for the review of hazard categorization documents. ORO expects that the bases and assumptions used to support facility hazard categorization be:

- Sufficient in base information to understand and analyze the facility and its proposed operations,
- Technically accurate,
- Comprehensive in identifying the hazards of the facility including radioactive and hazardous materials,
- Appropriate in its application of HA techniques used to support final hazard categorizations, including preliminary hazard screenings,
- Appropriate in its application of sample (or inventory) data and the derivation of bounding inventories of radioactive and hazardous materials with justification as to why the inventories are bounding,
- Compliant with DOE-STD-1027-92, Change Notice 1, HAZARD CATEGORIZATION AND ACCIDENT ANALYSIS TECHNIQUES FOR COMPLIANCE WITH DOE ORDER 5480.23, NUCLEAR SAFETY ANALYSIS REPORTS, for the initial hazard categorization of the facility based strictly upon inventory alone,
- Compliant with DOE-STD-1027-92, Change Notice 1, for the final hazard categorization of the facility based upon analyses of "unmitigated release" of available radioactive and hazardous materials,
- Appropriate in considering the potential changes to physical form and dispersibility under the full range of potential unmitigated accident conditions that would be expected to occur within the facility,
- Correct in its application of the alternate airborne release fractions (ARFs) and respirable fractions (RFs) from DOE-HDBK-3010-94, Change Notice 1, AIRBORNE RELEASE FRACTIONS/RATES AND RESPIRABLE FRACTIONS FOR NONREACTOR NUCLEAR FACILITIES,
- Appropriate in its support of all assumptions used to reduce the inventory at risk (e.g., segmentation).

Hazard Identification.

Hazard categorizations must clearly identify the total hazardous material inventory, including the basis for assumptions used in extrapolating characterization data and references to where the data is documented. This includes derivation of the Material at Risk (MAR) and rationale for why radioactive and hazardous material inventory values are bounding.

It is recognized that at many retired facilities process knowledge may not be sufficient to quantify 100 percent of the material inventories subject to hazard categorization. Characterization is often needed to provide sufficient knowledge for supporting safe handling and proper management of hazardous/radioactive materials. Various characterization methods may be used including compilation and research of past operating records, intrusive sampling, and/or non-destructive examination techniques. These data are appropriate for hazard categorization provided they are sufficiently bounding.

For example, non-destructive examination techniques should fully account for instrument error when used to estimate material inventory. Acceptable approaches for hazard identification/characterization can be found in DOE-STD-1120-2005, Volumes 2 and 3, Sections 2 and 3, and DOE G 435.1-1, IMPLEMENTATION GUIDE FOR USE WITH DOE M 435.1-1, Chapter IV (Low-Level Waste Requirements).

Segmentation.

When using the segmentation allowance from DOE-STD-1027-92, Change Notice 1, Attachment 1, to reduce hazardous material inventory, the hazard categorization must present a convincing case that individual segments are truly independent. Justification must be provided that conclusively proves that features of the facility or activity precludes bringing material together or causing harmful interaction from common severe phenomena (i.e., hazardous material in one segment could not interact with hazardous material in another segment).

It is DOE-ORO's expectation that common severe phenomena include common scenarios that involve the potential release of radioactive and hazardous material. Common scenarios to be analyzed include fires, explosions, process upsets, etc. The determination of segmentation must consider the potential impact of these common scenarios and their propagation to adjacent buildings or facility segments. If the common scenario can propagate to an adjacent building, such that hazardous materials can be brought together as the result of the common scenario segmentation is not appropriate. In such a case, the radioactive and hazardous materials from these buildings or segments must be considered together for hazard categorization purposes.

Once facilities are categorized, DOE-STD-1027-92, Change Notice 1; DOE-STD-3009-94, Change Notice 3, PREPARATION GUIDE FOR U.S DEPARTMENT OF ENERGY NONREACTOR NUCLEAR FACILITY DOCUMENTED SAFETY ANALYSES; and DOE-STD-3011-2002, GUIDANCE FOR PREPARATION OF BASIS FOR INTERIM OPERATION (BIO) DOCUMENTS, require the review of all threats involving the potential release of radioactive and hazardous materials including Natural Phenomena Hazards (NPH) and extremely low probability external threats such as aircraft crashes. NPH and extremely low probability external threats are appropriately addressed by the hazard and accident analyses in the safety basis (SB) document and should not be included as common severe phenomena for segmentation, unless such phenomena cause harmful interaction of materials from these segments that would create new or different scenarios than were previously postulated for the individual segments. For example, if a seismic event causes radiological material from two segments to interact such that a criticality accident is possible, then material from both segments should be added together for categorization purposes.

This expectation is consistent with DOE Complex practices based on a review of other DOE site practices (Savannah River, Oak Ridge National Laboratory, Lawrence Livermore and Los Alamos National Laboratory, and West Valley).

10 CFR 830.202(c)(1) requires that the SB be kept current to reflect changes in the facility, work, and hazards. Contractors should maintain the conditions, parameters, and assumptions that form the basis of the segmentation and evaluate any change that may affect them (e.g., change in physical features, process, energy sources, operations, etc.)

The expectations for segmentation discussed above do not preclude the contractor from consolidating multiple facilities or activities into a common SB document, where those facilities share common features, missions or have other similarities that make a Master SB document approach advantageous (e.g., reduced costs). As discussed in the DOE-STD-3009-94, Change Notice 3, Section 3.3.2.2, *Hazard Categorization* the DSA must include the segment boundaries, individual segment categorizations, and the justification for any segmentation in terms of independence where segmentation is employed. Also, the DSA should provide the hazard breakdown, HA, and as appropriate, accident analysis (AA) by segment. This requirement must be meet whether the DSA is addressing multiple segments in a facility or multiple facilities or activities. 10 CFR 830, Subpart B, its implementation guides, and the safe harbor methodology must be followed regardless of whether multiple facilities or activities are consolidated into one SB document or not.

Initial Hazard Categorization.

The initial hazard categorization of the facility is based strictly on comparison of the total inventory of radionuclides to the DOE-STD-1027-92, Change Notice 1, (Table A.1) Threshold Quantities (TQ), as well as consideration of criticality mass limits for fissile materials (i.e., per the asterisk to Table A.1). Where multiple radionuclides are present, the fraction of each radionuclide to its Threshold Quantity (TQ) must be summed and compared to unity.

Facilities with radionuclide inventory below the DOE-STD-1027-92, Change Notice 1, TQ values for Hazard Category 3 can be categorized as “below Hazard Category 3” or “radiological” unless the facility contains fissile materials in quantities greater than the theoretical mass limits for criticality emergencies as specified in ANSI/ANS-8.1-1983. The facility would then be considered Hazard Category 2. Per DOE-STD-1027-92, Change Notice 1, credit may be taken if segmentation or if the nature of the process precludes the potential for a criticality. Segmentation includes processes were physical barriers exist such that a criticality cannot be achieved. Nature of process means that the form of material is inherently safe or that facility or process equipment is designed such that the formation of a critical mass for a particular form of fissile material cannot be achieved.

Hazard Analysis/Final Hazard Categorization.

The principal purpose of a HA is to systematically identify the hazards, the accident potentials, and the preventive and mitigative features through a comprehensive process of hazard identification and evaluation. For Final Hazard Categorization purposes, the essential elements of HA are: (1) the identification of the hazardous material quantities, form(s) and location(s); (2) evaluation of potential energy sources that could interact with hazardous materials and create a dispersive mechanism; and (3) consideration of MAR based on these factors.

When using the allowance from DOE-STD-1027-92, Change Notice 1, Section 3.1.2, *Final Hazard Categorization*, to finalize the facility’s categorization, the final hazard categorization must consider the “unmitigated release” of available hazardous material (e.g., don’t credit design features, engineered safety features such as containers, etc.). The adjustment in the facility’s categorization using credible release fractions can be based on material quantity, form, location, dispersibility, and/or interaction with available

energy sources but cannot consider safety features to prevent or mitigate a release. The Standard states that all assumptions used to reduce the inventory at risk should be supported in the hazard analysis. This includes the need to consider potential changes to physical form and dispersibility under a full range of potential accident condition initiators.

After applying the appropriate adjustments to the MAR, the final hazard categorization of the facility must be based on a comparison with the DOE-STD-1027-92, Change Notice 1, Threshold Quantities (using sum of the fractions where multiple radionuclides are present). The highest of those comparisons will dictate the Hazard Category of the facility.

When presenting the final hazard categorization of a facility which results in a finding of "below Hazard Category 3," it is not recommended to attempt to recreate the DOE-STD-1027-92, Change Notice 1, Hazard Category 3 model by calculating dose calculations as the basis for final hazard categorization. Instead, as discussed above, adjust the MAR and compare to the DOE-STD-1027-92, Change Notice 1, "Hazard Category 3 TQ" or compare the MAR to an adjusted "Hazard Category 3 TQ."

When an alternate release fraction is to be used for adjusting a facility's categorization, it must appropriately utilize the bounding results of the analysis of experimental data provided in DOE-HDBK-3010-94, Change Notice 1, to determine the appropriate ARFs and RFs under all postulated accident scenarios. Sources and/or methodologies other than DOE-HDBK-3010-94, Change Notice 1, may be used with DOE approval.

Hazard Categorization Basis and Assumptions.

The base information associated with a hazard categorization should provide adequate information to (1) identify the bounding radionuclide inventories at a facility; (2) substantiate any assumptions used in calculating inventories, and (3) provide a defensible basis to support HA associated with final hazard categorizations.

