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Department of Energy
Washington, DC 20585

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... SAFETY BOARD

JUN 0 3 2005

The Honorable A. J. Eggenberger
Acting Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW, Suite 700
Washington, D.C. 20004-2901

Dear Dr. Eggenberger:

This letter provides a status of the Office of Environmental Management (EM) actions to complete Commitment 4.4 of the Department of Energy's (DOE) Implementation Plan for Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls*. The commitment calls for the submission of a report on training completed and copies of changes to relevant training plans regarding DOE-STD-1186-2004, *Specific Administrative Controls*. On November 4, 2004, the Secretary revised the due date to May 31, 2005, to allow additional time after the issuance of the standard in August 2004. We expect all EM actions under this commitment to be met within 90 days.

EM sites and activities have completed the required initial training, except for one site. The contractor at the Richland Operations Office has initiated training and will complete the training in early June 2005. A summary of the training conducted at EM sites is enclosed. In addition, a compact disc containing the detailed training modules has been provided to your staff.

EM sites are using a variety of means to institutionalize DOE STD-1186-2004 into the various training programs as shown in the enclosure. These activities are in progress and are to be completed within 90 days.

If you have any further questions, please call me at (202) 586-7709 or Dr. Robert Goldsmith, Acting Deputy Assistant Secretary for Integrated Safety Management and Operations Oversight, at (301) 903-4954.

Sincerely,

Charles E. Anderson
Principal Deputy Assistant Secretary
for Environmental Management

Enclosure

Training for Specific Administrative Controls at EM Sites

Recommendation 2002-3 Implementation Plan Commitment 4.4 requires "completion of initial training for relevant DOE, NNSA, and contractor organization on the material developed under Commitment 4.3 and will ensure that training focus is captured in the appropriate contractor and DOE training programs."

Deliverables:
4.4.1 A report of the training completed
4.4.2 Copies of changes to relevant training plans

Current Status:

Carlsbad Field Office (CBFO)
POC: Dr. Chuan-Fu Wu
CBFO is utilizing training developed by Washington TRU Solutions for training of both the contractor and Federal staff. The site is trying to achieve some economy by building on the efforts of Washington Group International at the Savannah River Site. The initial training was given on May 13, 16, and 18, 2005. The employees trained included Federal managers, engineers, safety staff, and field representatives; and contractor managers, engineers, watch staff, and selected operations staff. The training will be institutionalized in June by revising the Waste Isolation Pilot Plant course "OPS-122, Technical Safety Requirements" to include information on Specific Administrative Controls (SAC). OPS-122 is a required course in the qualification path for operations, Waste Handling, and Radiological Control Technicians.

Idaho Operations Office (ID)
POC: Jacquie Carrozza
EM activities at this Office of Nuclear Energy, Science and Technology site have met the requirements of Commitment 4.4. Initial training was conducted on October 7, 2004 (Class #183463), for contractor safety analysis personnel and Federal staff involved in the safety basis review and approval process. On December 2, 2004, and January 20, 2005, training was conducted for Federal staff that did not attend the initial training including safety system oversight personnel, safety and health subject matter experts, DOE-ID management involved in the review and concurrence for approval of safety basis documents, and facility representatives. Training materials developed by the Office of Environment, Safety and Health (EH) were tailored to reflect local controls and lessons learned. Because of contractor transitions, not all affected contractors have been trained at this time. This training was completed in May 2005. Institutionalization of training will be accomplished in June by modifying the contractor's Qualification Standard 1107 for "Safety Analyst Training" to include the DOE STD-1186. DOE-STD-1186 has been institutionalized for the Federal staff into the DOE-ID Training Qualification Program through the Office/Facility Specific Qualification Standards.

Portsmouth/Paducah Project Office
POC: David Kozlowski
The Bechtel Jacobs Corporation, in conjunction with its operations at Oak Ridge, tailored the training materials provided by EH for local operations in March 2005. This training was developed into formal training module 29014. Two initial training sessions were given on April 4-5, 2005, to targeted Bechtel Jacobs Corporation (BJC), subcontractor, and Federal personnel. On May 11-12, additional training was provided by televideo to relevant contractor personnel. BJC is in the process of finalizing SAC updates in June to its training modules for Accident Analysis, Control Selection, Documented Safety Analysis Preparation, Facility Hazard Categorization, and Hazard Analysis Application Guide.

Livermore Support Office
Livermore will report through the National Nuclear Security Administration (NNSA) for Commitment 4.4.

Nevada Support Office
Nevada will report through NNSA for Commitment 4.4.

Oak Ridge Office
POC: Jay Mullis
EM and NNSA staffs at this Office of Science site have combined their efforts for a joint training program. Facility representatives, nuclear safety personnel, safety analysts, and lead reviewers were required to attend the training. Training sessions were run on March 11, 15, 22, and 29 and April 3 and 4. Training was developed in-house from the EH-developed training material by two of the Oak Ridge prime contractors with DOE oversight and involvement. To formally institutionalize the SAC standard, the training guide, 27035 *Controls Selection Application Guide*, has been revised and is in final review. This guide is included in the Qualification Standard relevant BJC safety related positions.

Ohio Field Office (OH)
POC: John Orrison
The OH facilities are closure sites near the end of their life with limited nuclear hazards remaining. Accordingly, training for the Federal staff and contractor safety staff was performed informally and in-house. It consisted of using the EH prepared materials applied to the limited controls of the OH sites. Since the remaining nuclear facilities are scheduled to go below Hazard Category 3 this year, SAC training is not being institutionalized.

Richland Operations Office (RL)
POC: Mark Jackson
Federal staff (safety bases analysts and engineering support) were trained in-house from the EH supplied training materials. Additional awareness training will be given to the facility representatives in the upcoming quarter. Fluor Hanford has created a formal training module (number 020212) based on the EH training material with modifications

based on local controls. The contractor at the Richland Operations Office has initiated training and will complete the training the second week of June 2005. Institutionalization will be accomplished by referencing it in the RL approved *FHI Safety Analysis and Risk Assessment Handboo*k, which is the methodology to use for SACs. Additionally, Fluor will formally modify individual's training requirements and the Training Implementation Matrix.

Office of River Protection
POC: Dana Bryson
The SAC training course was developed in-house by CH2M Hill from the EH training materials and was designated as module 350905. Forty-one individuals from the Federal and contractor staff were trained, including facility representatives, authorization basis staff, and safety staff. The training module has been added to the CH2M Hill Nuclear Safety and Licensing Engineers list of required training. The local Training Implementation Matrix has been amended through the site ITEM system.

Savannah River Operations Office (SR)
POC: Mark Smith
The SAC training course was developed by Washington Safety Management Solutions LLC as DOE training module ENG039 and Westinghouse Savannah River Company (WSRC) training module EE000448 and was given to DOE-SR Federal and WSRC contractor staff on April 21, 26, and 28 and May 5 and 12, 2005. The training was based on the EH materials with additional Savannah River Site specific information presented. Approximately 24 DOE-SR safety basis reviewers, 36 WSRC safety basis reviewers, and 32 Washington Management Solutions safety analysts were trained during this timeframe. The institutionalization of the training will be accomplished by incorporating DOE STD-1186 into the site Standards Requirements Information Documents during July.

SEPARATION

PAGE

BECHTEL JACOBS
Bechtel Jacobs Company LLC

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APR 18 2005

DOE Contract No. DE-AC05-03OR22980
Job No. 23900
ENG-05-021
April 15, 2005

Mr. William E. Murphie, Manager
Portsmouth/Paducah Project Office
U.S. Department of Energy
1017 Majestic Drive, Suite 200
Lexington, KY 40513

Dear Mr. Murphie:

DOE Contract No. DE-AC05-03OR22980: Response to Department of Energy Request for Specific Administrative Controls Training Information

References: 1) Letter from William E. Murphie, to John J Meersman, Joe Stringer, and Glenn E. VanSickle, *Defense Nuclear Facility Safety Board Recommendation 2002-3, Specific Administrative Controls and Associated DOE-STD-1186 "Specific Administrative Controls,"* dated April 4, 2005

2) Letter from Paul F. Clay, to Stephen H. McCracken, *Response to Department of Energy Request for Specific Administrative Controls Training Information*, dated April 8, 2005

3) Letter from L. Dennis Boggs, to Paul F. Clay, *Defense Nuclear Facility Safety Board Recommendation 2002-3, Specific Administrative Controls and Associated DOE-STD-1186 "Specific Administrative Controls,"* dated March 11, 2005

In response to your request of April 4, 2005 (Reference 1), Bechtel Jacobs Company LLC (BJC), Portsmouth Gaseous Diffusion Plant (PORTS), provides the following implementation plan for DOE-STD-1186 Specific Administrative Controls (SAC). This implementation plan is similar to the plan issued to DOE-ORO for all the Oak Ridge BJC operations (reference 3) in response to (reference 2).

1. October 2004 - Include pertinent SAC guidance in the revisions to the following application guides: BJC/OR-1105, *Accident Analysis Application Guide*; BJC/OR-1110, *Controls Selection Application Guide;* BJC/OR-1111, *Preparation of Documented Safety Analysis (DSA) for DOE Category 2 and 3 Nuclear Facilities;* BJC/OR-1112, *Facility Hazard Categorization/Classification and Hazard Analysis Application Guide.* **(Completed October 2004)**

2. March 2005 – Develop BJC tailored training, Module 29014, for *Specific Administrative Controls*, using the training materials developed by Department of Energy (DOE) Office of Environment, Safety and Health as guidance. **(Completed March 2005)**

3. April 2005 – Conduct two training sessions for Module 29014, SAC, and make class available to BJC, subcontractor, and DOE personnel. **(Completed April 4 & 5, 2005)**

4. April 2005 – Revise the following application guide training modules: 27029, *Accident Analysis Application Guide;* 27035, *Controls Selection Application Guide;* 27033, *Preparation of Documented Safety Analysis for DOE Category 2 and 3 Nuclear Facilities*; 26989, *Facility Hazard Categorization/Classification and Hazard Analysis Application Guide.* **(In final review)**

5. May/June 2005 – Conduct training to application guides identified in item 4.

6. June 2005 – Develop delta training to apprise previously trained personnel to application guides changes.

7. June to December 2005 – Conduct application guide delta training.

BJC has developed application guides to aid Nuclear Facility Safety personnel in developing and revising DOE compliant DSAs and Technical Safety Requirements (TSRs). Moreover, BJC has identified training to these application guides as part of the qualification requirements for both BJC and subcontractor personnel who are responsible for reviewing and approving DSA/TSRs.

BJC has incorporated DOE-STD-1186 criteria, as appropriate, within these application guides and will continue to require training to these application guides as part of qualification for the PORTS Nuclear Safety Project Lead, PORTS BJC Nuclear Criticality Safety Manager, BJC Nuclear Criticality Safety Engineer, DSA Independent Technical Reviewers, and BJC PORTS Nuclear Safety Engineers (including subcontractors supporting Portsmouth DSAs/TSRs development).

Additionally, to meet the current need for training to DOE-STD-1186 criteria, BJC has developed a unique training module (29014) to provide training on these criteria. This training occurred on April 4 & 5, 2005. There was a total of 58 BJC and subcontractor Nuclear Facility Safety personnel that attended the training. Three of these people are currently based at Portsmouth. In the future, the application Guide Delta Training discussed in the implementation plan will satisfy the training requirement for DOE-STD-1186 criteria. Application Guide Delta Training will be completed by December 31, 2005. Details of PORTS personnel positions who have received training and anticipated dates of future training are provided below.

PORTS Positions Trained to SAC (Module 29014)	**Personnel Trained (number) & Personnel to be Trained (number)**
Deployed Nuclear Facility Safety Manager/Nuclear Safety Project Lead & DSA Independent Technical Reviewer	Trained –1
PORTS Nuclear Criticality Safety Manager / Safety Analyst	To Be Trained –1
BJC Nuclear Facility Safety Engineer	Trained –1
Subcontractor Nuclear Safety Engineer and DSA Independent Technical Reviewer	Trained –1
Subcontractor NCS Engineers	To be trained –2
Subcontractor Nuclear Safety Engineers	To be trained –1
Totals	**As of 4/14/05 – 3 Trained 4 More to be Trained by 5/31/05**

Training materials for the application guide training modules were provided to DOE in 2004 for courtesy review. The training materials for module 29014, *Specific Administrative Controls*, are provided as an enclosure to this letter.

Please note that DOE STD-1186 is not included in the Baseline List of Required Compliance Documents contained in Appendix E of the contract. BJC proceeded with training after the Contracting Officer was notified and agreed to the action. In order to add the standard to the contract, BJC requests that you contact the Contracting Officer so the process described in Clause I-98 "Laws, Regulations, and DOE Directives" can be followed. A rough order of magnitude cost estimate for implementation of DOE-STD-1186 is $350,000 to $600,000. Incorporation of the standard requires extensive changes to the DSA/TSR documents, flowdown to and revision of associated BJC and subcontractor procedures, preparation of USQDs for document/procedures changes, and training of personnel to the standard and all the revised procedures and documents. A more accurate implementation cost estimate will be developed by BJC during the contract change process.

BJC PORTS will prepare SACs for any new DSA/TSRs as appropriate (no new DSA/TSRs are currently in our baseline). Incorporation of DOE STD-1186 requirements into the existing Cylinder Yard DSA/TSR and the Category 2 Nuclear Facilities DSA/TSR will be required when DOE STD-1186 is formally added to the BJC

PORTS Contract. This backfitting will be done at the next annual update of each document, subject to contract revision and DOE funding approvals.

USQ Evaluators and Facility/Operation Management will be trained on SACs when their TSRs are modified to contain SACs. The number of individuals estimated to be trained is approximately ten. The training date will be tied to the approval of the annual update of each PORTS DSA/TSR.

Please contact Ralph D'Antoni at (740) 897-4012 if you have questions or need additional information on this response.

Sincerely,

John J. Meersman
Manager of Projects

JJM:RJD:bp

Enclosure: Specific Administrative Controls Training Module

c/enc:
A. Bartlett, DOE-ORO
L. Donahue, BJC-PORTS
T. Hines, Navarro-PGDP
D. Kozlowski, DOE-PPPO
D. Perkins, DOE-PPPO
DMC – RC
File – ENG

c w/o enc:
P. Burdick, BJC-PGDP
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L. Hurst, BJC-PGDP
T. Marshall, BJC-PORTS
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J. S. West, BJC-ETTP
D. Whittaker-Sheppard, BJC-ETTP
J. S. Wilson, DOE-ORO

Specific Administrative Controls

Terminal Objective

Demonstrate an understanding of the Specific Administrative Controls (SACs) concept and how the new DOE-STD-1186-2004 meets the intent of 10 CFR Rule 830 while aligning with existing safety documentation and the current implementation process of BJC

Topics

- Understanding of terms
- Overview of the Controls Selection Process
- Introduction of to Specific Administrative Controls
- Key Elements to Formulating Specific Administrative Controls
- Introduction to the TSR
- Implementing Specific Administrative Controls
- Implementing the TSR Controls

Understanding the Terms

- Documented Safety Analysis
- Safety Class SSCs
- Safety Significant SSCs
- Specific Administrative Controls
- Defense-in-Depth

What is meant by a "Documented Safety Analysis?"