For facilities that have an initial or final categorization above Hazard Category 3, the basis and assumptions should be described within the documented safety analysis that is required by 10 CFR 830, Subpart B. Facilities that have an initial hazard categorization below Hazard Category 3 are not required to obtain DOE approval on the categorization. However, the basis and assumptions that support the initial hazard categorization should still be documented and provided to DOE for information purposes.

Final hazard categorizations that result in a determination of "below Hazard Category 3" based on a HA require DOE approval. Since Final Hazard Categorization Documents (FHCDs) are the primary SB Document for facilities determined to be below Hazard Category 3 by analysis, the documents should provide sufficient background information for DOE to understand the nature of the facility and its operations. Therefore, the FHCD should describe the facility, its mission, and the scope of its operations to the extent necessary to support HA discussions.

If a change is made or new information discovered that affects a condition, parameter, or assumption that helps form the basis for the hazard category downgrade, approved SB documents must be revised to reflect the change. This includes FHCDs prepared for radiological facilities downgraded below Hazard Category 3 by analysis. The revised FHCD must then be reviewed by DOE prior to making the change to ensure that the basis for the approval of the hazard category has not changed. The revised FHCD must provide justification that conclusively demonstrates that the change or new information does not adversely affect the Hazard Category or establishes a new Hazard Category.

Administrative Control.

The conditions, parameters, and assumptions that form the basis for the hazard category of the facility must be protected. These items should be protected and linked to an overall inventory control process. DOE-STD-1027-92, Change Notice 1, Section 3.1, *Radiological Hazards* states that "*Only facilities which fall below the Category 3 threshold are exempt from the requirements of DOE Order 5480.23 (NUCLEAR SAFETY ANALYSIS REPORTS). However, these facilities should have administrative controls in place to ensure minimum values are not exceeded through introduction of new materials.*" For facilities that are adjusting the facility's category based on form, dispersibility, segmentation, etc., the requirement to establish administrative controls (AC) to control the inventory of the facility should include the control of the conditions, parameters, and assumptions that form the basis of the hazard categorization. Examples of these inventory control process elements and assumptions (and how they may be changed) are as follows:

- Radionuclide inventory (increase in material to be stored or processed, change in the process, new sample data or analysis, discovery of new or different materials),
- Form of material (change in how materials are contained, processed, or treated, newly discovered material characteristic),
- Dispersibility (change in container, process, or treatment, discovery of new or different materials, change in type or intensity of energy sources, change in project environment [drier or wetter than assumed]),
- Interaction with available energy sources (change in adjacent facility or process, change in process, change in location, change in conditions surrounding area),
- Segmentation (change in physical features, change in process, change in energy sources, change in operations),
- Changes in the nature of processes that may affect criticality safety assumptions.

The contractor must maintain the assumptions and controls (e.g., inventory control) associated with a hazard categorization. 10 CFR 830.202(c)(1) requires that the SB be kept current to reflect changes in the facility, work, and hazards. Therefore, contractors should ensure that hazard categorizations (including below Hazard Category 3 radiological facilities) are revisited at least annually for any changes that may affect the approved hazard categorization controls or assumptions (e.g., introduction of a new energy source).

Reference Documents.

(a) Title 10, Code of Federal Regulations, Part 830, Subpart B, SAFETY BASIS REQUIREMENTS.

(b) DOE G 421.1-2, IMPLEMENTATION GUIDE FOR USE IN DEVELOPING DOCUMENTED SAFETY ANALYSES TO MEET SUBPART B OF 10 CFR 830, dated October 24, 2001.

(c) DOE G 435.1-1, IMPLEMENTATION GUIDE FOR USE WITH DOE M 435.1-1, dated July 9, 1999.

(d) DOE-STD-1027-92, Change Notice 1, HAZARD CATEGORIZATION AND ACCIDENT ANALYSIS TECHNIQUES FOR COMPLIANCE WITH DOE ORDER 5480.23, NUCLEAR SAFETY ANALYSIS REPORTS, dated September 1997.

(e) DOE-STD-1104-96, Change Notice 3, REVIEW AND APPROVAL OF NUCLEAR FACILITY SAFETY BASIS DOCUMENTS (DOCUMENTED SAFETY ANALYSES AND TECHNICAL SAFETY REQUIREMENTS), dated December 2005.

(f) DOE-STD-1120-2005, Volumes 1 and 2, INTEGRATION OF ENVIRONMENT, SAFETY, AND HEALTH INTO FACILITY DISPOSITION ACTIVITIES, dated April 2005.

(g) DOE-STD-3009-94, Change Notice 3, PREPARATION GUIDE FOR U.S. DEPARTMENT OF ENERGY NONREACTOR NUCLEAR FACILITY DOCUMENTED SAFETY ANALYSIS, dated March 2006.

(h) DOE-HDBK-3010-94, Change Notice 1, Volumes 1 and 2, AIRBORNE RELEASE FRACTIONS/RATES AND RESPIRABLE FRACTIONS FOR NONREACTOR NUCLEAR FACILITIES, dated March 2000.

(i) DOE-STD-3011-2002, GUIDANCE FOR PREPARATION OF BASIS FOR INTERIM OPERATION (BIO) DOCUMENTS, dated December 2002.

(j) EM-1 Memorandum, "*Supplemental Environmental Management (EM) Guidance for Implementing 10 CFR 830, Subpart B, Safety Basis Requirements*," dated May 28, 2002.

(k) ANSI 8.1 – 1983, NUCLEAR CRITICALITY SAFETY IN OPERATIONS WITH FISSIONABLE MATERIALS OUTSIDE REACTORS.

GUIDELINES FOR REVIEWING HAZARD ANALYSIS AND CONTROL SELECTION

1. Determine the adequacy of the hazards analyses by reviewing the assumptions used (e.g., initiating events, frequency estimated, material available for release, release fraction, meteorology, release duration, and location of potentially exposed personnel or the public). Ensure that an appropriate level of conservatism was incorporated into the analyses. However, remember that the analyses should not be artificially constructed such that release scenarios fail to obey fundamental physical laws or the practical operational needs of the facility. Preliminary hazard analyses should identify all potential scenarios that result in uncontrolled release of hazardous material. For the purposes of the technical review, uncontrolled release is defined as the failure of the primary means of containment used for a hazardous material (e.g., tank, drum, packaging, or piping).

2. Exercise judgment in determining those analyses or calculations where replication or independent verification by Department of Energy (DOE) is warranted. Review calculation notes as supporting analyses for safety documents. In addition, review the other documents that constitute the technical bases for hazard identification, hazard analyses, derivation of operational controls, surveillance frequency, functional classification of Structures, Systems, and Components (SSCs) and specific administrative controls (SACs). This may include the fire hazard analysis, the preliminary hazard analysis (HA), inventory data, nuclear criticality safety evaluations, and screening criteria. This review should determine the adequacy of the proposed safety basis (SB) document and ensure that the key inputs, assumptions, methods, etc., were appropriately incorporated into the SB document.

3. Review the proposed operational controls for the prevention or mitigation of potential accident scenarios to verify adherence to the proper hierarchy for selection of such controls. The selection precedence for such controls must be as follows:

   a. Engineered controls (i.e., SSCs) are preferred over administrative controls (AC).

   b. Passive engineered features are preferred over active engineered features.

   c. Accident prevention is preferred over mitigation.

   d. Selection of controls closest to the hazard is preferred to optimize the protection afforded to potential receptors (in-facility workers, collocated personnel, and the public).

   e. Selection of controls that prevent or mitigate the effects of multiple accident scenarios are preferred to optimize safety and facility operations.

4. For situations where the above hierarchy cannot be adhered to, apply engineering judgment to determine the optimum approach for ensuring that an adequate level of safety is achieved. Ensure that justification is provided in the controls selection of the documented safety analysis (DSA) when the above hierarchy is not adhered to.

5. When a tailored set of criteria is used as the methodology for supporting the classification of safety-related SSCs and SACs, pay particular attention in assessing the adequacy. The SB document and/or the safety evaluation report (SER) should distinguish these situations separately and include a full discussion of the merits of the determination made.

6. The evaluation guidelines (EG) provided in DOE-STD-3009-94, Change Notice 3, PREPARATION GUIDE FOR U.S. DEPARTMENT OF ENERGY NONREACTOR NUCLEAR FACILITY DOCUMENTED SAFETY ANALYSES, must be used for the following purposes:

   - To aid in determining those accident scenarios whose unmitigated risk warrant inclusion of controls for prevention or mitigation in the Technical Safety Requirements (TSR) (or other operational controls approved by DOE)

   - To determine the functional classification of the SSC and SAC controls required to prevent or mitigate the accident scenario (i.e., safety class, safety significant, or defense in depth [DID]).

Additional Guidelines:

----------NOTE----------
The following additional guidelines should be used as a qualitative tool to supplement the safe harbor methods in DOE-STD-3009-94, Change Notice 3. <u>These guidelines should only be used to facilitate discussion between cognizant subject matter experts</u> including facility and operational staff to enhance the judgment process inherent to correct implementation of DOE-STD-3009-94, Change Notice 3. <u>It is advised that the numerical guidelines are not to be construed as either risk acceptance nor compliance criteria.</u> These guidelines address the offsite public, hypothetical onsite worker, and facility worker.

NUCLEAR SAFETY RISK RANKING AND CONTROL SELECTION GUIDELINES

The following Nuclear Safety Risk Ranking Process and associated Control Selection Guidelines should be used as a qualitative tool to supplement the safe harbor methods in DOE-STD-3009-94, Change Notice 3. It is advised that the numerical guidelines are not to be construed as either risk acceptance nor compliance criteria. Table 1 identifies Consequence Levels and EG for the maximally exposed offsite individual and maximally exposed hypothetical onsite worker. Table 2 identifies the Risk Ranking Bins. Specific guidelines for application are summarized below.