DSA

A documented analysis of the extent to which a nuclear facility can be operated safely with respect to workers, the public, and the environment, including a description of the conditions, safe boundaries, and hazard controls that provide the basis for ensuring safety.

(10 CFR Part 830.205 Subpart B)

What is meant by a "Safety Class SSCs?"

The structures, systems, or components, including portions of process systems, whose preventive or mitigative function is necessary to limit radioactive hazardous material exposure to the public, as identified by the Safety Analyses.

(10 CFR Part 830.205 Subpart B)

What is meant by a "Safety Significant SSCs?"

The structures, systems, and components which are not designated as safety class structures, systems, and components, but whose preventive or mitigative function is a major contributor to defense in depth and/or worker safety as determined from safety analyses.

(10 CFR Part 830.205 Subpart B)

What is meant by “Specific Administrative Controls?”

ACs that are intended to provide preventive and/or mitigative functions for specific potential accident scenarios, and which have safety importance equivalent to engineered controls that would be classified as Safety Class or Safety Significant if engineered controls were available and selected.

(DOE-STD-1186-2004)

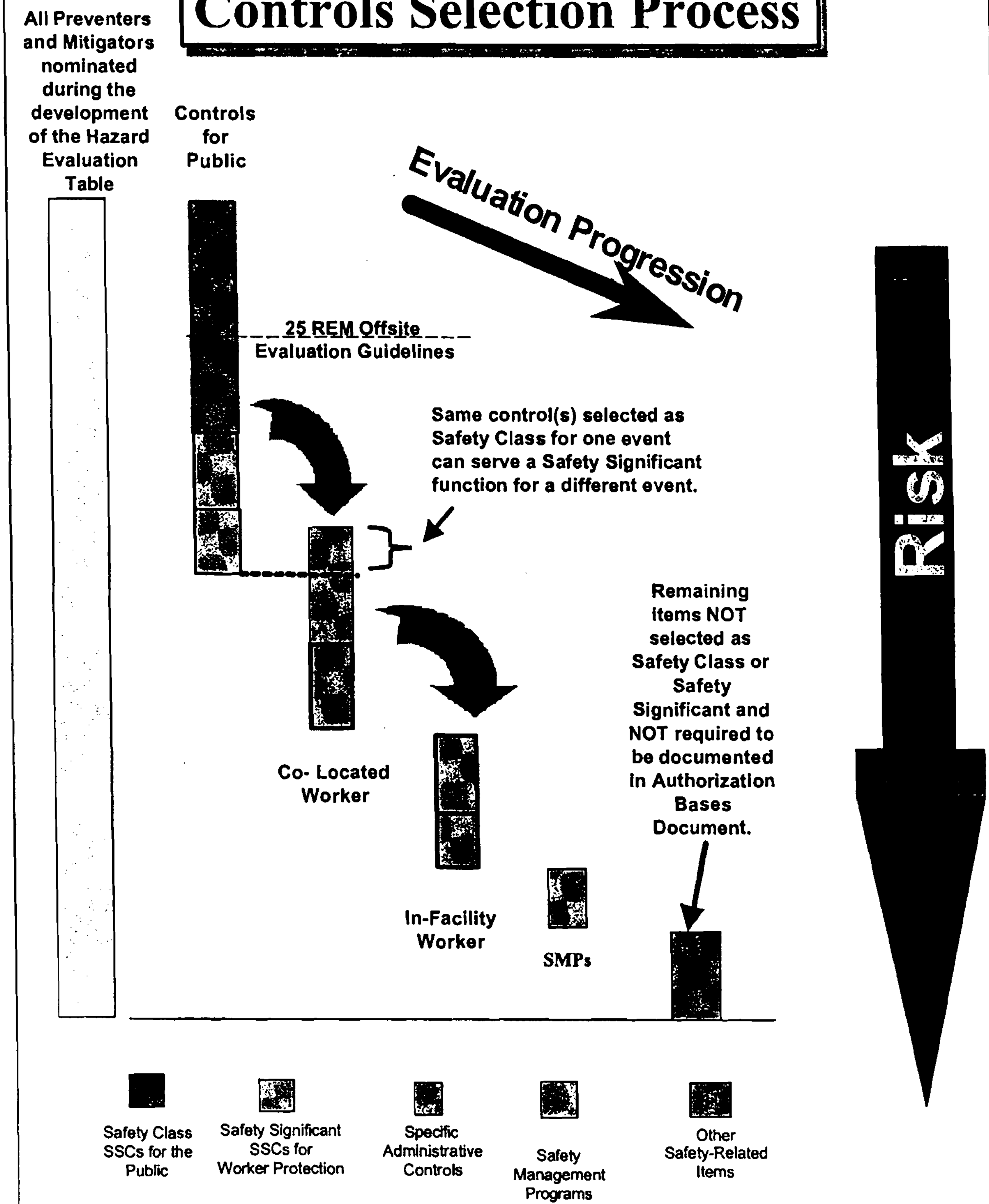
Defense-in-Depth

- It builds in layers of defense against release of hazardous materials so that no one layer by itself, no matter how good, is completely relied upon.
- To compensate for potential human and mechanical failures, defense in depth is based on several layers of protection with successive barriers to prevent the release of hazardous material

(Ref. DOE-STD-3009-94 page 7)

Overview of the Controls Selection Process

Controls Selection Process



Hierarchy of Controls Selection

When selecting controls the primary factor to be considered is effectiveness and therefore the following "hierarchy" or ranking should be followed whenever possible:

- Preventive before mitigative
- Passive features over Active features
- SSCs before Administrative Controls

Note: In TSRs LCOs are no more important than ACs

Introduction of Specific Administrative Controls

Why is this new classification of Specific Administrative Control needed?

What is a "Specific Administrative Control?"

ACs that are intended to provide preventive and/or mitigative functions for specific potential accident scenarios, and which have safety importance equivalent to engineered controls that would be classified as Safety Class or Safety Significant if engineered controls were available and selected.

What is a "Specific Administrative Control?"

Administrative Control that are:

- intended to provide preventive and/or mitigative functions for specific potential accident scenarios, and
- which have safety importance equivalent to engineered controls that would be classified as Safety Class or Safety Significant if engineered controls were available and selected.

Why are SACs Needed?"

Once it is determined that an SSC is not available and the use of an SAC is necessary DOE recognizes a need to:

- Improve the dependability of these controls, and
- Enhance their availability to perform specific safety functions when needed, commensurate with their safety importance.

New Technical Standard on SACs

- Issued on August 31, 2004 as DOE-STD-1186-2004
- Establishes DOE expectations and guidance for formulation, implementation, and maintenance of Specific Administrative Controls

Sources of Requirements Applicable to ACs

- DSA Rule (10 CFR 830.204)
- TSR Rule (10 CFR 830.205) plus Table 4 of the Rule.
- DOE O 420.1, Facility Safety
- DOE STD-1186-2004 SAC Standard, August, 2004

Sources of Guidance for ACs

- DOE G 423.1-1, *Implementation Guide For Use In Developing Technical Safety Requirements*
- DOE G 421.1-2, *Implementation Guide For Use in Developing Documented Safety Analyses To Meet Subpart B Of 10 CFR 830*
- DOE-STD-3009-94,*CN2, Preparation Guide For U.S Department Of Energy Nonreactor Nuclear Facility Documented Safety Analyses*
- DOE STD-1186-2004, *Specific Administrative Controls*
- DOE-STD-1120, *Integration of Environment, Safety, and Health into Facility Disposition Activities* (In Revision)

Key Elements to Formulating Specific Administrative Controls

Key Elements to Formulating SACs

- Adequacy of SACs to perform effectively their required safety functions shall be documented in the DSA
- SACs shall be formulated so that they can perform their safety functions when called upon and under a quality assurance program that satisfies 10 CFR 830, Subpart A

Key Elements to Formulating SACs
(continued)

- Classification of Administrative Controls as SACs shall use the same criteria as used for Safety SSCs in STD-3009
- SACs shall be configured with appropriate safety margins to support assurance of safety functions
- Appropriate human factors engineering should be integrated with the formulation of SACs

Application of ACs and SACs

Most ACs in the TSRs are designed to provide broad programmatic support for safety management programs

- These ACs are known as programmatic ACs
- ACs that provide preventative or mitigative functions meeting the criteria for classification of SAC, are classified as SACs

Identifying SACs

Other factors that may be useful to designate an AC, identified as a control in a hazard analysis, as an SAC include:

- The AC is the basis for validity of the hazard or accident analyses (e.g., a hazardous material inventory, such as combustible materials or Material-at-Risk (MAR) limit)
- ACs provide the main mechanisms for hazard control (e.g., Safety SSCs are degraded, out of service, too costly to implement, or are impractical for a limited-life facility)

Formulating SACs

- Designation of an SAC as the primary line of defense (i.e., control) should be avoided whenever possible
- If an SAC is the primary line of defense for protection of the public, additional controls may be needed to ensure that failure of single control does not result in a high consequence accident.

DSA SAC Requirements

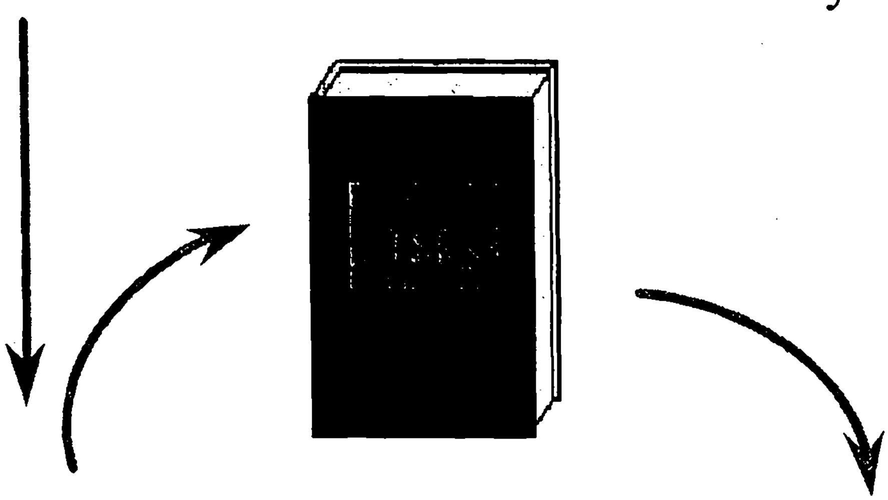
- The DSA should provide information (generally chapter 5) to support the derivation of hazard controls described in the TSR document
- Content is the linking document between the DSA hazard analysis that results in the designation of SACs and their required safety functions and attributes, and the TSR document.
- TSR and SAC procedure writers will refer to the DSA through this chapter to identify the accident scenarios that generated the need for the SAC (in Chapter 3), and information on its safety function and required attributes
- Chapter 5 should provide a summary description of this information and references to the supporting information in Chapters 3 and 4

Introduction of Technical Safety Requirements

Overall Role of the TSR

INTEGRATION
of Required
Hardware and
Programs to Ensure
Safe Operation

FOCUS
Management
Operations and
Oversight Personnel
on Important
Safety Elements



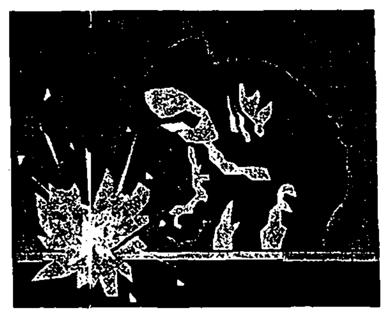
Hazards
and
Safety
Analysis

Safely
Operated
Facility

Pathways to TSRs

- Public Safety

- Worker Safety



TSRs For Public Safety

Safety Class SSCs and non-equipment controls, needed to provide the safety function to prevent or mitigate *radiological* **offsite** consequences that will ***challenge*** the **offsite** numerical *radiological* Evaluation Guidelines (EGs)

TSRs For Worker Safety

- Would come from the hazard evaluation process.
- Might result in LCOs that would protect the required **Safety Significant** function
- Most procedures that provide a **Safety Significant** function will be protected in TSRs as an Administrative Control
- Standard Industrial Hazards do **NOT** require TSR protection

10 CFR Part 830.205
Technical Safety Requirements

The 10 CFR Part 830.205 provides for the three types of possible limits to be included as TSRs:

- Safety Limits (SLs)
- Limiting Control Settings (LCSs)
- Limiting Conditions for Operations (LCOs)

Safety Limits

Limits on **process variables** associated with those safety class **physical barriers**, generally passive, that are necessary for the intended facility function and **required to guard against the uncontrolled release** of radioactive materials.

(10 CFR Part 830.205 Subpart B)

Limiting Control Settings

Setting on safety systems that control process variables that **prevent exceeding Safety Limits**

(10 CFR Part 830.205 Subpart B)

Limiting Conditions for Operations

The limits that represent the lowest functional capability or performance level of safety structures, systems, and components required for safe operations

(10 CFR Part 830.205 Subpart B)

Purpose of the Administrative Controls

The provisions relating to organization and management, procedures, record keeping, assessment, and reporting necessary to ensure safe operation of a facility.

(10 CFR Part 830.205 Subpart B)

Specific Administrative Controls

ACs that are intended to provide preventive and/or mitigative functions for specific potential accident scenarios, and which have safety importance equivalent to engineered controls that would be classified as Safety Class or Safety Significant if engineered controls were available and selected.

(DOE-STD-1186-2004)

Design Features

The design features of a nuclear facility specified in the Technical Safety Requirements that, if altered or modified, would have a significant effect on safe operation.

Implementing Specific Administrative Controls

Methods of Incorporating Specific ACs in TSRs

- Specific AC formatted as an LCO
- Specific AC as a Specific Directive Action AC

Two forms of SACs as TSRs

A Specific "Directive Action" AC

- A statement of an AC requirement in the AC section of the TSRs that prescribes a specific action to be performed in response to an observed facility condition

LCO

- This format should be used when the SAC is well defined, clear corrective actions are available, and conditions supporting the SAC can be easily surveilled

LCO Format

3/4 6.2 STACK EXHAUST SYSTEM

LCO: The Two HEPA Filter Banks shall be OPERABLE with:

- One on-line during all applicable MODES
- One in stand--by during all applicable MODES

MODE
Applicability: OPERATION, TRANSFER and STANDBY

PROCESS AREA
APPLICABILITY: Production Lines I and II

ACTIONS

CONDITION	ACTION	COMPLETION TIME
A. One HEPA filter is inoperable	A.1 Return effected HEPA to OPERABLE status	7 Days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENTS	FREQUENCY
SR 4.6.2.1 Verify that HEPA Filters are OPERABLE	MONTHLY

(Section 3/4 of the TSR document)

Role of the Bases

- To provide clear documentation of why the specific Operating Limits, associated actions and SRs were required by facility's Safety Analysis

- Provide detailed information clearly presenting all attributes for determining OPERABILITY of the specific SSC being discussed

Specific ACs formatted as an LCO

- Specific ACs implemented using the LCO when:
  - The SAC is well defined
  - clear corrective actions are available, and
  - conditions supporting the Specific AC can be easily surveilled.