In addition to the hierarchy of control preference discussion provided in Guideline # 3 above, the cost of implementation and maintenance of available controls should be considered as a part of control selection.

Unmitigated hazard events should be evaluated in accordance with the Tables 1 and 2 and guidelines provided herein.

Risk Class I events must be protected with SSCs, SACs, and TSRs. For offsite public protection, Safety Class SSCs, SACs, and TSRs are required for radiological events that challenge 25 rem Total Effective Dose Equivalent (TEDE) offsite in accordance with Appendix A of DOE-STD-3009-94, Change Notice 3. Events resulting in high offsite radiological consequences must be moved forward into accident analysis for determination of safety classification, without consideration of frequency.

Risk Class II events must be considered for protection with TSRs and safety SSCs and SACs. The consideration of control(s) should be based on the effectiveness and feasibility of the considered controls along with the identified features and layers of DID. Events resulting in high offsite radiological consequence must be moved forward into accident analysis for determination of safety classification, without consideration of frequency.

Risk Class III events are generally protected by the safety management programs (SMPs). These events may be considered for DID SSCs and SACs in unique cases.

Risk Class IV events do not require additional measures.

For facility worker protection, significant hazardous events are evaluated for appropriate controls in accordance with DOE-STD-3009-94, Change Notice 3. The activity-specific controls (e.g., Personal Protective Equipment (PPE) and hot work permit) should be developed as part of a work control process, not as a specific part of the SB per 10 CFR 830. The actual implementation of work control process should be reviewed as part of the annual Integrated Safety Management System (ISMS) verification. For those events identified in the HA that require a control that is not contained in an SMP, a specific "Directive Action" may be established.

DID is a philosophy that ensures the facility is operated in a safe manner through multiple means. DID features include the entire suite of safety controls, encompassing Safety Class and Safety Significant SSCs and SACs, ACs, SMPs, and other engineered controls. Only the significant contributors to DID should warrant TSR designation. Those passive features that provide significant safety benefit are covered by the TSR Design Features (DF) Section. Compensatory measures should be provided for those existing TSR DF that do not meet functional requirements. DOE G 423.1-1, IMPLEMENTATION GUIDE FOR USE IN DEVELOPING TECHNICAL SAFETY REQUIREMENTS provides additional guidance for consideration.

Many important aspects of the DID strategy are implemented through the SMPs. The holistic approach embedded in the SMPs and their effective implementation as part of the ISMS must continue to optimize the intended safety benefits. The discipline imposed by the SMPs extends beyond simply supporting the assumptions made in the HA and is an essential part of DID safety posture.

The radiation protection of the workers during normal operations is governed by 10 CFR 835, OCCUPATIONAL RADIATION PROTECTION, and is discussed in the Radiation Protection Chapter of the DSA.

TABLE 1: CONSEQUENCE LEVELS AND RISK EVALUATION GUIDELINES

Consequence Level	Offsite Public MOI[1, 3]	Hypothetical Onsite Worker MEI[2] location not less than 100 meters or facility boundary from the point of release For elevated doses use point of highest doses	Site Facility Worker Involved worker[2] within facility boundary Use highest dose within facility boundary
High	**Considerable off-site impact on people or the environs.** **> 25 rem TEDE or** **> ERPG-2/TEEL-2**	**Considerable on-site impact on people or the environs.** **> 100 rem TEDE or** **> ERPG-3/TEEL-3**	**For Safety Significant designation, consequence levels such as prompt death, serious injury, or significant radiological and chemical exposure, should be considered.**
Moderate	**Only minor off-site impact on people or the environs.** **≥ 1 rem TEDE or** **> ERPG-1/TEEL-1**	**Considerable on-site impact on people or the environs.** **≥ 25 rem TEDE or** **> ERPG-2/TEEL-2**	
Low	**Negligible off-site impact on people or the environs.** **< 1 rem TEDE or** **< ERPG-1/TEEL-1**	**Minor on-site impact on people or the environs.** **< 25 rem TEDE or** **< ERPG-2/TEEL-2**	

NOTES:

DSA: Documented Safety Analysis
MOI: Maximally-Exposed Offsite Individual
SSC: structures, systems, or components
SAC: Specific Administrative Control
MEI: Maximally-Exposed Collocated Worker
SMP: Safety Management Programs, Chapters 6-17 of the DSA
TSR: Technical Safety Requirements

[1] Offsite consequences that challenge 25 rem must be protected with Safety Class SSCs or SACs independent of frequency.
[2] Beyond safety-significant SSCs and SACs designated for worker safety and their associated TSR coverage, additional worker safety issues should be covered in TSRs only by programmatic administrative controls on overall safety management programs.
[3] Hazard Analyses qualitatively evaluate public consequences at the shortest distance to the site boundary. Accident Analyses must utilize 95% X/Q for public consequence determination.

TABLE 2: QUALITATIVE RISK RANKING BINS[4]

Consequence Level	Beyond[5] Extremely Unlikely Below 10^{-6}/yr	Extremely Unlikely 10^{-4} to 10^{-6}/yr	Unlikely 10^{-2} to 10^{-4}/yr	Anticipated 10^{-1} to 10^{-2}/yr
High Consequence	**III**	**II**	**I**	**I**
Moderate Consequence	**IV**	**III**	**II**	**I**
Low Consequence	**IV**	**IV**	**III**	**III**

[4] Industrial events that are not initiators or contributors to postulated events are addressed as standard industrial hazards in the hazard analysis.
[5] For external events, frequency of occurrence below 10^{-6}/yr conservatively calculated or 10^{-7}/yr realistically calculated are Beyond Extremely Unlikely.

TECHNICAL SAFETY REQUIREMENTS GUIDANCE

1. NO LCO = NO MODE = NO 3.0's & 4.0's.

2. Definitions: Once Standard definitions are agreed too, need to stick to that Standard unless there is a special case.

   a. MODES – shall be determined based on the specific facility – the OPERATION MODE is somewhat generic – can delete/modify some of the words as necessary for particular facility and Limiting Conditions for Operation (LCOs).

   b. STANDBY MODE needs to be evaluated for extent of activities in respect to LCOs and 3.0.3 wording.

3. Section 1.4, Logical Connectors; and Section 1.5, Completion Times - These should be consistent with DOE G 423.1-1, IMPLEMENTATION GUIDE FOR USE IN DEVELOPING TECHNICAL REQUIREMENTS and the document of examples.

4. Section 1.6, Frequency -- These should be consistent with DOE G 423.1-1 and the document of examples.

5. LCO 3.0.3 – needs to be evaluated for each Technical Safety Requirements (TSR) (cannot assume "STANDBY MODE" is acceptable) [can always use the generic words "the facility shall be placed in a safe condition."]

6. LCO 3.0.x's and Surveillance Requirement (SR) 4.0.x's (and associated basis) are generic and should be followed unless there are special situations. (e.g., If there is a special situation, the 3.0.x or 4.0.x can be modified based on the specifics; however, the applicable justification must be modified.)

7. LCO statement: shall be as precise as possible while <u>stating the lowest functional capability or performance level</u> required for safe operation.

8. MODE Applicability – shall state the mode in which the LCO must be met. Each MODE stated shall be defined in Section 1.3.

9. PROCESS AREA Applicability – shall be specified for each LCO. Table 1.1 in the definition Section shall describe each PROCESS AREA used in the specific TSR.

10. SRs should contain short descriptions of the type of surveillance required and contain those requirements needed to ensure compliance with the LCO (e.g., the specific values, limits, etc., should be stated in the actual SR).

11. Administrative Controls Section shall designate the person in authority allowed to approve emergency actions that depart from the approved TSR [see 10 CFR 830.205(b)].

12. Minimum Staffing shall provide the minimum staffing required to execute the LCO requirements. Sometimes additional staffing may need to be stated based on specific Administrative Controls (AC).

13. Section 5.4 and 5.6.2 are generic. These should be consistent with DOE G 423.1-1 and the document of examples.

14. Procedures and Programs shall be based on the Documented Safety Analysis (DSA). Generic descriptions of corporate programs are expected with statement like – "*The following elements of the xxxx Program are credited and implemented in a facility procedure:*" with bullets following based on the DSA. [**NOTE**: Ensure all DSA/TSRs of a contractor have the same generic Standard Program Descriptions unless a facility has special issues and needs to modify these corporate descriptions.] Need to discuss with DOE the issues and need for modification.

15. TSR treatment of safety controls can be either programmatic ACs or Specific Administrative Controls (SACs). (See DOE-STD-1186-2004 for additional guidance.) The level of treatment in the TSR depends on the credit level in the DSA. Examples are as follows:

    a. Programmatic – A combustible loading program shall be implemented for the facility.

    b. SAC – Combustible liquids shall be less than 100 pounds within the facility.

    The level of the elements depends on the credit level in the DSA analysis. As can be seen, these two examples all have basically the same generic result in the facility; however, the specificity of the SAC requirement stems from credit taken in the DSA hazard/accident analysis. Need to justify in the DSA why the level for each element is acceptable to achieve the stated purpose. SACs can be incorporated into the TSR as either LCOs or specific "Directive Actions."

16. Generally, Section 5.10, Operability Principles, is only needed when LCOs are present in the TSR.

17. Section 6, Design Features (DF), shall state the structures, systems, and components (SSCs) and the specific DF being credited. The details of the design are contained in the DSA. The TSR wording is brief.

18. TSR shall be applicable at all times per the DSA. Any deviation from this must be discussed with DOE and justification of the need for the deviation and technical basis must be provided early, prior to submittal.