Specific ACs formatted as an LCO (cont)

- Specific ACs implemented using the LCO format must meet the requirements for LCO listed in DOE-G 423.1-1, including:
  - Action Statements
  - Operability
  - Surveillance Requirements
  - Bases

Advantages of Specific ACs Written in the LCO format

- Elevates the importance of the controls from an operations standpoint
- Improve the dependability of the control through routine verification of control operability through LCO surveillance requirements
- Provides increased flexibility through the use of action statements

Specific ACs formatted as Specific Directive Action AC

Used when:

- it is essential that the Specific AC be performed when called upon every time and without any delay (e.g., hoisting limits for nuclear explosives

  or

- when definitive program requirements for specific activities can be stated

Limitations of SACs as Specific Directive Action ACs

A Violation of a Specific Directive Action AC is an immediate TSR violation.

Material at Risk (MAR) Considerations

- MAR assumption violations place the facility in a formally unanalyzed space for which consequences would be unknown and potentially unbounded.
- Not normally possible to control MAR with an active or passive Structure, System, or Component (SSC). Under normal circumstances MAR cannot be controlled through a Design Feature (DF) or SSC based LCO.
- Use of an LCO may be warranted when a defensible estimate can be made of how much of a MAR exceedance can occur.

Material at Risk (MAR) Considerations (cont)

- It may be possible to make an estimate of the risk involved in exceeding the analyzed MAR for some time interval to support LCO action times as well as associated surveillance frequencies.
- If no estimate can be made of potential MAR exceedance to support action times and surveillance frequencies, or if the LCO is too complex and unwieldy, it would be appropriate to use a TSR Section 5 AC.

Criteria for the Selection of Specific ACs

- The control is explicitly identified in the hazard analysis as a control needed to prevent or mitigate an accident scenario, and
- The control has a safety function that would be safety significant or safety class if the function were provided by an SSC, or
- The control is required to complete the safety function of a safety class or safety significant SSC

NOTE :

DOE suggests creating a list of the ACs classified as Specific ACs to provide documentation of ACs selected as Specific ACs.

Selection of Specific ACs is similar to selection of SC and SS SSCs:

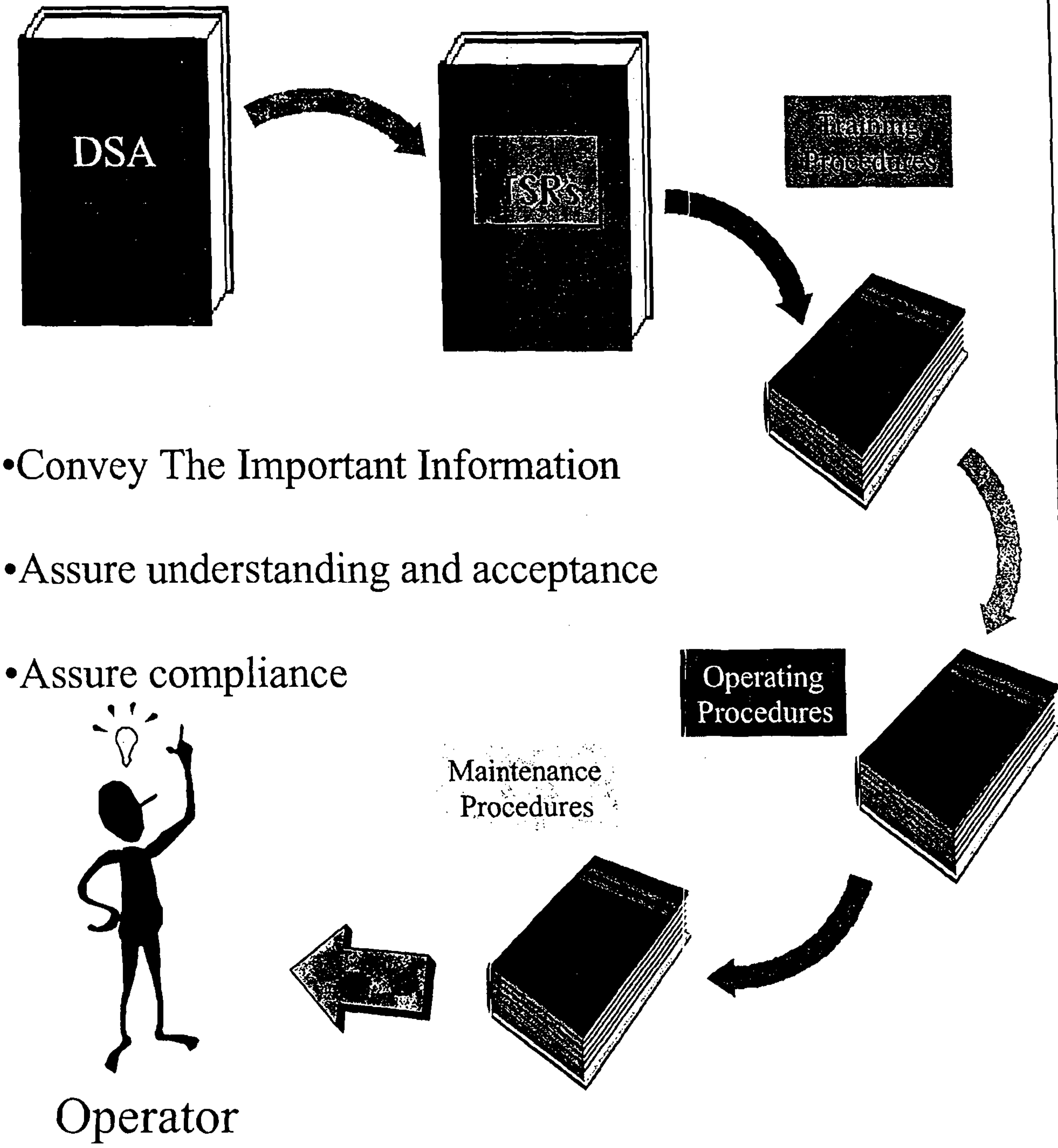
- ACs performing safety functions equivalent to SC SSCs must be Specific ACs
- ACs that provide important safety functions for defense in depth or worker safety have the same subjective criteria that are applied to SS SSCs. Not all ***specific*** AC actions need rise to the level of Specific ACs.
- Lower level ACs may have the same format as Specific ACs in TSR documents.
- A list of Specific ACs should be prepared in order to distinguish them

Identifying Violations of Specific ACs

Specific AC violations are treated like other TSR violations and have immediate notification requirements and follow-up investigation and reporting requirements. However, a full (root cause) investigation is only required for SL violations or recurring SAC violations

Implementing of TSR Controls

Goals of an Effective Implementation Program



- Convey The Important Information
- Assure understanding and acceptance
- Assure compliance

SAC Verification

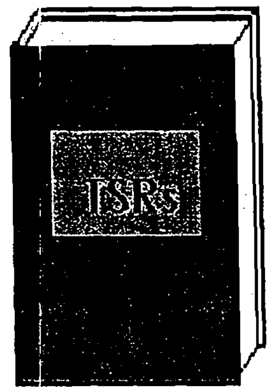
SACs must be verified to perform their intended function

- Prior to operations and periodically
- Dry runs, procedure walk-downs, table-top exercises, and drills

Periodic re-verification

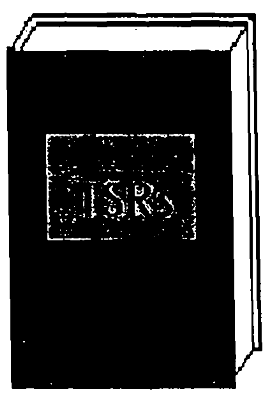
- For SACs implemented as LCO's, through Surveillances
- For SACs implemented as TSR Admin Controls, through facility operations and maintenance procedures

Summary



Be Specific

Adequate but not Excessive



Remove ALL Ambiguity

Operator Involvement

SEPARATION

PAGE

Oak Ridge

Workflow
Own Inbox
Other's Inbox
Own Preferences
Other's Preferences

Materials Mgt.
Acquisition Center
Display Purchase Reqs
Display Purchasing Docs
Display Vendors
Display Reservations

Accounting
Open Cost Center
Close Cost Center
Display Cost Centers
Adjust/Transfer Costs
Display Invoice

Human Resources
Search
Org Structure
Training Catalog
Qualification Catalog
Org Roles

Descriptions for D 50370225 DOE STD SAC: DOE-STD-1186, Specific Admin ControlsCLA

General description

This specific Administrative Controls (ACs) course is structured around DOE-STD-1186, Specific ACs. It provides training on Specific Administrative Controls (ACs) to contractor and DOE staff who support preparation/review of facility nuclear safety basis documentation. Participants will develop an understanding of the Technical Standard on Specific ACs, including identification, implementation, maintenance, and evaluation of specific ACs.

Section 1
- Background on Administrative Controls
- Overview of Specific ACs
- New DOE Technical Standard on Specific ACs
- Relationship of the New Standard to 10 CFR 830 and Supporting DOE Directives
- Sources of Requirements and Guidance Applicable to ACs
- DOEs Expectations for Specific ACs
- DOEs Approach to Formulating Specific ACs
- Derivation of Hazard Controls in the DSA
- Application of ACs and Specific ACs

Section 2:
- Identifying Specific ACs During Development of the Documented Safety Analysis
- Formulating Specific ACs
- DSA Requirements for Specific ACs
- Validation of Specific ACs
- Verification of Specific ACs
- Implementing and Maintaining Specific ACs

Section 3:
- Treatment of Safety Controls Covered by Safety Management Programs
- Implementing Specific ACs as LCOs
- Implementing Specific ACs as Specific Directive Action ACs
- MAR Limits as ACs
- Modifications to the TSRs to Support Specific ACs

Terminal Objective

Upon completion, the student will understand and be able to apply the requirements for identifying, implementing, and maintaining Specific Administrative Controls.

Enabling Objectives

Section 1:
• Explain why a new classification of administrative control is needed to ensure that the safety bases for DOE nuclear facilities is adequately established and maintained.
• Define the term Specific AC (SAC)
• Explain the relationship of DOE-STD-1186 to 10 CFR 830, DOE-STD-3009, and the other DSA safe harbors identified in 10 CFR 830.
• Discuss DOE's expectations and approach for using SACs as part of the ensemble of hazard controls.

Section 2:
• State the criteria used to identify an administrative control as a Specific AC
• State the specific requirements or documentation of SACs in the DSA.
• State the nuclear safety requirements for design of nuclear facilities as described in DOE O 420.1, and relate these requirements to formulation and implementation of SACs.
• Relate the concept of "Safety Margin" to the formulation of SACs
• Describe the following concepts as they relate to development of SACs:
- Redundancy
- Independency
- Diversity
• Explain the process for verifying and validating the effectiveness of SACs, both prior to and after implementation of SACs
• Explain how SACs are implemented and maintained.

Section 3:
• Identify the two methods used to implement SACs in the TSRs, and explain when each should be used.
• Identify the DOE Directives that should be used for guidance when developing LCOs or Directive Action ACs to implement SACs.
• Compare and contrast the benefits of LCOs vs. Specific Directive Action ACs for implementation of SACs
• Discuss the specific limitations associated with establishing SACs for facility Material at Rish (MAR) limits
• Identify the sections of the TSRs that are affected based on implementing SACs through the TSRs.

Target Audience
Applies to employees and subcontractors involved in the preparation or review of Safety Analysis documents or for Category 2 and 3 Nuclear Facilities personnel as follows:

1. Manufacturing and Quality Assurance Operations Managers, Shift

Managers, and Shift Technical Advisors
2. Engineering Organization / Departments as follows:
- Safety Analysis Engineering (all technical personnel)
- Category 2 Nuclear Facilities Engineering (all technical personnel)
- Cat 3/Non/Nuclear Facilities Engineering (all technical personnel in departments shown below) -
- Cat 3 Design Engineering
- Cat 3 System Engineering
- Process and Product Engineering (all technical personnel in departments shown below)
- Surveillance and Assembly Process Engineering
- EU Metalworking Process Engineering
- EU Chemical Process Engineering
- Procedure Writers
- Nuclear Project and Design Engineering
- Fire Protection Design

Mandate
DOE-STD-1186-2004

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Don Grandage, 35808 (574-7715)

SEPARATION

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SPECIFIC ADMINISTRATIVE CONTROLS

Introduction

Course Objective

Upon completion, the student will understand and be able to apply the requirements for formulating, implementing, maintaining, and evaluating Specific Administrative Controls.

Module 1 Enabling Objectives

- Explain why a new classification of administrative control is needed to ensure that the safety bases for DOE nuclear facilities is adequately established and maintained.
- Define the term Specific AC (SAC).
- Explain the relationship of DOE-STD-1186 to 10 CFR 830, DOE-STD-3009, and the other DSA safe harbors identified in 10 CFR 830.
- Discuss DOE's expectations and approach for using SACs as part of the ensemble of hazard controls.

Background on Administrative Controls

- DOE-STD-3009-94 addresses derivation of ACs with major significance to defense in depth, or worker safety
  - Primarily related to safety management programs
  - Not specific accident risk reduction
- DOE G 423.1-1 recognizes that ACs may be applied for risk reduction of individual accident scenarios
  - ACs should be a direct result of the DSA, but they may also result from institutional requirements
  - Engineered SSCs should be used whenever possible rather than an AC
  - ACs more appropriate as defense in depth
  - Appears to recognize ACs may be relied on for specific accidents

What are SACs?

- Administrative Controls that are:
  - selected to provide preventive and/or mitigative functions for specific potential accident scenarios, and
  - which have safety importance equivalent to engineered controls that would be classified as Safety Class (SC) or Safety Significant (SS) if the engineered controls were available and selected.

New Technical Standard on SACs

- Issued on August 31, 2004 as DOE-STD-1186-2004
- Establishes DOE expectations and guidance for formulation, implementation, and maintenance of Specific Administrative Controls

Relationship of DOE-STD-1186 to 10 CFR 830, Nuclear Safety Management

- Should be used to comply with all DOE methods for DSAs and their associated TSRs for compliance with 10 CFR 830, when formulating and implementing SACs
- Replaces guidance contained in Nuclear Safety Technical Position 2003-1, *Use of Administrative Controls for Specific Safety Functions*
- The Standard provides guidance, but does not present requirements at this time.