19. SR shall be sufficient to protect the requirements of the LCO statement.

20. LCO CONDITIONS shall be based on the LCO statement and lowest functional requirement for OPERABILITY.

21. TSR level controls for worker safety are expected when a postulated event is estimated to result in prompt worker fatality or serious injuries or significant radiological or chemical exposure to workers (serious injuries = medical treatment for immediately life-threatening or permanently disabling injuries, e.g. loss of eye, loss of limb).

22. The most significant aspects of defense-in-depth and worker safety are subject to designation as Safety-Significant SSCs and SACs and require coverage by the TSR. The DSA shall provide the discussion of this decision and ensure elements are flowed to the TSR at the proper level (See comment #15).

23. The functional requirements for Safety-Class and Safety-Significant SSCs and SACs, that are discussed in Chapter 4 of the DSA, shall flow to the TSR in the appropriate manner (LCO, DF, Specific "Directive Action"). This includes protection of those initial conditions and assumptions which need TSR coverage.

24. Chapters 4 and 5 of the DSA (3009 documents), shall be consistent with the TSR.

25. Section 1.1 -- Section 1.1.1, Technical Safety Requirement Applicability, will refer to the DSA for the activities that are allowed under the TSR.

JUSTIFICATION FOR CONTINUED OPERATIONS CONTENT AND APPLICABILITY EXPECTATIONS

Justifications for Continued Operations (JCOs) provide the formal means to request Department of Energy (DOE) approval to amend the current, approved safety basis (SB) for defined, discreet periods of time when the current, approved SB requirements cannot be fully met. Hence, JCOs modify the existing SB during the period of approval. Therefore, any long term operations should require a permanent change to the SB. Typically, JCOs are necessary in two distinct situations:

(1) A positive Unreviewed Safety Question Determination (USQD) or potential Unreviewed Safety Question (USQ) has been declared by the contractor or DOE and it is desired to continue/resume operations prior to completion and/or DOE approval of a full safety evaluation. Additionally, it must be possible to demonstrate a reasonable level of risk. To enable DOE to accept the risk implied by a positive USQD, the risk must be clearly defined. (**NOTE**: Although it may not be possible to completely and quantitatively define the risk prior to full completion of the safety evaluation phase of the USQ process, enough information must be supplied to justify a reasonable conclusion regarding the safety of the activity.)

or

(2) DOE approved controls cannot be met and it is desired to temporarily resume operations with out satisfying the controls. (**NOTE**: JCOs can be developed for most situations where full facility compliance with the SB cannot be achieved but a reasonable level of risk can be demonstrated.)

With the above in mind, it is the Department of Energy – Oak Ridge Office's expectation that JCO submitted to DOE to contain as a minimum:

1. Background information to allow a full understanding of the nature and evolution of the safety issue.

2. Identification of the affected SB document(s) with specific reference to Sections that are impacted.

3. The probability of the potential adverse event and the worst credible consequences based on an adequate and current understanding of issues.

4. The details regarding any interim controls proposed to be enacted to control the risk. Mitigative actions may be directed at minimizing probability of occurrence and/or the consequences of the potential occurrence.

5. A specific expiration date based on one or more of the following:

   - a specific USQ/analysis completion time line
   - an aggressive condition correction
   - an SB control being reinstituted
   - a commitment to provide DOE a more complete analysis
   - the final safety evaluation to DOE and associated approval.

6. A schedule for actions if multiple actions are required to address resolution of the issue which necessitated the JCO.

7. A commitment to update DOE on the status of JCOs on a periodicity related to importance and progress toward completion of milestones described in the JCO.

INACTIVE WASTE SITES VERIFICATION REPORT FORMAT AND CONTENT

The Office of Environmental Management (EM) recently prepared a Final Hazard Categorization that applies to Inactive Waste Sites (IWS) at Department of Energy (DOE) EM sites. This approach designates inactive waste sites as "below Hazard Category 3" when they meet the terms and conditions established in the EM-1 Memorandum (Memorandum from Roberson to DOE field sites, "*Hazard Categorization of Environmental Management Inactive Waste Sites as less than Hazard Category 3*," dated September 17, 2002). The contractors should utilize this approach to comply with 10 CFR 830, Subpart B.

It is expected that the final hazard categorization will save the Department significant resources, since a documented safety analysis will not be needed for these facilities nor will a Safety Evaluation Report (SER) be necessary for each inactive waste site. In order to use this approach, the contractors are requested to verify and document that subject facilities meet the conditions of approval as established in the Attachments to the EM-1 Memorandum on IWS categorization.

The following information should be submitted to DOE:

(1) A listing of IWS that meet the terms and conditions for approval in the EM-1 Memorandum on IWS categorization;

(2) A brief description of each IWS, including a summary of the types of hazardous materials being stored;

(3) Completion of the checklist in Appendix A (Checklist For Compliance With IWS "Terms and Conditions") (including the basis for meeting each item); and

(4) Commitments (i.e., programs, procedures and controls) that will ensure IWS will not deviate from the "conditions for approval" specified in the EM-1 Memorandum on IWS categorization now or in the future.

Review of safety basis (SB) documentation submitted by a contractor for a proposed IWS should verify and validate the information provided by the contractor, to ensure that the subject IWS meets the conditions of approval specified in the EM-1 Memorandum on IWS categorization, and that there is an adequate basis for demonstrating compliance with each item on the prescribed checklist. Acceptable bases may include references to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or Resource Conservation and Recovery Act (RCRA) related documents, hazard assessment documents, technical reports, or relevant procedures; demonstration that certain hazards or conditions are not physically plausible (e.g., plutonium concentration limit for criticality is not challenged because plutonium was never stored/disposed at the site); and descriptions of physical features and/or conditions that may be present at the IWS.

The review of contractor submittals for proposed IWS should follow a graded approach, based on requirements of ORO O 420, Chapter XIII, Change 3, SAFETY BASIS DOCUMENTS REVIEW SYSTEM.

The verification and validation review for each IWS should include the following elements:

(1) Review of the completed checklist for compliance with each of the required terms and conditions specified in the EM-1 Memorandum on IWS categorization.

(2) Confirmation that a technical basis is specified for each item in the checklist for all facilities. In addition, the entries for each checklist should be verified by reviewing the specified source documents to confirm that the technical basis is adequate.

(3) Visual inspections and walk-downs of each proposed IWS facility by the review team to inspect the site conditions and validate checklist entries. If any facility cannot be visually inspected by the review team, the explanation must be documented.

Results of the review for each proposed IWS facility should be documented by the reviewer(s). Any comments generated during the review process will be documented and resolved in accordance with the comment resolution process specified in ORO O 420, Chapter XIII, Change 3. If the submittal is determined to be technically adequate, a Verification Report (VR) will be prepared by the reviewer(s) recommending the approval of the proposed facility as an IWS and documenting any conditions of approval. The VR will be submitted for concurrence and approval. (See ORO O 250, Chapter XI, Change 2, DELEGATIONS AND AGREEMENTS, for information concerning approval authority delegation.) The VR is similar in format and content to an abbreviated SER consistent with the graded approach and commensurate with the complexity and hazards of the facility under review. A suggested outline for the VR is presented in Appendix B (Inactive Waste Site Verification Report Suggested Outline).

Checklist for compliance with IWS "Terms and Conditions"

IWS Name:			Is condition of Approval Met?		
			Yes	No	Basis
1	Applies only to inactive waste sites (ISW) as defined in Attachment 1 to EM-1 Memorandum on Inactive Waste Site Categorization. Meets all of the following definitions:				
	1a	IWS contains no above ground structures/containers that are contaminated or used to store wastes.			
	1b	IWS does not contain below-grade facilities/structures with human access or active provision of services (e.g., ventilation or steam).			
	1c	Intrusive activities are not authorized at the IWS (e.g., waste sampling/waste retrieval).			
	1d	IWS is not an Evaporation Pond (unless it meets criteria provided in Attachment 2).			
	1e	IWS does not contain fissile materials such that there is a potential for criticality from water intrusion or material rearrangement.			
	1f	IWS does not contain explosives or chemicals that might react with sufficient energy to cause a significant release (i.e., breach overburden and disperse materials).			
	1g	IWS does not contain unvented tanks whose contents could pressurize.			
2	IWS is regulated under RCRA and/or CERCLA.				
	2a	RCRA/CERCLA requirements are in place. These include surface and groundwater monitoring, public access limitations, surveillance and maintenance.			
3	Subject to the all of the following controls as identified in Attachment 2 to EM-1 Memorandum on Inactive Waste Site Categorization.				
	3a	Soil overburden or engineered cap is in place that provides adequate shielding, barrier to intrusion and confinement of hazardous materials.			
	3b	IWS has identified safe work zones and access controls in accordance with 29 CFR 1910.120 (HAZWOPER) and 10 CFR 835.			
	3c	Radiation Protection Programs and associated controls are in place that meet 10 CFR 835, including monitoring, entry control, posting and labeling, recordkeeping, training, ALARA, and dose limits.			
4	There are no postulated accident events beyond those analyzed in Attachment 3 to EM-1 Memorandum on Inactive Waste Site Categorization (e.g., fissile material concentrations in soil below levels of criticality concern, no overpressurization of unvented tanks, protective overburden at sufficient depth, material released in inadvertent penetration scenario doesn't challenge DOE-STD-1027-92, Change Notice 1, HC3 criteria of 10 rem at 30 meters, etc).				

INACTIVE WASTE SITE VERIFICATION REPORT SUGGESTED OUTLINE

Cover/Title Page.

Signature Page.