Sources of Requirements Applicable to ACs

- DSA Rule (830.204)
- TSR Rule (830.205) plus Table 4 of the Rule.
- QA Criteria (830.122)
- DOE O 420.1, Facility Safety

As Safe Harbors

- DOE-STD-3009-94,*CN2, Preparation Guide For U.S Department Of Energy Nonreactor Nuclear Facility Documented Safety Analyses*
- DOE-STD-1120, *Integration of Environment, Safety, and Health into Facility Disposition Activities* (In Revision)

Sources of Guidance for ACs

- DOE G 423.1-1, *Implementation Guide For Use In Developing Technical Safety Requirements*
- DOE G 421.1-2, *Implementation Guide For Use in Developing Documented Safety Analyses To Meet Subpart B Of 10 CFR 830*
- DOE STD-1186-2004, *Specific Administrative Controls*

DOE's Approach to Formulating SACs

- Parallels existing guidance for safety SSCs.
- Based on guidance for nuclear safety design criteria found in DOE O 420.1A, Facility Safety, Section 4.1
- Guidance for Safety SSCs has been adapted to SACs

DOE's Approach to Formulating SACs
(Continued)

- Key Elements:
  - Safety analyses shall establish the identification and functions of SACs and the significance to safety of the functions of the SAC
  - The ensemble of safety controls including SACs, where designated, shall be designed and configured to provide multiple layers of protection to prevent or mitigate the unintended release of radioactive materials

DOE's Approach to Formulating SACs
(*Key Elements* continued)

- Defense-in-depth, as applied to the formulation of SACs shall include conservative "design" margins
- Engineering evaluations, trade-offs, and experience shall be used to develop practical SACs that achieve the functional safety objectives
- Adequacy of SACs to perform effectively their required safety functions shall be documented in the DSA
- SACs shall be formulated so that they can perform their safety functions when called upon and under a quality assurance program that satisfies 10 CFR 830, Subpart A

DOE's Approach to Formulating SACs
(*Key Elements* continued)

- Classification of Administrative Controls as SACs shall use the same criteria as used for Safety SSCs in STD-3009
- SACs shall be configured with appropriate safety margins to support assurance of safety functions
- Appropriate human factors engineering should be integrated with the formulation of SACs
- In some cases, SACs rely on supporting SSCs to perform their intended safety function. These SSCs should meet performance requirements consistent with their safety importance

Derivation of Hazard Controls in the DSA

- SACs may be acceptable for ensuring safe operation
  - They must be evaluated carefully when choosing safety measures for long-term hazardous activities
- Hazard controls should be identified and graded on a case-by-case basis according to the guidance in DOE G 421.1-2, DOE STD-3009, and DOE-STD-1186
- The DSA may identify specific controls under a safety management program (e.g., hazardous material inventory limits) that are required for safety.
  - These controls shall be designated as SACs

Application of ACs and SACs

- Most ACs in the TSRs are designed to provide broad programmatic support for safety management programs
  - These ACs are known as programmatic ACs
  - ACs that provide specific or mitigative functions meeting the criteria for classification of SAC, are classified as SACs

Identifying, Formulating, Implementing, and Maintaining Specific ACs

Module 2 Terminal Objective

Explain how SACs are identified, formulated, implemented, and maintained.

Module 2 Enabling Objectives

- State the criteria used to identify an administrative control as a Specific AC.
- State the specific requirements for documentation of SACs in the DSA.
- State the nuclear safety requirements for design of nuclear facilities as described in DOE O 420.1, and relate these requirements to formulation and implementation of SACs.
- Relate the concept of "Safety Margin" to the formulation of SACs

Module 2 Enabling Objectives (Continued)

- Describe the following concepts as they relate to development of SACs:
  - Redundancy
  - Independency
  - Diversity
- Explain the process for verifying and validating the effectiveness of SACs, both prior to and after implementation of SACs.
- Explain how SACs are implemented and maintained.

Identifying SACs During Development of the Documented Safety Analysis

- If an administrative control:
  - is identified in the DSA as a control needed to prevent or mitigate an accident scenario, and
  - has a safety function that would be safety significant or safety class if the function were provided by an SSC, then the AC shall be designated as an SAC.

Identifying Administrative Controls (continued)

Other factors that may be useful to designate an AC, identified as a control in a hazard analysis, as an SAC include:

- The AC is the basis for validity of the hazard or accident analyses (e.g., a hazardous material inventory, such as combustible materials or Material-at-Risk (MAR) limit)
- ACs provide the main mechanisms for hazard control (e.g., Safety SSCs are degraded, out of service, too costly to implement, or are impractical for a limited-life facility)

Formulating SACs

"Nuclear facilities shall be designed with the objective of providing multiple layers of protection to prevent or mitigate the unintended release of radioactive materials to the environment. Defense in depth shall include: ... the provision of multiple means to ensure critical safety functions (those basic safety functions needed to control the processes, maintain them in a safe state, and to confine and mitigate radioactivity associated with the potential for accidents with significant public radiological impact)... ".

DOE O 420.1A

These principles also apply to the formulation, development, and implementation of the ensemble of hazard controls, including SACs.

Formulating SACs *(Continued)*

<u>Redundancy</u>, <u>independence</u>, and <u>diversity</u> of hazard controls are important to ensuring that exposure to a high consequence accident does not come about due to the failure of a single barrier.

- <u>Redundant</u>: Redundancy refers to a second control to provide the same safety function (as distinguished from diverse controls)
- <u>Independent</u>: Controls should be independent of the process being controlled, and to the extent practicable from other controls that have been credited
- <u>Diverse</u>: Diversity refers to separate controls of a dissimilar nature (as distinguished from merely redundant controls)
- Additional controls may be needed to ensure that failure of single control does not result in a high consequence accident

If an SAC is the primary line of defense for protection of the public, these principles should be applied to the SAC

Formulating SACs *(Continued)*

- DOE O 420.1A, Section 4.1.1.2 also requires that:
  - "Safety SSCs identified in accordance with this section shall, commensurate with the importance of the safety functions performed, be designed:
    - (1) so that they can perform their safety functions when called upon to operate, and
    - (2) under a quality assurance program that satisfies 10 CFR 830.120."
- These criteria also apply to SACs.

Formulating SACs *(Continued)*

- SACs should be formulated with an appropriate margin of safety which accounts for factors such as:
  - design parameters
  - equipment trip and alarm set points
  - instrument errors
  - time to perform tasks
  - surveillance test frequencies

DSA SAC Requirements

- Similar to Safety SSCs, the following SAC identification and documentation should be provided in the DSA.
  - Reason for designating the control as an SAC and its preventative or mitigative safety function
  - Description of how the SAC is to be implemented (i.e., important procedural features, including interfaces with sensors, etc.)
  - Pertinent aspects of the SAC that relate directly to the safety function, such as qualifications of personnel required and time available to perform associated tasks
  - An evaluation of the SAC that demonstrates its capability to perform the expected safety function

DSA SAC Requirements (Continued)

- The DSA should provide information (generally Chapter 5) to support the derivation of hazard controls described in the TSR document.
  - This information is the link between the DSA hazard analysis that results in the designation of SACs and their required safety functions and attributes, and the TSR document
  - TSR and SAC procedure writers will refer to the DSA through this chapter to identify the accident scenarios that generated the need for the SAC (in Chapter 3), and information on its safety function and required attributes
  - Chapter 5 should provide a summary description of this information and references to any supporting information in Chapters 3 and 4

SAC Validation

- If SACs require operator action, assurance should be provided that the operators can adequately perform their required tasks by analyzing the following human performance factors at a minimum:
  - Adequacy of the description of the task in facility procedures
  - Level of difficulty of the task
  - Design of the equipment and feedback, e.g. indicators, alarms, etc.
  - Time available to do the task or recover an error
  - Stress levels induced by the external environment, e.g. noise, heat, light and protective clothing worn

SAC Validation (Continued)

- Formal engineering calcs may be necessary to ensure that operators have the time and resources necessary to perform SAC tasks
- If SACs require operator action with function similar to SC SSCs, an HRA should be used to validate the dependability of the SAC

SAC Verification

- SACs must be verified to perform their intended function (IVR process)
  - Prior to operations and periodically
  - Dry runs, procedure walk-downs, table-top exercises, and drills
- Periodic re-verification
  - For SACs implemented as LCO's, through Surveillances
  - For SACs implemented as TSR Admin Controls, through facility operations and maintenance procedures

Implementing, and Maintaining SACs

- SACs are generally procedures which should include specifications for implementation such as:
  - Qualifications of involved personnel
  - Steps involved
  - Verification of identified limits
  - Frequency of verification
  - Requirements for any independent verifications
  - Interfaces with measuring equipment
  - Required accuracy of the equipment, etc.

Implementing, and Maintaining SACs (Continued)

- SACs can be addressed as TSRs in two forms:
  - LCO
    - This format should be used when the SAC is well defined, clear corrective actions are available, and conditions supporting the SAC can be easily surveilled
  - A Specific "Directive Action" AC
    - A statement of an AC requirement in the AC section of the TSRs that prescribes a specific action to be performed in response to an observed facility condition

Implementing, and Maintaining SACs (Continued)

- Configuration Management
  - Requirements of DOE O 420.1A, Facility Safety, apply to SACs
  - Assures the continuing capability of SACs to perform their function when called upon

Measures Used to Ensure the Dependability of SACs

Module 3 Terminal Objective

Apply measures used to improve the dependability of SACs to facility operations.

Module 3 Enabling Objectives

- Identify the attributes of proven value in improving human performance as related to SACs
- Explain how proper Conduct of Operations improves the dependability of SACs
- Explain how Independent Verification is incorporated into facility operation and applied to SACs
- Explain how Lockout/Tagout is incorporated into facility operation and applied to SACs

Module 3 Enabling Objectives (Continued)

- Identify the general requirements for operator training programs at nuclear facilities.
- Identify the training requirements for DOE-STD-1186
- Identify the training-related factors that should be addressed for operator/technician tasks supporting Specific ACs and explain how each should be addressed in the training program.
- Explain the requirements associated with SAC instrumentation & control and support equipment.

Module 3 Enabling Objectives (Continued)

- Identify the INPO recommendations for establishing a safety culture that improves SAC dependability

Lessons Learned on Human Actions Used as Safety Controls in Accident Scenarios

- Human actions are subject to errors of omission and commission
- Industry research has identified attributes of facility design and operation which reduce the potential for human error
  - Each of these attributes should be considered for improving the dependability of SACs
  - Each may not be necessary or practical for each SAC

Attributes of Proven Value in Improving Human Performance

- Use of reader/worker/checker systems
- Independent verification
- Positive feedback systems
- Interlocks
- Warning signs and barriers
- Alarms and monitors
- Human factor analysis

Attributes of Proven Value in Improving Human Performance (Continued)

- Operator training and certification
- Continuing training and re-qualification
- Abnormal event response drills
- Ergonomic considerations in procedures
- Dry runs for non-routine operations
- Use of double staffing or direct supervision for hazardous operations
- Human Reliability Assessment

DOE O 5480.19, Conduct of Operations Requirements for DOE Facilities

- Conduct of Operations is a key Safety Management Program
  - Committed to in HNF-11724
  - Implementing the facility-appropriate portions improves dependability of SACs
  - Two key elements of ConOps for SACs described in the Order
    - Independent Verification
    - Lockout/Tagout

Independent Verification

- SACs, which require operation of SSCs, or verification of components condition or position, should be included in the facility's independent verification program
- These verifications should be identified explicitly in facility procedures or other official documents

Performing Independent Verifications

- Each check constitutes:
  - Actual identification of the component or action
  - Determination of both its required and actual positions or condition
- To be independent:
  - Interaction between operator and verifier minimized (Separate checks)

Lockout/Tagout

- Used to support SACs where SACs require that equipment, components or equipment controls be placed in a specific position or condition during operations to support the safety basis
  - Each facility should have a Lockout/Tagout program that meets the guidelines in DOE O 5480.19 and is consistent with 29 CFR 1910
  - Ensures that SAC requirements are implemented using detailed administrative procedures, training of personnel,and uniquely identifiable tags

Instrumentation & Controls and Support Equipment Used to Support SACs

- Should meet performance requirements consistent with the importance of the safety function of the SAC
- Similar to SSC support system OPERABILITY requirements for SSCs implemented through LCOs

Training and Qualification Requirements for SACs

- Sources of Training Requirements
  - 10 CFR 830, Subpart A, Quality Assurance Requirements
  - DOE O 5480.20A, Personnel Selection, Qualification and Training Requirements for DOE Nuclear Facilities

Key Points to be addressed for Specific ACs in training programs

- Minimum qualification and experience requirements of the personnel performing the task.
- Job Task Analysis (JTA) for the Specific AC.
- Initial training requirements for each important variable in the JTA, hazard analysis, or other basis documents being used to develop the Specific AC
- Continuing Training Requirements

Treatment of Specific ACs in the TSRs

Module 4 Terminal Objective

Explain how SACs are implemented through the TSRs.

Module 4 Enabling Objectives

- Identify the two methods used to implement SACs in the TSRs, and explain when each should be used.
- Identify the DOE Directives that should be used for guidance when developing LCOs or Directive Action ACs to implement SACs.
- Compare and contrast the benefits of LCOs vs. Specific Directive Action ACs for implementation of SACs.
- Discuss the specific limitations associated with establishing SACs for facility Material at Risk (MAR) limits.
- Identify the sections of the TSRs that are affected based on implementing SACs through the TSRs.

Methods of Incorporating SACs in the TSRs

- SAC as an Limiting Condition for Operation (LCO)
- SAC as a Specific Directed Action AC

Specific AC as an LCO

- SACs should be implemented as LCOs when:
  - the SAC is well defined,
  - clear corrective actions are available, and
  - conditions supporting the Specific AC can be easily surveilled.

SAC as an LCO (Continued)

- Standard LCO format is used
- Guidance for developing LCOs is given in DOE G 423.1-1
- Key components of LCO that should be used
  - Action Statements
  - Operability
  - Surveillance Requirements
  - Bases

SAC as an LCO (Continued)

- Advantages of SACs as LCOs
  - Elevates the importance of the controls from an operations standpoint,
  - Improves the dependability of the control through routine verification of control operability through LCO Surveillance Requirements.
  - Provides increased flexibility through the use of action statements.

SAC as a Specific Directed Action AC

- Used when:
  - it is essential that the Specific AC be performed when called upon every time and without any delay (e.g., hoisting limits for nuclear explosives, MAR limits, or expected responses during criticality safety infractions not covered by an LCO) or
  - when definitive program requirements for specific activities can be stated.

Limitations of SACs as Specific Directive Action ACs

- A violation of a Specific Directive Action AC is an immediate TSR violation.

MAR Considerations

- MAR assumption violations place the facility in a formally unanalyzed space for which consequences would be unknown and potentially unbounded.
- Not normally possible to control MAR with an active or passive Structure, System, or Component (SSC). Under normal circumstances MAR cannot be controlled through a Design Feature (DF) or SSC based LCO.
- Use of an LCO is warranted when a defensible estimate can be made of how much of a MAR exceedance can occur.
- It may be possible to make an estimate of the risk involved in exceeding the analyzed MAR for some time interval to support LCO action times as well as associated surveillance frequencies.
- If no estimate can be made of potential MAR exceedances to support action times and surveillance frequencies, or if the LCO is too complex and unwieldy, it would **NOT** be appropriate to use a TSR LCO format.

TSR Content Supporting SACs

- Definitions
  - Specific AC Definition
- Use and Application
  - should define the ground rules for treating SACs, including treatment of non-compliances as TSR violations and associated reporting requirements.

SAC Violation Reporting and Failure Analysis

Module 5 Terminal Objective

Upon completion, the student will understand and be able to describe the requirements associated with SAC violations.

Module 5 Enabling Objectives

- Explain how both forms of SACs used in the TSRs can be violated.
- Describe the notification requirements for violation of SACs and the source of these requirements
- Describe the requirements for Causal and Failure Analyses related to violations of SACs
- Identify the DOE Directives that provide guidance for investigating TSR violations

Identifying Violations of SACs

- **For an SAC in the format of an LCO, a violation occurs when:**
  - The required ACTION is not performed within the prescribed interval
  - The associated surveillance is not performed within the prescribed interval
- **For an SAC in the format of a directive action statement, a violation occurs when:**
  - The required ACTION is not performed as specified (eg, immediately)

Sources of Requirements for Reporting SAC Violations

- TSR Rule (830.205)
- DOE Order 231.1A, Environment, Safety, and Health Reporting
- DOE M 231.1-2, Occurrence Reporting and Processing of Operations Information

Requirements for Reporting SAC Violations

- Violation of a TSR should be reported verbally in 30 minutes to RL Senior Management, with a follow-up e-mail as soon as practicable.
- The chain of command should be used for notifications, however, the intent is to notify the RL Deputy Manager as soon as possible
- Also 30 minute notification to EM and follow-up with an e-mail message. The AMSE (or delegates) will make these notifications
  - RIMS - "A violation of Hazardous Energy Controls where there are no credible barriers left between the worker and the energy source, regardless of whether or not there was an injury. (EM 4.0)"

Condition Payment of Fee Criteria

- Two Third Degree Nuclear Safety performance criteria
  - Technical Safety Requirement/Operational Safety Requirement Violation - Greater than 3 incidents at an individual nuclear facility/activity or greater than 10 incidents overall in any 12 month period.
  - Positive Unreviewed Safety Question Determinations Not Self-Identified - Greater than 1 incident at an individual nuclear facility/activity or greater than 3 incidents overall in any 12 month period.

Sources of Guidance for Investigating and Reporting SAC Violations

- DOE G 231.1-2, Occurrence Reporting Causal Analysis Guide
- DOE G 231.1-1, Occurrence Reporting and Performance Analysis Guide
- DOE-NE-STD-1004-92, Root Cause Analysis
- NUREG/CR-6751, The Human Performance Evaluation Process: A Resource for Reviewing the Identification and Resolution of Human Performance Problems

Notifying DOE of Violations of SACs

- The TSR Rule (830.205) requires DOE notification for TSR violations
- DOE M 231.1-2 categorizes TSR violations (except SL violations and late surveillances) as Significance Category 2 and requires prompt (2 hours) notification to the DOE Facility Representative and written notification by close of business on the next business day

Causal and Failure Analysis Requirements for a Violation of a SAC

- DOE Order 231.1A requires occurrence reports to be submitted in accordance with DOE M 231.1-2
- DOE M 231.1-2 prescribes the significance category (SC2 for SAC violations, or SC-R for recurring violations). The significance category in turn prescribes investigation and reporting requirements:
  - ➢ Causal analysis by a trained investigator for a SAC violation
  - ➢ A full root cause analysis by a team of trained investigators for a recurring SAC violation

Guidance for Causal and Failure Analysis for a Violation of an SAC

- DOE G 231.1-2, *Occurrence Reporting Causal Analysis Guide*, provides guidance on how to determine the Apparent Cause(s) of specific reportable occurrences including Specific AC violations. However, Identifying the causes for Specific AC violations is often difficult.
- DOE-NE-STD-1004-92, *Root Cause Analysis*, provides guidance if a full root cause investigation is needed (eg, for recurring violations)
- NUREG/CR-6751, *The Human Performance Evaluation Process: A Resource for Reviewing the Identification and Resolution of Human Performance Problems*, provides additional insights for developing corrective actions

Evaluation of Specific AC Requirements

Module 6 Terminal Objective

Upon completion of this module, the student will be able to assess the contractors implementation of the requirements for SACs.

Module 6 Enabling Objectives

- Discuss the review criteria for:
  - Identification of SACs
  - Documentation of SACs in the DSA
  - Implementation of SACs through the TSRs
  - Training and qualification of operations personnel on SACs
  - SAC violation reporting and failure analysis

Review Criteria for Identification of SACs

All Administrative Controls identified in the DSA that meet the following SAC criteria are identified as SACs.

- The AC is identified in the DSA as a control needed to prevent or mitigate an accident scenario, <u>and</u>
- the AC has a safety function that would be safety significant or safety class if the function were provided by an SSC

Review Criteria for Documentation of SACs

- Does the proposed suite of controls in HA/AA reflect appropriate hierarchy of importance (preventive vs mitigative)?
- Are specific ACs identified in the DSA that provide a safety function considered safety class or safety significant and preventative or mitigative of a specific accident?
- Are proposed SACs clearly linked to HA/AA results?
- Are SACs credited in lieu of available engineered controls? If yes, is adequate logic presented and an evaluation of the SAC that demonstrates its capability to perform the expected safety function?

Review Criteria for Documentation of SACs (cont.)

- Descriptions of SACs must include bases information sufficient to provide understanding of what is controlled and why.
- If specific elements of an SMP are credited is that captured as an SAC?
- Does the TSR define ground rules for treating SACs including non-compliances/violations.
- Is the rationale for coverage of an SAC as LCO or Directive Action provided?

Review Criteria for Documentation of SACs (cont.)

- SACs must address appropriate level of reliability, by including performance expectations similar to surveillances or independent verification
- Does the SAC address personnel qualifications and training appropriately?
- Does the in-service inspection/testing program address SAC systems, consistent with commitments in DSA?
- Are material inventory controls adequately addressed in an SAC?

Review Criteria for Documentation of SACs (cont.)

- The following TSR Sections have been revised to address SACs
  - Definitions
  - Use and Application
- Specific ACs implemented as LCOs meet the requirements for LCOs listed in DOE – G 423.1-1, including:
  - Action statements
  - Operability
  - Surveillance Requirements
  - Bases

Review Criteria for Documentation of SACs (cont.)

- Is fire protection appropriately addressed by including important combustible loading assumptions as SACs?
- Has DOE documented rational for acceptance of SACs in an SER?

Review Criteria for Implementation of SACs

- Does contractor have formal process to verify availability and readiness of controls prior to implementation?
- Evidence that controls have been flowed down into procedures and personnel training
- Operator actions required by Specific ACs have been validated to ensure that the operators have sufficient indicators or alarms, time, and equipment to perform their required actions.

Review Criteria for Implementation of SACs (cont.)

- Process in place to ensure initial and periodic assessment of hazard controls effectiveness, qualifications and re-training, and change control process
- Formulation of Specific ACs includes evaluation of the following factors when establishing time necessary to complete required actions:
  - Adequate description of the task
  - Level of difficulty of the task
  - Design of the equipment and feedback, e.g. alarms.
  - Time available to do a task or recover an error.
  - Stress levels induced by the external environment, e.g. noise, heat, light and protective clothing worn.

Review Criteria for Training and Qualification of Operators/Technicians

- SACs are adequately addressed in the Operator Training Program.
  - Operator/Technician tasks associated with Specific ACs have been analyzed to identify the required knowledge, skill and abilities (KSAs)
  - Learning Objectives reflect the required KSAs
  - The appropriate training setting is used for the required KSAs (OJT, classroom or simulator)
  - The program requires demonstration of the knowledge, ability and skill to perform Specific AC tasks for operator/technician qualification and re-qualification

Review Criteria for SAC Violation Reporting and Failure Analysis

- Violation Reporting and Failure Analysis for SACs are addressed in the TSR Use and Application Section

SEPARATION

PAGE

River Protection
05.0874

SPECIFIC ADMINISTRATIVE CONTROLS

AGENDA

TIME	TOPIC	PRESENTER
1:00 p.m.	Opening Remarks	D. Bryson
1:05 p.m.	History	D. Bryson
1:15 p.m.	Specific Administrative Controls - Introduction	D. Bryson
1:30 p.m.	Identifying, Formulating, Implementing, and Maintaining SACs	M. Grigsby
2:00 p.m.	Break	All
2:10 p.m.	Methods of Incorporating SACs in the TSRs	M. Grigsby
2:30 p.m.	Tank Farm Contractor (TFC) Evaluation	R. Stevens
2:50 p.m.	Identifying Violations of SACs	M. Grigsby
3:00 p.m.	Break	All
3:10 p.m.	Review Criteria for Identification of SACs	D. Bryson
3:30 p.m.	Discussion and Lessons Learned	All
3:45 p.m.	Review Quiz	All
4:00 p.m.	Adjourn	All

SPECIFIC ADMINISTRATIVE CONTROLS

HISTORY

- DNFSB Recommendation 2002-3 (12/11/02)
  - Lack of rigor and quality assurance for operator actions/administrative controls
  - Inadequate requirements for design, implementation, and maintenance of important safety-related administrative controls
  - DOE ensure existing administrative controls be evaluated and upgraded as necessary to meet expectations

SPECIFIC ADMINISTRATIVE CONTROLS

HISTORY
(Continued)

- DOE Implementation Plan (6/26/03)
  - Training for DOE and DOE contractor personnel involved in hazard analysis, formulation of SACs, and TSR writers
- DOE STD-1186-2004 (8/31/04)

WHAT ARE SACs?

- Administrative Controls that are:
  - selected to provide preventive and/or mitigative functions for specific potential accident scenarios, and
  - which have safety importance equivalent to engineered controls that would be classified as Safety Class (SC) or Safety Significant (SS) if the engineered controls were available and selected

SPECIFIC ADMINISTRATIVE CONTROLS

Relationship of DOE STD-1186 to 10 CFR 830

- Should be used to comply with all DOE methods for DSAs and their associated TSRs for compliance with 10 CFR 830, when formulating and implementing SACs

- Replaces guidance contained in Nuclear Safety Technical Position 2003-1, *Use of Administrative Controls for Specific Safety Functions*

DOE's Expectations for SACs

- DOE has established a priority process that favors preventive over mitigative measures
  - passive design features over active controls, and
  - engineered controls over ACs
- Safety SSCs are preferred over ACs
  - ACs introduce possibility of human error
- The approved process recognizes that, where necessary or practical, ACs may play an important role in hazard prevention and mitigation.

SPECIFIC ADMINISTRATIVE CONTROLS

DOE's Approach to Formulating SACs

- Parallels existing guidance for safety SSCs.
- Based on guidance for nuclear safety design criteria found in DOE O 420.1A, Facility Safety, Section 4.1
- Guidance for Safety SSCs has been adapted to SACs

DOE's Approach to Formulating SACs

(Continued)

- Key Elements:
  - Safety analyses shall establish the identification and functions of SACs and the significance to safety of the functions of the SAC
  - The ensemble of safety controls including SACs, where designated, shall be designed and configured to provide multiple layers of protection to prevent or mitigate the unintended release of radioactive materials

DOE's Approach to Formulating SACs

Key Elements (Continued)

- Defense-in-depth, as applied to the formulation of SACs shall include conservative "design" margins
- Engineering evaluations, trade-offs, and experience shall be used to develop practical SACs that achieve the functional safety objectives
- Adequacy of SACs to perform effectively their required safety functions shall be documented in the DSA

DOE's Approach to Formulating SACs

Key Elements (Continued)

- SACs shall be formulated so that they can perform their safety functions when called upon and under a quality assurance program that satisfies 10 CFR 830, Subpart A
- Classification of Administrative Controls as SACs shall use the same criteria as used for Safety SSCs in DOE STD-3009
- SACs shall be configured with appropriate safety margins to support assurance of safety functions

DOE's Approach to Formulating SACs

Key Elements (Continued)

- Appropriate human factors engineering should be integrated with the formulation of SACs
- In some cases, SACs rely on supporting SSCs to perform their intended safety function. These SSCs should meet performance requirements consistent with their safety importance

Derivation of Hazard Controls in the DSA

- SACs may be acceptable for ensuring safe operation
  - They must be evaluated carefully when choosing safety measures for long-term hazardous activities
- Hazard controls should be identified and graded on a case-by-case basis according to the guidance in DOE G 421.1-2, DOE STD-3009, and DOE STD-1186

SPECIFIC ADMINISTRATIVE CONTROLS

Derivation of Hazard Controls in the DSA (Continued)

- The DSA may identify specific controls under a safety management program (e.g., hazardous material inventory limits) that are required for safety
  - These controls shall be designated as SACs

SPECIFIC ADMINISTRATIVE CONTROLS

Application of ACs and SACs

- Most ACs in the TSRs are designed to provide broad programmatic support for safety management programs
  - These ACs are known as programmatic ACs
  - ACs that provide specific or mitigative functions meeting the criteria for classification of SAC, are classified as SACs

Identifying SACs During Development of the DSA

- If an administrative control:
  - is identified in the DSA as a control needed to prevent or mitigate an accident scenario, and
  - has a safety function that would be safety significant or safety class if the function were provided by an SSC, then the AC shall be designated as an SAC

SPECIFIC ADMINISTRATIVE CONTROLS

Identifying Administrative Controls

- Other factors that may be useful to designate an AC, identified as a control in a hazard analysis, as an SAC include:
  - The AC is the basis for validity of the hazard or accident analyses (e.g., a hazardous material inventory, such as combustible materials or Material-at-Risk limit)
  - ACs provide the main mechanisms for hazard control (e.g., Safety SSCs are degraded, out of service, too costly to implement, or are impractical for a limited-life facility)

Formulating SACs

Nuclear facilities shall be designed with the objective of providing multiple layers of protection to prevent or mitigate the unintended release of radioactive materials to the environment. Defense in depth shall include: … the provision of multiple means to ensure critical safety functions (those basic safety functions needed to control the processes, maintain them in a safe state, and to confine and mitigate radioactivity associated with the potential for accidents with significant public radiological impact)…

DOE O 420.1A

These principles also apply to the formulation, development, and implementation of the ensemble of hazard controls, including SACs

SPECIFIC ADMINISTRATIVE CONTROLS

Formulating SACs

(Continued)

- Redundancy, independence, and diversity of hazard controls important to ensuring exposure to a high consequence accident does not come about due to the failure of a single barrier
  - Redundant: Redundancy refers to a second control to provide the same safety function (as distinguished from diverse controls)
  - Independent: Controls should be independent of the process being controlled, and to the extent practicable from other controls that have been credited

SPECIFIC ADMINISTRATIVE CONTROLS

Formulating SACs

(Continued)

- Redundancy, independence, and diversity of hazard controls are important to ensuring that exposure to a high consequence accident does not come about due to the failure of a single barrier (Continued)
  - Diverse: Diversity refers to separate controls of a dissimilar nature (as distinguished from merely redundant controls)

SPECIFIC ADMINISTRATIVE CONTROLS

Formulating SACs

(Continued)

- When SACs are part of the hazard control <u>ensemble</u>, these principles are applied to the <u>ensemble</u>.
- Designation of an SAC as the primary line of defense (i.e., control) should be avoided whenever possible
- If an SAC is the primary line of defense for protection of the public, these principles should be applied to the SAC
  - Additional controls may be needed to ensure that failure of single control does not result in a high consequence accident

SPECIFIC ADMINISTRATIVE CONTROLS

Formulating SACs

(Continued)

- DOE O 420.1A, Section 4.1.1.2 also requires that:
  - "Safety SSCs identified in accordance with this section shall, commensurate with the importance of the safety functions performed, be designed:
    (1) so that they can perform their safety functions when called upon to operate, and
    (2) under a quality assurance program that satisfies 10 CFR 830.120."
- These criteria also apply to SACs

SPECIFIC ADMINISTRATIVE CONTROLS

Formulating SACs

(Continued)

- SACs should be formulated with an appropriate margin of safety which accounts for factors such as:
  - design parameters
  - equipment trip and alarm set points
  - instrument errors
  - time to perform tasks
  - surveillance test frequencies

SAC Verification

- SACs shall be verified to perform their intended function
  - Prior to operations and periodically
  - Dry runs, procedure walk-downs, table-top exercises, and drills
- Periodic re-verification
  - For SACs implemented as LCO's, through Surveillances
  - For SACs implemented as TSR Admin Controls, through facility operations and maintenance procedures

SPECIFIC ADMINISTRATIVE CONTROLS

Implementing, and Maintaining SACs

- SACs are generally procedures which should include specifications for implementation such as:
  - Qualifications of involved personnel
  - Steps involved
  - Verification of identified limits
  - Frequency of verification
  - Requirements for any independent verifications
  - Interfaces with measuring equipment
  - Required accuracy of the equipment, etc.