- As specified in the assigning line organization's review and approval process.

List of Acronyms.

Revision Log.

- Revision number, brief description of revision, and approval date.

Table of Contents.

Executive Summary.

1.0 Introduction.

- Purpose of VR and brief description of proposed IWS facility.

2.0 Review Process.

- Brief description of the verification review process, including reference documents consulted, and dates of visual inspection and facility walk-downs.

3.0 Basis For Approval.

- Verification that proposed IWS meets definition established in the EM-1 Memorandum on IWS categorization,
- Verification that proposed IWS is regulated under currently binding RCRA permits/orders/agreements and/or CERCLA regulations/agreements,
- Verification that proposed IWS has appropriate hazard controls in place as specified in the EM-1 Memorandum on IWS categorization, and
- Verification that proposed IWS does not contain hazards or conditions that exceed the hazard analysis assumptions specified in the EM-1 Memorandum on IWS categorization.

4.0 **Conditions of Approval**.

- Conditions of approval, upon which DOE approval is contingent, if any.

5.0 Conclusions.

- Brief statement of overall results of the verification review.

6.0 References.

NUCLEAR CRITICALITY SAFETY NOT CREDIBLE ARGUMENT GUIDANCE

Key Expectations.

Nuclear Criticality Safety (NCS) "Not Credible" Argument must CLEARLY indicate:

a. Assumptions;
b. Interfaces with and/or reliance upon other Safety Management Programs; and
c. Controls (if any) necessary to maintain integrity of "not credible" argument. If reliance on existing Documented Safety Analysis (DSA) level controls is used then this interface must be clearly identified.

DSA must:

a. Include a discussion of the corporate NCS program if fissile material is present in the facility. This discussion shall provide a clear link to the NCS report produced to document the "not credible" argument.
b. Clearly identify the DSA assumptions and/or controls used to support the "not credible" argument. This includes those controls and assumptions already in the DSA which the NCS analysis takes credit for AND controls or assumptions rolled up into the DSA from the NCS report.

Unreviewed Safety Question Determination (USQD) Process must:

a. Ensure that facility or process changes that may affect the assumptions and controls in the DSA identified as supporting the NCS "not credible" argument are reviewed by the NCS staff.

DISCUSSION:

During the DSA development process, the hazard analysis may determine that criticality is a hazard that needs further evaluation. It is the Department of Energy (DOE) expectation that the contractor facility safety analyst and NCS staff jointly evaluate whether or not accidental criticality is a "credible" hazard for the facility (or process). If the conclusion is that an accidental criticality is "not credible" then the basis for not carrying the criticality accident forward must be included in the DSA. Furthermore, the assumptions and controls should be protected by incorporation into the appropriate Sections of the DSA.

It is recognized that the NCS staff already makes determinations regarding the credibility of criticality accidents for determining if criticality accident alarm coverage is required for a process or facility. It is perfectly appropriate for this existing process to be augmented as necessary so as to be able to also serve as the basis for the DSA hazard categorization of "not credible" for criticality.

The DSA discussion on inadvertent criticality shall discuss the corporate NCS program and that the corporate program has determined that an accidental criticality is not a credible hazard. This discussion shall provide a clear link to the NCS report supporting the "not credible" conclusion. Any assumptions and controls from the "not credible" argument that are protected at the DSA level shall be designated as supporting the NCS "not credible" argument and a reference back to the NCS basis document shall be provided. It is anticipated that this will allow the USQD process to return to the NCS staff for an evaluation of the potential impacts of any facility or process changes to the NCS "not credible" argument.

UNREVIEWED SAFETY QUESTION PROCEDURE REVIEW PLAN

U. S. Department of Energy
Oak Ridge Office

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1.0 PURPOSE.

Section 830.203 (b) and (c) require the Department of Energy (DOE) approval of the contractor Unreviewed Safety Question (USQ) procedure. This Review Plan establishes a formal process and outlines guidance for Oak Ridge Office (ORO) to conduct the procedure review.

2.0 INTRODUCTION.

Section 830.203, "*Unreviewed Safety Question Process*," applies to all Category 1, 2 and 3 nuclear facilities. Changes, whether temporary or permanent, to a nuclear facility require application of a USQ process. The process ensures that the safety basis (SB) for a DOE nuclear facility is not undermined by changes in the facility, the work performed, the associated hazards (nuclear and non nuclear), or other factors that support the adequacy of the SB.

The USQ determination is not a substitute for a safety analysis; it merely serves as a benchmark for whether the SB is being preserved. A safety analysis may show that a proposed change is safe, yet the USQ determination may find that the change is a USQ and hence requires DOE approval prior to implementation.

Section 830.203(c) requires DOE to approve USQ procedures for contractors with new facilities via Safety Evaluation Reports (SERs). SERs will be used to document ORO's review and approval of USQ procedures for contractors with new and existing facilities.

3.0 REFERENCES.

(a) Title 10, Code of Federal Regulations, Part 830, NUCLEAR SAFETY MANAGEMENT.

(b) DOE O 231.1A, Change 1, ENVIRONMENT, SAFETY, AND HEALTH REPORTING, dated June 3, 2004.

(c) DOE G 424.1-1A, IMPLEMENTATION GUIDE FOR USE IN ADDRESSING UNREVIEWED SAFETY QUESTION REQUIREMENTS, dated July 24, 2006.

(d) ORO O 250, Chapter XI, Change 2, DELEGATIONS AND AGREEMENTS, dated April 18, 2006.

(d) ORO O 420, Chapter XIII, Change 3, SAFETY BASIS DOCUMENTS REVIEW SYSTEM, dated August 31, 2006.

4.0 DEFINITIONS.

Graded approach means the process of ensuring that the level of analysis, documentation, and actions used to comply with a requirement are commensurate with:

(1) The relative importance to safety, safeguards, and security;

(2) The magnitude of any hazard involved;

(3) The life cycle stage of a facility;

(4) The programmatic mission of a facility;

(5) The particular characteristics of a facility;

(6) The relative importance of radiological and nonradiological hazards; and

(7) Any other relevant factor.

The graded approach may not be used in implementing the USQ process or in implementing technical safety requirements.

JUSTIFICATION FOR CONTINUING OPERATION (JCOS) is an approval with technical justification to operate temporarily beyond the approved SB, analysis, or controls.

MARGIN OF SAFETY is the range between two conditions. The first is the most adverse condition estimated or calculated in safety analyses to occur from an operational upset or family of related upsets. The second condition is the worst-case value known to be safe, from an engineering perspective (i.e., minimum acceptable limit for operation under normal and specific failure condition). This value would be expected to be related to the condition at which some accident prevention or mitigation action must be taken in response to the upset or accident, as required by a DOE-approved hazard control documents, not the actual predicted failure point of some component. Hazard control documents may be Technical Safety Requirements (TSRs) or they may be in another form, as permitted by 10 CFR 830.205 for certain environmental restoration activities.

POTENTIAL INADEQUATE SAFETY ANALYSIS (PISA) means an inadequacy exists in a documented safety analysis that calls into question information relied upon for authorization of operations.

RECORD means a completed document or other media that provides objective evidence of an item, service, or process.

SAFETY BASIS means the documented safety analysis and hazard controls that provide reasonable assurance that a DOE nuclear facility can be operated safely in a manner that adequately protects workers, the public, and the environment.

SAFETY CLASS STRUCTURES, SYSTEMS, AND COMPONENTS or SPECIFIC ADMINISTRATIVE CONTROLS (SC SSC or SAC) means the structures, systems, or components, including portions of process systems, or specific limits or actions whose preventive or mitigative function is necessary to limit radioactive hazardous material exposure to the public, as determined from safety analyses.

SAFETY EVALUATION REPORT (SER) means the report prepared by DOE to document:

(1) The sufficiency of the contractor's USQ procedure;

(2) The extent to which a contractor has satisfied the requirements of Subpart B of this part; and

(3) The basis for approval by DOE of the USQ procedure, including any conditions for approval.

SAFETY SIGNIFICANT STRUCTURES, SYSTEMS, AND COMPONENTS or SPECIFIC ADMINISTRATIVE CONTROLS (SS SSC or SAC) means the structures, systems, and components or specific limits or actions which are not designated as safety class structures, systems, and components or SAC, but whose preventive or mitigative function is a major contributor to defense in depth and/or worker safety as determined from safety analyses.

UNREVIEWED SAFETY QUESTION (USQ) means a situation where:

(1) The probability of the occurrence or the consequences of an accident or the malfunction of equipment important to safety previously evaluated in the documented safety analysis could be increased;

(2) The possibility of an accident or malfunction of a different type than any evaluated previously in the documented safety analysis could be created;

(3) A margin of safety could be reduced; or

(4) The documented safety analysis may not be bounding or may be otherwise inadequate.

USQ process means the mechanism for keeping a SB current by reviewing potential unreviewed safety questions, reporting unreviewed safety questions to DOE, and obtaining approval from DOE prior to taking any action that involves an unreviewed safety question.

5.0 RESPONSIBILITIES.

5.1 Line Assistant Managers.

a. Ensure the contractors develop USQ procedures in accordance with 10 CFR 830.

b. Assign the reviews of contractor USQ procedures to reviewers that meet the qualification requirements specified in ORO O 420, Chapter XIII, Change 3, SAFETY BASIS DOCUMENTS REVIEW SYSTEM.