SPECIFIC ADMINISTRATIVE CONTROLS

Implementing and Maintaining SACs

(Continued)

- TSRs implement these procedures and recovery actions in the event of a breakdown of the control

Implementing and Maintaining SACs

(Continued)

- SACs can be addressed as TSRs in two forms:
  - LCO
    - This format should be used when the SAC is well defined, clear corrective actions are available, and conditions supporting the SAC can be easily surveilled
  - A Specific "Directive Action" AC
    - A statement of an AC requirement in the AC section of the TSRs that prescribes a specific action to be performed in response to an observed facility condition

Implementing and Maintaining SACs

(Continued)

- Configuration Management
  - Requirements of DOE O 420.1A, Facility Safety, are applied to SACs
  - Assures the continuing capability of SACs to perform their function when called upon

Methods of Incorporating SACs in the TSRs

- SAC as an Limiting Condition for Operation (LCO)
- SAC as a Specific Directed Action AC
- SAC as a specific AC when guidance for the above methodologies are not met

SPECIFIC ADMINISTRATIVE CONTROLS

Specific AC as an LCO

- SACs should be implemented as LCOs when:
  - the SAC is well defined,
  - clear corrective actions are available, and
  - conditions supporting the Specific AC can be easily surveilled

SPECIFIC ADMINISTRATIVE CONTROLS

SAC as an LCO

(Continued)

- Standard LCO format is used
- Guidance for developing LCOs is given in DOE G 423.1-1
- Key components of LCO that should be used
  - Action Statements
  - Operability
  - Surveillance Requirements
  - Bases

SPECIFIC ADMINISTRATIVE CONTROLS

SAC as an LCO

(Continued)

- Advantages of SACs as LCOs
  - Elevates the importance of the controls from an operations standpoint,
  - Improves the dependability of the control through routine verification of control operability through LCO Surveillance Requirements.
  - Provides increased flexibility through the use of action statements

SAC as a Specific Directed Action AC

- Used when:
  - it is essential that the Specific AC be performed when called upon every time and without any delay (e.g., hoisting limits for nuclear explosives, MAR limits, or expected responses during criticality safety infractions not covered by an LCO) or
  - when definitive program requirements for specific activities can be stated

SPECIFIC ADMINISTRATIVE CONTROLS

Tank Farm Contractor (TFC) Evaluation

- Evaluated TFC ACs against DOE STD-1186
- Meets Criteria
- Meets Intent
- Actions Necessary

SPECIFIC ADMINISTRATIVE CONTROLS

TFC Evaluation Results

TANK FARMS		
AC NUMBER	AC TITLE	NEW AC DESIGNATION
AC 5.7	Safety Management Programs	Programmatic AC
AC 5.8	Emergency Preparedness	Programmatic AC
AC 5.9	Source Term Controls	Specific Directive Action AC
AC 5.10	Flammable Gas Controls	Specific Administrative Control (SAC)
AC 5.11	Transfer Controls	Specific Administrative Control (SAC)
AC 5.12	Administrative Lock Controls	Specific Administrative Control (SAC)
AC 5.13	Bulk Chemical Controls	Specific Directive Action AC
AC 5.14	Dome Loading Controls	Specific Directive Action AC
AC 5.15	Tank Farms Installed Instrumentation	Programmatic AC
AC 5.16	Corrosion Mitigation Program	Programmatic AC
AC 5.17	Vacuum Retrieval Controls	Specific Administrative Control (SAC)

SPECIFIC ADMINISTRATIVE CONTROLS

TFC Evaluation Results

(Continued)

242-A EVAPORATOR		
AC NUMBER	AC TITLE	NEW AC DESIGNATION
AC 5.6.1.1	Restriction on 242-A Evaporator and Pump Room Access	Specific Directive Action AC
AC 5.6.1.2	Sample Cubicle Leak Detection System	Specific Administrative Control (SAC)
AC 5.6.1.3	Source Strength Control	Specific Administrative Control (SAC)
AC 5.6.1.4	Fire Protection Key Element "a"	Specific Administrative Control (SAC)
AC 5.6.1.4	Fire Protection Key Element "b"	Programmatic AC
AC 5.6.1.5	Nuclear Criticality Safety	Specific Administrative Control (SAC)
AC 5.6.1.6	Evaporator Feed Verification	Specific Administrative Control (SAC)
AC 5.6.1.7	Emergency Response	Programmatic AC

SPECIFIC ADMINISTRATIVE CONTROLS

TFC Evaluation Results

(Continued)

222-S LABORATORY		
AC NUMBER	AC TITLE	NEW AC DESIGNATION
AC 5.2	Inventory Requirements	Specific Directive Action AC
AC 5.3	Contractor Organization	Programmatic AC
AC 5.4	Minimum Shift Complement	Programmatic AC
AC 5.5	Technical Safety Requirements Violations	Programmatic AC
AC 5.6.1	Radiation Protection	Programmatic AC
AC 5.6.2	Operational Safety Programs	Programmatic AC
AC 5.6.3	Emergency Preparedness Program	Programmatic AC

MAR Considerations

- MAR assumption violations place the facility in a formally unanalyzed space for which consequences would be unknown and potentially unbounded
- Not normally possible to control MAR with an active or passive Structure, System, or Component (SSC). Under normal circumstances MAR cannot be controlled through a Design Feature (DF) or SSC based LCO

SPECIFIC ADMINISTRATIVE CONTROLS

MAR Considerations

(Continued)

- Use of an LCO is warranted when a defensible estimate can be made of how much of a MAR exceedance can occur
- It may be possible to make an estimate of the risk involved in exceeding the analyzed MAR for some time interval to support LCO action times as well as associated surveillance frequencies

SPECIFIC ADMINISTRATIVE CONTROLS

MAR Considerations

(Continued)

- If no estimate can be made of potential MAR exceedances to support action times and surveillance frequencies, or if the LCO is too complex and unwieldy, it would be appropriate to use a TSR Section 5 AC

Identifying Violations of SACs

- For an SAC in the format of an LCO, a violation occurs when:
  - The required ACTION is not performed within the prescribed interval
  - The associated surveillance is not performed within the prescribed interval
- For an SAC in the format of a directive action statement, a violation occurs when:
  - The required ACTION is not performed as specified (e.g., immediately)

SPECIFIC ADMINISTRATIVE CONTROLS

Identifying Violations of SACs

(Continued)

- A TSR violation of a Programmatic AC occurs on significant programmatic breakdown

SPECIFIC ADMINISTRATIVE CONTROLS

Sources of Requirements for Reporting SAC Violations

- TSR Rule (830.205)
- DOE Order 231.1A, Environment, Safety, and Health Reporting
- DOE M 231.1-2, Occurrence Reporting and Processing of Operations Information

Notifying DOE of Violations of SACs

- The TSR Rule (830.205) requires DOE notification for TSR violations
- DOE M 231.1-2 categorizes TSR violations (except SL violations and late surveillances) as Significance Category 2 and requires prompt (2 hours) notification to the DOE Facility Representative and written notification by close of business on the next business day

SPECIFIC ADMINISTRATIVE CONTROLS

Review Criteria for Identification of SACs

- All Administrative Controls identified in the DSA that meet the following SAC criteria are identified as SACs.
  - The AC is identified in the DSA as a control needed to prevent or mitigate an accident scenario, <u>and</u>
  - The AC has a safety function that would be safety significant or safety class if the function were provided by an SSC

NOTE: DOE suggests creating a list of the ACs classified as SACs to provide documentation of ACs selected as SACs

SPECIFIC ADMINISTRATIVE CONTROLS

Review Criteria for Documentation of SACs

- The following SAC identification and documentation is provided in the DSA
  - Reason for designating the control as an SAC and its preventative or mitigative safety function
  - Description of how the SAC is to be implemented (i.e., important procedural features, including interfaces with sensors, etc.)

SPECIFIC ADMINISTRATIVE CONTROLS

Review Criteria for Documentation of SACs

(Continued)

- The following SAC identification and documentation is provided in the DSA (Continued)
  - Pertinent aspects of the SAC that relate directly to the safety function, such as qualifications of personnel required and time available to perform associated tasks
  - An evaluation of the SAC that demonstrates its capability to perform the expected safety function

Review Criteria for Implementation of SACs Through the TSRs

- Specific ACs are implemented as LCOs or as Specific Directive Action ACs
- Specific ACs implemented as LCOs meet the requirements for LCOs listed in DOE G 423.1-1, including:
  - Action Statements
  - Operability
  - Surveillance Requirements
  - Bases

Review Criteria for Implementation of SACs Through the TSRs

(Continued)

- Specific Directive Action ACs:
  - Are contained in the AC section of the TSRs
  - Clearly describe the Critical Safety Function of the SAC
  - Specify the control or limit
  - Provide a basis for the control
  - Have provisions in operations and/or maintenance procedures for periodic verification of the control or limit

Review Criteria for Implementation of SACs Through the TSRs

(Continued)

- The following TSR Sections have been revised to address SACs
  - Definitions
  - Use and Application

SPECIFIC ADMINISTRATIVE CONTROLS

Review Criteria for Implementation of SACs Through the TSRs

(Continued)

- SACs are initially and periodically verified as capable of performing the specified safety function
- Operator actions required by SACs have been validated to ensure that the operators have sufficient indicators or alarms, time, and equipment to perform their required actions

Review Criteria for Implementation of SACs Through the TSRs

(Continued)

- Formulation of SACs includes evaluation of the following factors when establishing time necessary to complete required actions:
  - Adequate description of the task in facility procedures
  - Level of difficulty of the task
  - Design of the equipment and feedback, e.g. alarms
  - Time available to do a task or recover an error
  - Stress levels induced by the external environment, e.g. noise, heat, light and protective clothing worn

SPECIFIC ADMINISTRATIVE CONTROLS

Review Criteria for Training and Qualification of Operators/Technicians

- SACs are adequately addressed in the Operator Training Program
  - Operator/Technician tasks associated with SACs have been analyzed to identify the required knowledge, skill and abilities (KSAs)
  - Learning Objectives reflect the required KSAs
  - The appropriate training setting is used for the required KSAs (OJT, classroom or simulator)
  - The program requires demonstration of the knowledge, ability and skill to perform SAC tasks for operator/technician qualification and re-qualification

SEPARATION

PAGE

Descriptions for D 50370225 DOE STD SAC: DOE-STD-1186, Specific Admin ControlsCLA

General description
This specific Administrative Controls (ACs) course is structured around DOE-STD-1186, Specific ACs. It provides training on Specific Administrative Controls (ACs) to contractor and DOE staff who support preparation/review of facility nuclear safety basis documentation. Participants will develop an understanding of the Technical Standard on Specific ACs, including identification, implementation, maintenance, and evaluation of specific ACs.

Section 1
- Background on Administrative Controls
- Overview of Specific ACs
- New DOE Technical Standard on Specific ACs
- Relationship of the New Standard to 10 CFR 830 and Supporting DOE Directives
- Sources of Requirements and Guidance Applicable to ACs
- DOEs Expectations for Specific ACs
- DOEs Approach to Formulating Specific ACs
- Derivation of Hazard Controls in the DSA
- Application of ACs and Specific ACs

Section 2:
- Identifying Specific ACs During Development of the Documented Safety Analysis
- Formulating Specific ACs
- DSA Requirements for Specific ACs
- Validation of Specific ACs
- Verification of Specific ACs
- Implementing and Maintaining Specific ACs

Section 3:
- Treatment of Safety Controls Covered by Safety Management Programs
- Implementing Specific ACs as LCOs
- Implementing Specific ACs as Specific Directive Action ACs
- MAR Limits as ACs
- Modifications to the TSRs-to Support Specific ACs

Terminal Objective
Upon completion, the student will understand and be able to apply the

requirements for identifying, implementing, and maintaining Specific Administrative Controls.

Enabling Objectives

Section 1:
• Explain why a new classification of administrative control is needed to ensure that the safety bases for DOE nuclear facilities is adequately established and maintained.
• Define the term Specific AC (SAC)
• Explain the relationship of DOE-STD-1186 to 10 CFR 830, DOE-STD-3009, and the other DSA safe harbors identified in 10 CFR 830.
• Discuss DOE's expectations and approach for using SACs as part of the ensemble of hazard controls.

Section 2:
• State the criteria used to identify an administrative control as a Specific AC
• State the specific requirements or documentation of SACs in the DSA.
• State the nuclear safety requirements for design of nuclear facilities as described in DOE O 420.1, and relate these requirements to formulation and implementation of SACs.
• Relate the concept of "Safety Margin" to the formulation of SACs
• Describe the following concepts as they relate to development of SACs:
- Redundancy
- Independency
- Diversity
• Explain the process for verifying and validating the effectiveness of SACs, both prior to and after implementation of SACs
• Explain how SACs are implemented and maintained.

Section 3:
• Identify the two methods used to implement SACs in the TSRs, and explain when each should be used.
• Identify the DOE Directives that should be used for guidance when developing LCOs or Directive Action ACs to implement SACs.
• Compare and contrast the benefits of LCOs vs. Specific Directive Action ACs for implementation of SACs
• Discuss the specific limitations associated with establishing SACs for facility Material at Rish (MAR) limits
• Identify the sections of the TSRs that are affected based on implementing SACs through the TSRs.

Target Audience
Applies to employees and subcontractors involved in the preparation or review of Safety Analysis documents or for Category 2 and 3 Nuclear Facilities personnel as follows:

1. Manufacturing and Quality Assurance Operations Managers, Shift

Managers, and Shift Technical Advisors
2. Engineering Organization / Departments as follows:
- Safety Analysis Engineering (all technical personnel)
- Category 2 Nuclear Facilities Engineering (all technical personnel)
- Cat 3/Non/Nuclear Facilities Engineering (all technical personnel in departments shown below) -
- Cat 3 Design Engineering
- Cat 3 System Engineering
- Process and Product Engineering (all technical personnel in departments shown below)
- Surveillance and Assembly Process Engineering
- EU Metalworking Process Engineering
- EU Chemical Process Engineering
- Procedure Writers
- Nuclear Project and Design Engineering
- Fire Protection Design

Mandate
DOE-STD-1186-2004

Lesson Plan Loc/Auth
Building 9739S, Room 153, Janice Ramsey, 13391 (574-6483)

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Course EE000498 – DOE-STD-1186 Specific Administrative Controls (SACs)
Course Description and Learning Objectives

Course Description

The DOE-STD-1186 SAC training covers formulation, implementation, maintaining, and evaluation of SACs in accordance with the Standard. The course material addresses the background and history of SACs, identifying, formulating, implementation, and maintaining of SACs. The course also includes treatment of SACs in the Technical Safety Requirements and SAC assessments.

Course Objective:

Upon completion, the student will understand and be able to apply the requirements for formulating, implementing, maintaining, and evaluating Specific Administrative Controls.

Module 1 Learning Objectives:

- Explain why a new classification of administrative control is needed to ensure that the safety bases for DOE nuclear facilities is adequately established and maintained.
- Define the term Specific AC (SAC).
- Explain the relationship of DOE-STD-1186 to 10 CFR 830, DOE-STD-3009, and the other DSA safe harbors identified in 10 CFR 830.
- Discuss DOE's expectations and approach for using SACs as part of the ensemble of hazard controls.

Module 2 Learning Objectives:

- State the criteria used to identify an administrative control as a Specific AC.
- State the specific requirements for documentation of SACs in the DSA.
- State the nuclear safety requirements for design of nuclear facilities as described in DOE O 420.1, and relate these requirements to formulation and implementation of SACs.
- Relate the concept of "Safety Margin" to the formulation of SACs.
- Describe the following concepts as they relate to development of SACs:
    - Redundancy
    - Independency
    - Diversity
- Explain the process for verifying and validating the effectiveness of SACs, both prior to and after implementation of SACs.
- Explain how SACs are implemented and maintained.
- Explain how proper Conduct of Operations improves the dependability of SACs.
- Explain the requirements associated with SAC instrumentation & control and support equipment.
- Identify the general requirements for operator training programs at nuclear facilities.

- Identify the INPO recommendations for establishing a safety culture that improves SAC dependability.

Module 3 Learning Objectives:

- Identify the two methods used to implement SACs in the TSRs, and explain when each should be used.
- Identify the DOE Directives that should be used for guidance when developing LCOs or Directive Action ACs to implement SACs.
- Compare and contrast the benefits of LCOs vs. Specific Directive Action ACs for implementation of SACs.
- Discuss the specific limitations associated with establishing SACs for facility Material at Risk (MAR) limits.
- Identify the sections of the TSRs that are affected based on implementing SACs through the TSRs.
- Explain how both forms of SACs used in the TSRs can be violated.
- Identify the DOE Directives that provide guidance for investigating TSR violations.

Module 4 Learning Objectives:

- Discuss the process for performing self-assessments.
- Discuss to process for identifying SACs for inclusion in the TSRs.

DOE-STD-1186-2004
SPECIFIC ADMINISTRATIVE CONTROLS TRAINING

Instructor:
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Topics for Specific AC Training

- Introduction
- Identifying, Formulating, Implementing, and Maintaining Specific ACs
- Treatment of Specific ACs in the TSR
- Specific AC Assessment

SPECIFIC ADMINISTRATIVE CONTROLS

Introduction

Course Objective

Upon completion, the student will understand and be able to apply the requirements for formulating, implementing, maintaining, and evaluating Specific Administrative Controls.

Module 1 Learning Objectives

- Explain why a new classification of administrative control is needed to ensure that the safety bases for DOE nuclear facilities is adequately established and maintained.
- Define the term Specific AC (SAC).
- Explain the relationship of DOE-STD-1186 to 10 CFR 830, DOE-STD-3009, and the other DSA safe harbors identified in 10 CFR 830.
- Discuss DOE's expectations and approach for using SACs as part of the ensemble of hazard controls.

Background on Administrative Controls

- DOE-STD-3009-94 addresses derivation of ACs with major significance to defense in depth, or worker safety [DOE-STD-1186 Section 1.5, page 4]
  - Primarily related to safety management programs
  - Not specific accident risk reduction
- DOE G 423.1-1 recognizes that ACs may be applied for risk reduction of individual accident scenarios [DOE-STD-1186 Section 1.5, page 5]
  - ACs should be a direct result of the DSA, but they may also result from institutional requirements
  - ACs should be considered for defense in depth
  - ACs (may) specifically state a limit or specific requirement rather than a generic safety management program

History of DNFSB Recommendation 2002-3

"DOE should promulgate a set of requirements for safety-class and safety-significant administrative controls to establish appropriate expectations for the design, implementation, and maintenance of these important safety controls. The requirements should address the following at a minimum:

(a) Specific design attributes to ensure effectiveness and reliability;

(b) Specific TSRs and limiting conditions of operation;

(c) Specific training and qualifications to ensure that the appropriate facility operators, maintenance and engineering personnel, plant management, and other staff properly implement each control

History of DNFSB Recommendation 2002-3

(d) Periodic re-verification that each control remains effective; and

(e) Root cause and failure analyses, similar to those required upon failure of an engineered system.

DOE should ensure that all existing administrative controls that serve the function of a safety-class or safety-significant control are evaluated against these new requirements and upgraded as necessary and appropriate to meet DOE's expectations."

HB-Line example discussed in DNFSB Recommendation. Other examples discussed include LANL and Oak Ridge Y-12 .

DOE Implementation Plan for 2002-3

DOE IP 2002-3 – "Plan includes:

1) Finalizing the assessment of existing DOE requirements and guidance;
2) Consolidating and clarifying existing DOE rule guidance and standards to ensure that contractors consistently develop, implement, and maintain critical administrative controls consistent with their importance to safety;
3) Consolidating and clarifying the guidance to federal employees for reviewing existing safety bases to assure proper implementation of DOE's requirements;

DOE Implementation Plan for 2002-3

DOE IP 2002-3 – Plan includes:

4) Ensuring that critical administrative controls in use in the DOE complex meet Departmental expectations;

5) Strengthening the DOE processes that ensure the effectiveness and dependability of administrative controls; and

6) After completion of implementation reviews and use of interim guidance, revising as necessary Part 830 safe harbor methodologies to ensure continued proper interpretation and application of DOE requirements."

What are SACs?

- Administrative Controls that are:
  - selected to provide preventive and/or mitigative functions for specific potential accident scenarios, and
  - which have safety importance equivalent to engineered controls that would be classified as Safety Class (SC) or Safety Significant (SS) if the engineered controls were available and selected.

[DOE-STD-1186 Section 1.2, page 2]

Why are SACs needed?

- DOE recognizes a need to:
  - Improve the dependability of these controls, and
  - Enhance their availability to perform specific safety functions when needed, commensurate with their safety importance.

[DOE-STD-1186 Section 1.2, page 2]

New Technical Standard on SACs

- Issued on August 31, 2004 as DOE-STD-1186-2004
- Establishes DOE expectations and guidance for formulation, implementation, and maintenance of Specific Administrative Controls

[DOE-STD-1186 Section 1.6, page 5]

Relationship of DOE-STD-1186 to 10 CFR 830, Nuclear Safety Management

- Should be used to comply with all DOE methods for DSAs and their associated TSRs for compliance with 10 CFR 830, when formulating and implementing SACs
- Replaces guidance contained in Nuclear Safety Technical Position 2003-1, *Use of Administrative Controls for Specific Safety Functions*

Sources of Requirements Applicable to ACs

- DSA Rule (830.204)
- TSR Rule (830.205) plus Table 4 of the Rule.
- QA Criteria (830.122)
- DOE O 420.1, Facility Safety
- DOE STD-1186-2004 SAC Standard, August, 2004

Sources of Guidance for ACs

- DOE G 423.1-1, *Implementation Guide For Use In Developing Technical Safety Requirements*
- DOE G 421.1-2, *Implementation Guide For Use in Developing Documented Safety Analyses To Meet Subpart B Of 10 CFR 830*
- DOE-STD-3009-94,*CN2, Preparation Guide For U.S Department Of Energy Nonreactor Nuclear Facility Documented Safety Analyses*
- DOE STD-1186-2004, *Specific Administrative Controls*
- DOE-STD-1120, *Integration of Environment, Safety, and Health into Facility Disposition Activities* (In Revision)

DOE's Expectations for SACs

- DOE has established a priority process that favors preventive over mitigative measures,
  - passive design features over active controls, and
  - engineered controls over ACs.
- Safety SSCs are preferred over ACs
  - ACs introduce possibility of human error.
- The approved process recognizes that, where necessary or practical, ACs may play an important role in hazard prevention and mitigation.

[DOE-STD-1186 Section 1.6, page 5]

DOE's Approach to Formulating SACs

- Parallels existing guidance for safety SSCs.
- Based on guidance for nuclear safety design criteria found in DOE O 420.1A, Facility Safety, Section 4.1
- Guidance for Safety SSCs has been adapted to SACs

[DOE-STD-1186 Section 1.6.1, page 5]

DOE's Approach to Formulating SACs (*Continued)*

- Key Elements: [DOE-STD-1186 Section 1.6.1, page 6]
  - Safety analyses shall establish the identification and functions of SACs and the significance to safety of the functions of the SAC
  - The ensemble of safety controls including SACs, where designated, shall be designed and configured to provide multiple layers of protection to prevent or mitigate the unintended release of radioactive materials

DOE's Approach to Formulating SACs
(*Key Elements* continued)

- Defense-in-depth, as applied to the formulation of SACs shall include conservative "design" margins
- Engineering evaluations, trade-offs, and experience shall be used to develop practical SACs that achieve the functional safety objectives
- Adequacy of SACs to perform effectively their required safety functions shall be documented in the DSA
- SACs shall be formulated so that they can perform their safety functions when called upon and under a quality assurance program that satisfies 10 CFR 830, Subpart A

DOE's Approach to Formulating SACs
(*Key Elements* continued)

- Classification of Administrative Controls as SACs shall use the same criteria as used for Safety SSCs in STD-3009
- SACs shall be configured with appropriate safety margins to support assurance of safety functions
- Appropriate human factors engineering should be integrated with the formulation of SACs
- In some cases, SACs rely on supporting SSCs to perform their intended safety function. These SSCs should meet performance requirements consistent with their safety importance

Derivation of Hazard Controls in the DSA

- SACs may be acceptable for ensuring safe operation
  - They must be evaluated carefully when choosing safety measures for long-term hazardous activities
- Hazard controls should be identified and graded on a case-by-case basis according to the guidance in DOE G 421.1-2, DOE STD-3009, and DOE-STD-1186
- The DSA may identify specific controls under a safety management program (e.g., hazardous material inventory limits) that are required for safety.
  - These controls shall be designated as SACs

[DOE-STD-1186 Section 1.6.2, pages 6&7]

Application of ACs and SACs

- Several ACs in the TSRs are designed to provide broad programmatic support for safety management programs
  - These ACs are known as programmatic ACs
  - ACs that provide specific or mitigative functions meeting the criteria for classification of SAC, are classified as SACs

[DOE-STD-1186 Section 1.6.4, page 8]

Questions?

Identifying, Formulating, Implementing, and Maintaining Specific ACs

Module 2 Terminal Objective

Explain how SACs are identified, formulated, implemented, and maintained.

Module 2 Learning Objectives

- State the criteria used to identify an administrative control as a Specific AC.
- State the specific requirements for documentation of SACs in the DSA.
- State the nuclear safety requirements for design of nuclear facilities as described in DOE O 420.1, and relate these requirements to formulation and implementation of SACs.
- Relate the concept of "Safety Margin" to the formulation of SACs.

Module 2 Learning Objectives (Continued)

- Describe the following concepts as they relate to development of SACs:
  - Redundancy
  - Independency
  - Diversity
- Explain the process for verifying and validating the effectiveness of SACs, both prior to and after implementation of SACs.
- Explain how SACs are implemented and maintained.

Module 2 Learning Objectives (Continued)

- Explain how proper Conduct of Operations improves the dependability of SACs.
- Explain the requirements associated with SAC instrumentation & control and support equipment.
- Identify the general requirements for operator training programs at nuclear facilities.
- Identify the INPO recommendations for establishing a safety culture that improves SAC dependability.

Identifying SACs During Development of the Documented Safety Analysis

- If an administrative control:
  - is identified in the DSA as a control needed to prevent or mitigate an accident scenario, and
  - has a safety function that would be safety significant or safety class if the function were provided by an SSC, then the AC shall be designated as an SAC.

[DOE-STD-1186 Section 2.1, page 10]

Identifying Administrative Controls (continued)

Other factors that may be useful to designate an AC, identified as a control in a hazard analysis, as an SAC include:

- The AC is the basis for validity of the hazard or accident analyses (e.g., a hazardous material inventory, such as combustible materials or Material-at-Risk (MAR) limit)
- ACs provide the main mechanisms for hazard control (e.g., Safety SSCs are degraded, out of service, too costly to implement, or are impractical for a limited-life facility)

Identifying Administrative Controls (continued)

- Based on the control selection methodology at SRS, ACs typically have an SS or SC function.
- However, **not** all ACs (requiring specific actions related to individual accident scenarios) rise to the level of importance of SACs. [DOE-STD-1186 Section 1.1, page 1]
- Therefore, only ACs that are credited as the primary control (e.g., 1st LOC) or protects a bounding initial condition or assumption should be considered as SACs.
- SMPs credited as a primary control are not SACs.

Identifying Administrative Controls (continued)

- Some existing ACs in SRS TSRs may appear to be written as a SAC (e.g., AC contains a limit) but do not meet DOE-STD-1186 criteria to be a SAC.
- DOE suggests creating a list of the ACs classified as SACs to provide documentation of ACs selected as SACs.