NOTE: For the contractors of Office of Nuclear Energy facilities where approval authority has not been delegated, transmit the USQ procedures directly to the Cognizant Secretarial Officer.

c. Resolve comments/issues that cannot be satisfactorily resolved by the reviewer(s).

d. Ensure that SERs are developed to document the review and basis for approval of the submitted USQ procedures.

e. Ensure that SERs are properly reviewed.

f. Approve SERs and their corresponding USQ procedures in accordance with ORO O 420, Chapter XIII, Change 3, SAFETY BASIS DOCUMENTS REVIEW SYSTEM; and the assigning line organization's review and approval process where the Approval Authority

has been delegated to an Assistant Manager (AM). (See ORO O 250, Chapter XI, DELEGATIONS AND AGREEMENTS, for information concerning approval authority delegation.).

g. Where Approval Authority has not been delegated to the AM, concur with the SERs and obtain approval of the USQ procedures in accordance with ORO O 420, Chapter XIII, Change 3 and the assigning line organization's review and approval process. For Office of Nuclear Energy facilities where Approval Authority has not been delegated, transmit the SB document to the Cognizant Secretarial Officer. All requests for Headquarters (HQ) approval should be transmitted through the ORO Manager to the Approval Authority.

5.2 Reviewer(s).

a. Obtains a copy of contractor USQ procedure(s) as assigned by the line AM or designee.

b. Enlists the help of a review team, as necessary.

c. Reviews the USQ procedure(s) in accordance with ORO O 420, Chapter XIII, Change 3, and the assigning line organization's review and approval process. The checksheet in Appendix A (USQ Procedure Requirements Checksheet) may be used to review each elements identified in Review Process below.

d. Promptly communicates comments/issues generated during the review to the contractor through the Contracting Officer's Representative (COR) in accordance with ORO O 420, Chapter XIII, Change 3, and the assigning line organization's review and approval process. Elevates areas where agreement cannot be reached to the responsible line AM.

e. Prepares SERs to document the USQ procedure reviews and the basis for their approval in accordance with ORO O 420, Chapter XIII, Change 3, and the assigning line organization's review and approval process.

6.0 REVIEW PROCESS AND METHODOLOGY.

The USQ procedures must be formally transmitted from the contractor to the responsible line AM through the COR. This review plan encompasses the USQ procedure(s) delivered to DOE ORO under Section 830.203. This review plan does not include program implementation. Elements of the discussion in the Sections below should be evident in the contractor USQ procedure. Although the suggested approaches provided in DOE G 424.1-1A, IMPLEMENTATION GUIDE FOR USE IN ADDRESSING UNREVIEWED SAFETY QUESTION REQUIREMENTS, are not construed as requirements in appraising compliance with 10 CFR 830, this guidance does provide supplemental information regarding the rule and provides an acceptable method for implementing the requirement. A checksheet is provided in Appendix A to assist with the evaluation of the contractor USQ procedure. The reviewer(s) may simply check the applicable "Yes" or "No" box or may choose to reference the applicable Section of the contractor procedure. A "No" entry for an attribute associated with DOE G 424.1-1A does not necessarily mean that the procedure is inadequate. The completed checksheet shall contain the contractor procedure number and revision and be signed and dated by the reviewer(s).

6.1 ROLES AND RESPONSIBILITIES <DOE G 424.1-1A, 3.1>.

a. Lines of Inquiry - Does the USQ procedure discuss:

1. Organizational roles and responsibilities related to the implementation of the program including specific responsibilities of those performing, reviewing and approving Unreviewed Safety Question Determination (USQD)?

2. Requirements that USQ screenings and USQDs be reviewed technically by a person independent in the sense that he/she has not been involved in the preparation of the USQ documents (person does not have to be organizationally independent)?

6.2 INTEGRATION <DOE G 424.1-1A, 3.1>.

a. Lines of Inquiry - Does the USQ procedure indicate that:

1. The USQ process is integrated into the facility's change control processes?

2. The change processes ensure that the USQ process is integrated into existing procedures or that new procedures are developed, as necessary and that the need for completion of a USQD is not overlooked?

b. Discussion:

The USQ process is intended to be implemented as part of a change control process that includes generalized steps for: (1) identifying and describing the temporary or permanent change; (2) technical reviews of the change; (3) management review and approval of the change; (4) implementation of the change; and (5) documenting the change. As part of the technical reviews of a change, the contractor should perform the appropriate type of safety analysis to ascertain if the change is indeed safe. This is accomplished separately from the USQ process. The USQ process is used subsequently to determine if final approval of the change by the contractor is sufficient or if DOE approval must be obtained.

6.3 TEMPORARY OR PERMANENT CHANGES IN THE FACILITY <830.203 (d) (1)>.

a. Lines of Inquiry- Does the USQ procedure require that:

1. Temporary and permanent changes in the facility as described in the existing Documented Safety Analysis (DSA) be evaluated by USQ determinations?

2. Both temporary and permanent changes in the facility and procedures which can affect the safety analysis or the SC or SS SSCs be evaluated for potential USQs?

3. Changes to SSCs that are outside the SB (where those changed may impact the safety analyses or the SC or the SS SSCs or SACs) be evaluated for potential USQs?

4. Changes to the transportation activities which are covered by 10 CFR 830 be evaluated for potential USQs?

b. Discussion:

Understanding the term "change" as it applies to modes of operation or facility processes is also important. Temporary changes to the nuclear facility should be evaluated to determine whether a USQ exists.

Changes to SSCs that are not explicitly discussed in the safety analyses should not be excluded from the USQ process, since changes to these SSCs may affect the ability of a safety SSC or SAC to perform its intended function. In addition, facility changes should be evaluated for increases in consequences to workers.

Changes in transportation activities should be evaluated via the USQ process.

The necessity to distinguish between changes and routine maintenance activities is an important consideration. Routine maintenance activities (except those that are not enveloped by current analyses or that might violate a TSR) do not require review under Section 830.203.

6.4 TEMPORARY OR PERMANENT CHANGES IN THE PROCEDURES <830.203 (d) (2)>.

a. Lines of Inquiry – Does the USQ procedure require:

1. Temporary or permanent changes in the procedures as described in the existing Documented Safety Analysis be evaluated by USQ determinations?

2. New or changes to processes involving criticality safety be evaluated for potential USQs?

b. Discussion:

Changes to procedures that are identified in the facility Documented Safety Analysis (DSA) need to have a USQD prepared. However, as discussed in the Screening Section, some procedure changes may not require a USQD. Changes to procedures include both revising an existing procedure and creating a new procedure.

The identification of procedures may be explicit or implicit in the facility's DSA. If the procedure is implied directly by the nature of a topic in the SB (including the TSRs), that change should be considered to be to a procedure described in the DSA and a USQD performed. Such implicitly described procedures include: (1) the procedures that implement a Safety Management Program (SMP) described in the SB; (2) procedures for implementing a SAC; and (3) operating, testing, surveillance, and maintenance procedures for safety equipment when that equipment is identified in the DSA.

Procedures are not limited to those items specifically identified as procedure types (e.g., operating, chemistry, system, test, surveillance, and emergency plan) but could include anything described in the DSA that defines or describes activities or controls over the conduct of work or actions taken. Changes to these activities or controls qualify as changes to procedures as described in the DSA, and therefore must be evaluated as a potential USQ.

6.5 TESTS OR EXPERIMENTS NOT DESCRIBED IN THE EXISTING DOCUMENTED SAFETY ANALYSES <830.203 (d) (3)>.

a. Lines of Inquiry – Does the USQ procedure require that:

1. Tests and experiments not described in the existing DSA be evaluated by USQ determinations?

2. Any particular tests may be excluded from performing a USQD?

b. Discussion:

Tests and experiments should be broadly interpreted to include new activities or operations. For preoperational tests, surveillance tests, functional tests, and startup tests that are performed regularly to approved procedures, USQDs are not required every time a test is performed. However, one-of-a-kind tests used to measure effectiveness of new techniques or a new system configuration that might affect safety SSCs or SACs will require an USQD prior to being conducted. Post modification testing should be considered and included in the USQD for any modification made as a result of an experiment.

6.6 DISCOVERY OF POTENTIAL INADEQUACIES IN THE EXISTING SAFETY ANALYSES <830.203 (d) (4)>.

a. Lines of Inquiry – Does the USQ procedure require that:

1. PISA because the analysis potentially may not be bounding or may be otherwise inadequate be evaluated by USQ determinations?

2. The DOE required four (4) actions are taken?

b. Discussion:

Written USQ determinations are required when a contractor identifies a PISA that supports the DOE approved SB which indicates the safety analysis is not bounding. The intent is to ensure that the operations are conducted in a safe manner that is consistent with the SB. The DSA may be inadequate for any number of reasons. In general, it is possible for a potentially inadequate analysis to arise from three entry conditions: (1) a discrepant as-found condition, (2) an operational event or incident, or (3) new information, including discovery or an error, sometimes from an external source.

Because an inadequacy as specified above has the potential to call into question information relied on for authorization of operations, DOE requires the contractor to <830.203 (g)>:

1. Take appropriate action to place or maintain the facility in a safe condition;

2. Expeditiously notify DOE upon discovery of the information;

3. Perform a USQ determination and notify DOE promptly of the results; and

4. Complete an evaluation of the safety of the situation and submit it to the DOE prior to removing any operational restrictions implemented to compensate for the analytical discrepancy.

If a USQ is determined to be present, the safety evaluation will require not only DOE's review but also its approval of resulting changes, before any operational restrictions are removed.

6.7 SCREENING <DOE G 424.1-1A, 3.2>.

a. Lines of Inquiry – NONE.

b. Discussion:

The purpose of USQ screening is to ascertain if it is necessary to expend the valuable time and resources necessary to perform a USQD. The USQ screening is intended to be simple Go/No-Go decision-making step, without evaluative consideration. DOE encourages the use of screening to limit the number of matters for which USQDs must be performed, provided the reasons for exclusion are documented and well supported.

Candidate items for screening include:

- Changes that involve a change to a requirement in the TSRs, or the addition of a new TSR requirement. (TSR changes must be submitted to DOE for review and approval anyway.)
- The installation of an item that is an exact replacement (i.e., same manufacturer, same model number, etc.)
- The installation of an item that is on the facility "Approved Equivalent Parts" list, for which a facility engineer has evaluated and concluded that the replacement item meets all the requirements pertinent to the specific application at the facility, including the service conditions.
- Changes for which common commercial practices would suffice, and a formal nuclear-grade change control process is not warranted (for example, changing fixtures for fluorescent lighting in an office area of the facility).
- Changes for which management has already decided will be submitted to DOE for safety review and approval.
- Changes to documents that are purely editorial and make no technical change.

Another manner in which screening criteria may be applied is through categorical exclusions (for example, different procedure types). For the purpose of illustration, certain administrative procedures may be considered. Some administrative procedures would not individually or collectively affect the facility or its operation as described or themselves be described in the DSA. Therefore, there does not exist the possibility that changes to these procedures would explicitly or implicitly increase the probability or consequence of accidents or malfunctions or reduce the margin of safety.

For these procedures, changes can be categorically screened out. However, whenever screening criteria are applied in this manner, a submittal to DOE should be made, including an evaluation of why a categorical exclusion is acceptable. Such categorical exclusions require DOE approval.

Another screening consideration is the possibility that the matter being considered is fully covered by a previous USQD, even when location differences are considered.

6.8 UNREVIEWED SAFETY QUESTION DETERMINATIONS <DOE G 424.1-1A, 3.3>.

a. Lines of Inquiry – Does the USQ procedure discuss:

1. Details on how to perform a USQ determination including the seven questions?

2. The expected documentation requirements for the USQD? (i.e., evaluation of hazards (nuclear and non nuclear) affecting public, worker, and environment).

3. Reporting requirements?

b. Discussion:

Contractors are expected to provide detailed guidance and instructions on how to perform a USQ determination. A USQ determination is that record required by Section 830.203 to document the review of a "change" or a situation where there is reason to believe that the facility's existing safety analysis may be in error or otherwise inadequate. It records the scope of the determination and the logic for determining whether or not a USQ exists.

For the purpose of USQ procedures and performing USQDs, answers to the following seven questions should be thoroughly documented:

(1) Could the proposed change increase the probability of occurrence of an accident previously evaluated in the facility's existing safety analyses?

(2) Could the proposed change increase the consequences (to workers or the public) of an accident previously evaluated in the facility's existing safety analyses?

(3) Could the proposed change increase the probability of occurrence of a malfunction of equipment important to safety previously described in the facility's existing safety analyses?

(4) Could the proposed change increase the consequences of a malfunction of equipment important to safety described in the facility's existing safety analyses?

(5) Could the proposed change create the possibility of an accident of a different type than any previously evaluated in the facility's existing safety analyses?

(6) Could the proposed change create the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the facility's existing safety analyses?

(7) Does the proposed change reduce the margin of safety?

The USQ procedures should require that a defensible explanation be documented for the answers to each of the USQ criteria. The explanation is to capture the technical basis for each of the answers. It is inappropriate to set a numerical margin for increases in the probability or consequences within which a positive USQD would not be triggered.

If additional protective measures (either administrative or hardware-related) are warranted during an postulated accident situation to ensure adequate protection of the public or to provide worker safety, the USQD should conclude that the USQD is positive, on the basis that either an increase in probability or an increase in consequences of an accident has occurred.

Documentation requirements should be discussed in the implementing procedures. They should identify the level of detail necessary to document performance of the USQD and conclusions reached and include a list of references relied upon to reach this conclusion. This documentation should be complete in the sense that a qualified independent reviewer could draw the same conclusion.

The contractor should follow applicable reporting requirements as outlined in DOE O 231.1A, Change 1, ENVIRONMENT, SAFETY, AND HEALTH REPORTING, dated June 3, 2004.

The contractor program should recognize that DOE can make a declaration that a USQ exists as part of its oversight responsibility of the USQ process.

6.9 DOCUMENTATION AND RECORD RETENTION <DOE G 424.1-1A, 3.4>.

a. Lines of Inquiry – Does the USQ Procedure require that:

1. USQ records be retained for at least the full operational lifetime of the facility and turned over to any new contractor?

2. An annual summary update of USQDs be submitted to DOE?

b. Discussion:

The contractor shall retain records of USQ actions taken pursuant to 830.203 for at least the full operational lifetime of the facility (i.e., until the facility is turned over to the decontamination and decommissioning phase). In the event that there is a change in the contractor operating the facility, the outgoing contractor shall turn over all USQ records to the incoming contractor. At the end of this life cycle phase, the contractor should consider retaining the USQ records for the next phase of the facility life cycle.

All contractors responsible for a nuclear facility are required annually to submit to DOE a summary description of all USQDs performed. The annual report does not include items that were screened out. This report should be submitted on a schedule commensurate with annual update of the DSA.

6.10 TRAINING AND QUALIFICATIONS <DOE G 424.1-1A, 3.5>.

a. Lines of Inquiry – Does the USQ procedure outline:

1. Training and qualification requirements for personnel who prepare, review, and approve USQ documents?

2. Requirement for maintaining list of qualified individuals?

b. Discussion:

Requirements for training and qualification includes required educational background, years and/or types of work experience, knowledge of the facility, understanding of DOE requirements related to the facility SB (including the USQ process), and familiarity with the facility-specific SB.

All personnel responsible for preparing, reviewing, or approving USQ documents should receive training on the application of Section 830.203, including any facility-specific procedures. A list of qualified individuals for each facility should be developed and maintained. The recommended interval for retraining is every two years.

The contractor should maintain a current list of those personnel who are qualified to perform the USQ process.

6.11 SUBMITTAL OF USQ PACKAGE TO DOE <DOE G 424.1-1A, APPENDIX B.6>.

a. Lines of Inquiry – NONE.

b. Discussion:

A formalized procedure that defines the content of the submittal to DOE requesting an amendment to the facility SB should supplement the USQ process (regarding positive USQDs.) An adequate package must contain more than just the documentation of the seven questions in the USQD. Such a procedure might outline the expected content as including items such as:

(1) An introductory summary of the purpose of the package and its contents;
(2) A description of the situation that generated the need for action;
(3) Alternative actions considered, including JCOs;
(4) A description of the selected action;
(5) Engineering technical considerations;
(6) Safety implications of the action, including the results of the USQ process when applicable;
(7) Programmatic implications;
(8) Revised SB documents;
(9) Schedule considerations; and
(10) Basis upon which the contractor believes that DOE should approve the action.

6.12 IMPLEMENTATION PLAN, IF NEEDED.

a. Lines of Inquiry – NONE.

b. Discussion:

An Implementation Plan (IP) should be developed by the contractor if the USQ process does not meet the requirements of the Section 830.203. The use of DOE G 424.1-1A is suggested to assist the contractors in ensuring compliance with the regulations. Deficient program elements should be listed in the IP or comment Sections on the checksheet. These items should be discussed with the contractor for incorporation into the USQ process.

7.0 COMMENT/ISSUE RESOLUTION.

All comments/issues related to the contractor USQ procedure shall be documented and formally submitted to the responsible line AM for transmittal to the contractor through the COR. Any items that have been checked "NO" on the checksheet should be explained or resolved. A sample Comment Resolution form can be found in Appendix B (Comment Resolution Form).

8.0 SAFETY EVALUATION REPORT <830.203 (c)>.

ORO approval of the contractor USQ Procedure must be issued via a SER in accordance with 10 CFR 830.203.(c) and ORO O 420, Chapter XIII, Change 3, SAFETY BASIS DOCUMENTS REVIEW SYSTEM. The reviewer(s) shall prepare the SER containing the basis for the approval in accordance with ORO O 420, Chapter XIII, Change 3, and the assigning line organization's review and approval process. Any items that have been checked "NO" on the checksheet should be explained. Concurrence and approval of the SER and corresponding USQ procedure(s) shall be obtained in accordance with ORO O 420, Chapter XIII, Change 3 and the assigning line organization's review and approval process from the approval authority. (See ORO O 250, Chapter XI, Change 2, DELEGATIONS AND AGREEMENTS)

If a revision of the contractor's approved USQ procedure is necessary, the associated SER should be revised or supplemented to document the review and basis for approval of the revised procedure.

USQ PROCEDURE REQUIREMENTS CHECKSHEET

Contractor: _____

Procedure No. and Revision: _____

The Reviewer shall verify that the above Procedure addresses each of the following requirements from Section 830.203 or *DOE G 424.1-1A (DOE G 424.1-1A requirements are non-mandatory, however, they provide an acceptable method for implementing the requirements of 10 CFR 830)***:**	**YES**	**NO**
6.1 Roles and Responsibilities defined for Program Implementation <*3.1*>		
6.2 USQ Process Integrated into Facility Change Control Process <*3.1*>		
6.3 Section on Temporary or Permanent Changes in Facility <**830.203(d)(1)**> - requires USQD when change in facility as described in the existing DSA - distinction made between maintenance activities and changes - includes Transportation activities		
6.4 Section on Temporary or Permanent Changes in Procedures <**830.203(d)(2**)> - requires USQD when change in procedure as described in the existing DSA		
6.5 Section on Tests or Experiments <**830.203(d)(3)**> - requires USQD when test or experiment is not described in the existing DSA - defines what Tests may be excluded from USQDs		
6.6 Section on Discovery of Potentially Inadequate Safety Analysis (PISA) <**830.203 (d)(4)**> - requires USQD for discovered PISA - identifies the four required actions - outlines notification, reporting, approval requirements - discusses entry conditions for PISA		
6.7 Section defining USQ Screening Process <*3.2*> - identifies items that can and cannot be screened		
6.8 Section that defines and outlines USQD process <*3.3*> - discusses applicability of process - discusses the seven questions used in a USQD - requires analysis for consequences to worker - provides explanation of acceptable documentation for USQD - defines review and approval of USQD - outlines appropriate reporting notifications		
6.9 Section on Documentation requirements and Record retention <*3.4*> - requires annual submittal of USQD summaries to DOE - requires life time retention of USQDs		
6.10 Section defining personnel training and qualification requirements <*3.5*> - requires list of qualified individuals be maintained - specifies minimum requirements for qualification		

The Reviewer shall verify that the above Procedure addresses each of the following requirements from Section 830.203 or *DOE G 424.1-1A (DOE G 424.1-1A requirements are non-mandatory, however, they provide an acceptable method for implementing the requirements of 10 CFR 830)**:***	**YES**	**NO**
6.11 Section on preparation of USQ change package for submittal to DOE <*Appendix B.6*> - outlines required contents of USQ change package including: - revised safety basis documents and JCOs - Safety Evaluations and back up information		
6.12 Implementation Plan prepared, *if not necessary mark "**N/A**"* - lists items that should be included in IP: - - -		
COMMENTS:		

Reviewer(s) Signature Date

USQ PROCEDURE COMMENT RESOLUTION

Procedure No. and Revision: _____

Reviewer: _____

Comment No.	Comment(s)	Rule Ref.	Resolution

TECHNIQUES FOR COMMENTING ON SAFETY BASIS DOCUMENTATION

1. Make comments as specific, concise, and objective as possible. Keep it simple. Tell what you suspect is in error and what needs to be done to fix it. Make your recommendations clear. A suggested resolution is most effective if it is in a form that can be simply substituted in the documents; however, avoid getting into the position of telling the author how to write the whole document.

2. Avoid comments that are questions. If you have a question, call the document author or phrase the comment such that it isn't in the form of a question (e.g., start the comment with an active verb). Questions often convey the message that you don't know the subject well enough to review it. Sometimes questions are unavoidable, but this technique should be minimized.

3. Make comments that are constructive and technical in nature. Comment on concepts, methods, and compliance.

4. Avoid simply making comments on grammatical, spelling, or editorial errors unless it changes the meaning of the text. This is not an effective use of your time. The contractor should have editors to correct such items. Alternately, make one comment: "Perform a spelling and grammar check."

5. Sarcastic or derogatory comments about the author or text are unprofessional and are not acceptable.

6. Prepare comments using comment resolution matrix (see attached) that has the following attributes:

   - Number all comments in a manner such that they are easily retrieved during discussion or resolution.

   - Identify the originator of each comment (i.e., reviewer(s), team member, or subject matter expert) using each individual's initials.

   - Attempt to separate and group your comments into essential and suggested. Essential comments can be of two types: (1) those that are safety significant that must be resolved before you will or can approve, and (2) those that are important but can be corrected later (i.e., before the next revision of the document). The latter are usually problems concerning technical details. (Safety significant comments are concerned with release of hazardous material that challenges the consequence guideline values, erroneous assumptions or conclusions in the safety analysis, omissions or errors in the safety analysis topical material, situations leading to loss of containment/confinement, or situations resulting in loss of a safety structures, systems and components.) Suggested comments are usually nontechnical concerning format or anticipated changes that are not mandatory to be resolved before you will approve the document.

   - Provide the specific point in the document where your comment is applicable, preferably in this order: Page, Chapter, Section, Paragraph, Line.

   - Clearly articulate the comment (see example in the attached matrix).

   - Provide the technical basis for generating the comment.

   - Document the resolution of the comment, when generated.

7. Return your comments in accordance with the requested dates. The reviewer(s) should be aware of any delays and the need for approval extensions. Where delays are anticipated, the appropriate line organization's point of contact shall be made aware of the situation as soon as possible.

8. Upon resolution of comments through the reviewer(s), avoid any unnecessary repeated reviews of the entire safety basis document unless the issue crosscuts the whole document.

SAFETY BASES REVIEW COMMENT/RESOLUTION MATRIX

Document Title/Number:						Date Comment(s) Sent:
Comment No.	**Originator of Comment**	**Type (Essential or Suggested)**	**Section/Page**	**Comment(s)**	**Basis for Comment**	**Resolution**
1	JAF	E	3.3.2.2/3-50	During the analyzed accident event, credit was taken for the HVAC system to mitigate the consequences of the accident, yet the HVAC is not listed as a safety system. Please clarify whether this system is a safety class or safety significant system.	DOE-STD-3009-94, Section 4.3/4.4; Appendix A.2, Evaluation Guidelines	

SAFETY EVALUATION REPORT FORMAT AND CONTENT

Guidance provided in DOE-STD-1104-96, Change Notice 3, should be used as the primary resource for developing a Safety Evaluation Report (SER). The format and content of SERs may vary depending on the type of safety basis (SB) document being reviewed and the level of hazards and facility complexity addressed by the SB document.

Listed below are SER format and content guidelines derived from DOE-STD-1104-96, Change Notice 3. Some SER Sections designated with an asterisk (*) may not be necessary for updates or revisions to SB documents. Also, the level of detail required in each Section should be commensurate with the type of document being reviewed and the complexity and hazardous nature of the facility being reviewed.

1. Title Page – This page includes the SER title, revision number, SB number and date issued, facility name and identification number, site identifier, contractor's name, and the appropriate contract number.

2. Signature Page – This page includes the signatures required by the assigning line organization's review and approval process.

3. List of Acronyms – Where required based on the complexity of the SER.

4. Revision Log – This page includes a table with the revision number and a brief explanation of the reason for the revision.

5. Table of Contents – Where required based on the complexity of the SER.

6. Executive Summary – This Section contains summary information regarding the basis for approval of the SB document. The discussion should contain a brief description of the facility mission, a summary of the major hazards, a discussion of commitments and agreements, and any conditions of approval.

7. Introduction – Provide general information that briefly describes the SB document that is being reviewed, including the official SB document title and number that was assigned by the contractor. State who submitted the SB document and its intended purpose (i.e., initial approval of Documented Safety Analysis (DSA), Unreviewed Safety Question, Justification for Continued Operations (JCO), etc.).

8. Review Process – This Section contains a discussion of the review process, including (a) key participants, (b) summation of the review effort, (c) walkdowns that were performed, and (d) a summary of discussions with the SB preparation personnel.

9. Basis for DOE Approval – Provide a list and brief discussion of the review criteria used to determine the adequacy of the SB document being reviewed (i.e., Directives, Standards, Rules, Guides, or other requirements documents). These criteria will directly support the basis for approval. Summarize the technical adequacy and completeness of the SB document as it relates to the review criteria.

10. *Base Information – This Section contains a brief synopsis of the facility and its operational process, and it should state whether enough information is provided to complete an adequate review of the DSA. Any inadequacies in this Section should be evaluated. Major inadequacies could require a DSA revision prior to approval, or minor ones could be included in the next DSA update. The information in this Section should not repeat the detailed SB information contained in the DSA.

11. *Hazard and Accident Analysis – This Section should provide the basis for approving the hazard and accident analysis. This includes a brief synopsis of the identified hazards; address defense in depth (DID), worker safety, and environmental protection; and list dominant accidents and accident consequences. This Section should reference and not repeat the detailed accident analysis presented in the DSA. Any issues resolved during the review process should be outlined in this Section.

12. *Safety Structures, Systems, and Components (SSCs) – This Section should discuss the bases for approving the designation of SSCs and Specific Administrative Controls (SACs), their associated safety function, and required Technical Safety Requirements (TSR) coverage. The logic being carried through the hazard and accident analysis to identification of the SSCs and SACs should be discussed.

13. *Derivation of the Technical Safety Requirements – This Section should discuss the bases for approving the derivation of the TSR. This includes a discussion on the logic carried through the hazard and accident analysis and safety SSC Chapters to the TSR derivation. This Section should reference and not repeat the derivation information in the DSA. If the TSR is submitted, this Section should discuss whether all of the items were appropriately captured in the TSR.

14. *Programmatic Controls – This Section should contain the bases for approving the identified programmatic controls. This includes a list of the identified programmatic controls and their significance to DID, worker safety, and/or accident scenarios, as well as identification of any inadequacies. It is not necessary to summarize the program information from each Chapter.

15. Conditions for Approval – List any conditions of approval, such as constraints on the TSR or alterations to other commitments that are imposed by the Department of Energy on the contractor. The following conditions should be addressed, where applicable:

- *Directed Changes*, if any (changes that must be made with controlled copy distribution). Exact wording and placement must be provided.

- *Future Direction* to be incorporated into future planned SB revisions and direction to perform future revisions.

- *Implementation issues* should be addressed, including concurrence/nonconcurrence with the contractor's proposed implementation date(s).

- *Expiration dates*, if any, that apply to conditions being accepted (e.g., JCOs and compensatory measures).

16. Records – This Section should include any records associated with the review process, such as meeting minutes, DSA/TSR review plan, document submittal number (draft safety bases by date), issue resolution letters, and documentation of additional commitments by the contractor.

17. Conclusion – This Section summarizes the bases for approval of the SB document. This Section should include all of the conditions for approval, including commitments made by the contractor under separate cover and items that should be included in the next update of the DSA.

18. References – List the references used to support the preparation and the conclusions of the SER.