Formulating SACs

"Nuclear facilities shall be designed with the objective of providing multiple layers of protection to prevent or mitigate the unintended release of radioactive materials to the environment. Defense in depth shall include: ... the provision of multiple means to ensure critical safety functions (those basic safety functions needed to control the processes, maintain them in a safe state, and to confine and mitigate radioactivity associated with the potential for accidents with significant public radiological impact)...".

DOE O 420.1A

These principles also apply to the formulation, development, and implementation of the ensemble of hazard controls, including SACs.

[DOE-STD-1186 Section 2.2, page 11]

Formulating SACs *(Continued)*

<u>Redundancy</u>, <u>independence</u>, and <u>diversity</u> of hazard controls are important to ensuring that exposure to a high consequence accident (with significant public radiological impact) does not come about due to the failure of a single barrier.

- <u>Redundant</u>: Redundancy refers to a second control to provide the same safety function (as distinguished from diverse controls)
- <u>Independent</u>: Controls should be independent of the process being controlled, and to the extent practicable from other controls that have been credited
- <u>Diverse</u>: Diversity refers to separate controls of a dissimilar nature (as distinguished from merely redundant controls)

[DOE-STD-1186 Section 2.2, pages 11&12]

Formulating SACs *(Continued)*

- When SACs are part of the hazard control ensemble, these principles are applied to the ensemble.
- Designation of an SAC as the primary line of defense (i.e., control) should be avoided whenever possible
- If an SAC is the primary line of defense for protection of the public, these principles should be applied to the SAC
  - Additional controls may be needed to ensure that failure of single control does not result in a high consequence accident

Formulating SACs *(Continued)*

- DOE O 420.1A, Section 4.1.1.2 also requires that:
  - "Safety SSCs identified in accordance with this section shall, commensurate with the importance of the safety functions performed, be designed:
    - (1) so that they can perform their safety functions when called upon to operate, and
    - (2) under a quality assurance program that satisfies 10 CFR 830.120."
- These criteria also apply to SACs.

Formulating SACs *(Continued)*

- SACs should be formulated with an appropriate margin of safety which accounts for factors such as:
  - design parameters
  - equipment trip and alarm set points
  - instrument errors
  - time to perform tasks
  - surveillance test frequencies

Lessons Learned in Formulating SACs

- Explicit ACs are widely used in SRS TSRs but are not identified as such since they were developed before the DOE-STD-1186 existed. However, several of these ACs meet the intent of the Standard.
- Existing ACs are not required to be revised or relocated to a separate SAC section in the TSR but some method should be used (e.g., TSR violation section) to identify/list existing ACs that are classified as SACs.
- Vague definitions of TSR violations can lead to ambiguity in determining if a single non-compliance of an SAC should be considered a TSR violation.

DSA SAC Requirements

- Similar to Safety SSCs, the following SAC identification and documentation should be provided in the DSA.
  - Reason for designating the control as an SAC and its preventative or mitigative safety function
  - Description of how the SAC is to be implemented (i.e., important procedural features, including interfaces with sensors, etc.)
  - Pertinent aspects of the SAC that relate directly to the safety function, such as qualifications of personnel required and time available to perform associated tasks
  - An evaluation of the SAC that demonstrates its capability to perform the expected safety function

DSA SAC Requirements (Continued)

- The DSA should provide information (generally Chapter 5) to support the derivation of hazard controls described in the TSR document.
  - Content is the linking document between the DSA hazard analysis that results in the designation of SACs and their required safety functions and attributes, and the TSR document
  - TSR and SAC procedure writers will refer to the DSA through this chapter to identify the accident scenarios that generated the need for the SAC (in Chapter 3), and information on its safety function and required attributes
  - Chapter 5 should provide a summary description of this information and references to the supporting information in Chapters 3 and 4

SAC Validation

- If SACs require operator action, assurance should be provided that the operators can adequately perform their required tasks by analyzing the following human performance factors at a minimum:
  - Adequacy of the description of the task in facility procedures
  - Level of difficulty of the task
  - Design of the equipment and feedback, e.g. indicators, alarms, etc.
  - Time available to do the task or recover an error
  - Stress levels induced by the external environment, e.g. noise, heat, light and protective clothing worn

[DOE-STD-1186 Section 2.2, pages 13&14]

SAC Validation (Continued)

- Formal engineering calculations may be necessary to ensure that operators have the time and resources necessary to perform SAC tasks
- If SACs require operator action similar to SC SSCs, an HRA should be used to validate the dependability of the SAC

SAC Verification

- SACs must be verified to perform their intended function
  - Prior to operations and periodically
  - Dry runs, procedure walk-downs, table-top exercises, and drills
- Periodic re-verification
  - For SACs implemented as LCO's, through Surveillances
  - For SACs implemented as TSR Admin Controls, through facility operations and maintenance procedures

[DOE-STD-1186 Section 2.2, page 14]

Implementing, and Maintaining SACs

- SACs are generally procedures which should include specifications for implementation such as:
  - Qualifications of involved personnel
  - Steps involved
  - Verification of identified limits
  - Frequency of verification
  - Requirements for any independent verifications
  - Interfaces with measuring equipment
  - Required accuracy of the equipment, etc.
- TSRs implement these procedures and recovery actions in the event of a breakdown of the control

[DOE-STD-1186 Section 2.3, page 14]

Implementing, and Maintaining SACs (Continued)

- SACs can be addressed as TSRs in two forms:
  - LCO
    - This format should be used when the SAC is well defined, clear corrective actions are available, and conditions supporting the SAC can be easily surveilled
  - A Specific "Directive Action" AC
    - A statement of an AC requirement in the AC section of the TSRs that prescribes a specific action to be performed in response to an observed facility condition

Implementing, and Maintaining SACs (Continued)

- Configuration Management
  - Requirements of DOE O 420.1A, Facility Safety, are applied to SACs
  - Assures the continuing capability of SACs to perform their function when called upon

[DOE-STD-1186 Section 2.3, page 15]

DOE O 5480.19, Conduct of Operations Requirements for DOE Facilities

- Conduct of Operations is a key Safety Management Program
  - Addressed in the DSA as such
  - Implementing the facility-appropriate portions improves dependability of SACs
  - Two key elements of ConOps for SACs described in the Order
    - Independent Verification
    - Lockout/Tagout

[DOE-STD-1186 Section 3.2, pages 16-18]

Instrumentation & Controls and Support Equipment Used to Support SACs

- Should meet performance requirements consistent with the importance of the safety function of the SAC
- Similar to SSC support system OPERABILITY requirements for SSCs implemented through LCOs

[DOE-STD-1186 Section 3.3, page 18]

10 CFR 830 Requirements for Training and Qualification of Personnel

- 10 CFR 830, Subpart A, Quality Assurance Requirements, Section 830.122 establishes the following criteria for Management/Personnel Training and Qualification:
  - Train and qualify personnel to be capable of performing their assigned work.
  - Provide continuing training to personnel to maintain their job proficiency.

[DOE-STD-1186 Section 3.4.1, page 19]

Key Points to be addressed for Specific ACs in training programs

- Minimum qualification and experience requirements of the personnel performing the task.
- Job Task Analysis (JTA) for the Specific AC.
- Initial training requirements for each important variable in the JTA, hazard analysis, or other basis documents being used to develop the Specific AC
- Continuing Training Requirements

[DOE-STD-1186 Section 3.4.2, page 20]

INPO Recommendations on Safety Culture Most Relevant to Dependable Implementation of SACs

- Communicate expectations and work plans accurately and frequently. When work processes are changing daily, job briefings and use of repeat backs are encouraged.
- Inform coworkers, supervisors, and managers when there is a potential problem with performing a task. Perform post-job critiques to identify process improvements.
- Anticipate error-likely situations. Most hazardous activities require both the worker and the backup/supervisor to understand the work process.
- Verify instructions, equipment, location, and time constraints.

[DOE-STD-1186 Section 3.5, page 21&22]

INPO recommendations on safety culture most relevant to dependable implementation of SACs (Continued)

- Focus attention on the task. Think through the steps and key decision points of a task before acting.
- Expect success, but anticipate failure. Routinely ask "what if."
- Take the time to do the job right.
- Make sure schedules do not interfere with safety.
- Follow approved procedures with a sense of caution.
- Stop the task and collaborate with others when unfamiliar or unanticipated conditions arise.

Questions?

Treatment of Specific ACs in the TSRs

Module 3 Terminal Objective

Explain how SACs are implemented through the TSRs.

Module 3 Learning Objectives

- Identify the two methods used to implement SACs in the TSRs, and explain when each should be used.
- Identify the DOE Directives that should be used for guidance when developing LCOs or Directive Action ACs to implement SACs.
- Compare and contrast the benefits of LCOs vs. Specific Directive Action ACs for implementation of SACs.
- Discuss the specific limitations associated with establishing SACs for facility Material at Risk (MAR) limits.

Module 3 Learning Objectives (continued)

- Identify the sections of the TSRs that are affected based on implementing SACs through the TSRs.
- Explain how both forms of SACs used in the TSRs can be violated.
- Identify the DOE Directives that provide guidance for investigating TSR violations.

Methods of Incorporating SACs in the TSRs

- SAC as an Limiting Condition for Operation (LCO)
- SAC as a Specific Directed Action AC

[DOE-STD-1186 Section 4.2, pages 23&24]

Specific AC as an LCO

- SACs should be implemented as LCOs when:
  - the SAC is well defined,
  - clear corrective actions are available, and
  - conditions supporting the Specific AC can be easily surveilled.

[DOE-STD-1186 Section 4.2, page 24]

SAC as an LCO (Continued)

- Standard LCO format is used
- Guidance for developing LCOs is given in DOE G 423.1-1
- Key components of LCO that should be used
  - Action Statements
  - Operability
  - Surveillance Requirements
  - Bases

[DOE-STD-1186 Section 4.2, page 24]

SAC as an LCO (Continued)

- Advantages of SACs as LCOs
  - Elevates the importance of the controls from an operations standpoint,
  - Improves the dependability of the control through routine verification of control operability through LCO Surveillance Requirements.
  - Provides increased flexibility through the use of action statements.

SAC COURSE – EE000498

Example SAC as an LCO

3.1 INVENTORY CONTROLS

3.1.1 TRU WASTE STORAGE FACILITY MAR INVENTORY CONTROL

LCO 3.1.1: The total quantity of nuclear material present at the WASTE STORAGE FACILITY shall be less than or equal to 2000 curies equivalent of Pu-239.

AND

No single 55-gallon drum shall contain greater than 150 curies equivalent of Pu-239.

MODE APPLICABILITY: At All Times

PROCESS AREA APPLICABILITY: WASTE STORAGE FACILITY

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more 55-gallon drums contains greater than 150 curies equivalent of Pu-239.	A.1 Suspend all radioactive waste movements within 10 feet of the non-compliant drum(s). **AND** A.2 Restore compliance with the LCO limits.	1 Hour 3 Weeks

SAC COURSE – EE000498

Example SAC as an LCO (Continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. The WASTE STORAGE FACILITY contains greater than 2000 curies equivalent of Pu-239.	B.1 Suspend all radioactive drum receipts and movements at the WASTE STORAGE FACILITY. **AND** B.2 Restore compliance with the LCO limits.	IMMEDIATELY 3 Weeks

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT		FREQUENCY
SR 4.1.1.1	Verify that 55-gallon drums contain less than or equal to 150 curies equivalent of Pu-239.	Prior to receipt
SR 4.1.1.2	Verify the total quantity of nuclear material present at the WASTE STORAGE FACILITY is less than or equal to 2000 curies equivalent of Pu-239.	Monthly

SAC as a Specific Directed Action AC

- Used when:
  - it is essential that the Specific AC be performed when called upon every time and without any delay (e.g., hoisting limits for nuclear explosives, MAR limits, or expected responses during criticality safety infractions not covered by an LCO) or
  - when definitive program requirements for specific activities can be stated.

[DOE-STD-1186 Section 4.2, page 24]

Example SAC as a Specific Directive Action AC

- The facility tritium level shall be less than or equal to 50 grams.
- Transient combustibles shall be less than or equal to 50 pounds wood equivalent within a 10 foot area around the CSX Glovebox.
- Prior to transfer of spent resin from a column to a tank, implement controls to prevent tank from exceeding 9M nitric acid in solution.

Example SAC as a Specific Directive Action AC

- A calculation shall be completed at least annually to ensure the Vent filters will be flushed or replaced prior to reaching the safe ammonium nitrate accumulation limit.
- Following waste transfers, a flush of the pipe shall be performed based on the necessary volume and duration for the dose to be less than 5E+07 rem/gallon.

Lessons Learned

- Be specific on what is credited and ensure what is credited is incorporated into the implementing procedures.
- Don't write explicit statements in the TSR if they are not needed since they may result in an unnecessary TSR violation.
- SACs need to flow down into the procedures and there needs to be a verification process. Even little changes need to be verified.
- Ensure implementation plan addresses SACs.

Limitations of SACs as Specific Directive Action ACs

- A violation of a Specific Directive Action AC is an immediate TSR violation.

Limitations of SACs as Specific Directive Action ACs

- A violation of a Specific Directive Action AC is an immediate TSR violation.

  SRS Position - Except:

  – When an AC has an associated action and the actions of the AC are being met. (An AC action reflects a DOE-approved compensatory approach to restore operability – margin included)

MAR Considerations

- MAR assumption violations place the facility in a formally unanalyzed space for which consequences would be unknown and potentially unbounded.
- Not normally possible to control MAR with an active or passive Structure, System, or Component (SSC). Under normal circumstances MAR cannot be controlled through a Design Feature (DF) or SSC based LCO.
- Use of an LCO is warranted when a defensible estimate can be made of how much of a MAR exceedance can occur.
- It may be possible to make an estimate of the risk involved in exceeding the analyzed MAR for some time interval to support LCO action times as well as associated surveillance frequencies.
- If no estimate can be made of potential MAR exceedances to support action times and surveillance frequencies, or if the LCO is too complex and unwieldy, it would be appropriate to use a TSR Section 5 AC.

[DOE-STD-1186 Section 4.3, pages 24&25]

TSR Content Supporting SACs

- Definitions
  - Specific AC Definition
- Use and Application
  - should define the ground rules for treating SACs, including treatment of non-compliances as TSR violations and associated reporting requirements.
- In addition, it is helpful to include a statement of the basis of the SAC where it is invoked

[DOE-STD-1186 Section 4.4, pages 25&26]

SAC COURSE – EE000498

TSR Content Supporting SACs

- Address the definition of SACs through the DSA Derivation section (e.g., Chapter 5) which derives the type of TSR controls.
- Address the "Use and Application" of SACs through the DSA Derivation section and the Violations section typically in the TSR ACs.
- In the TSR Section on Violations there should be a separate entry identifying the SACs (TSR Methodology Manual format)

TSR Content Supporting SACs

- As a minimum, a basis for the SAC must be included in the DSA (e.g., Chapter 5) that provides sufficient documentation to support the selection and performance expectations and addresses:
  - Hazard/accident for which the control is credited (link SAC to the hazard and accident analysis)
  - Specifics on what is credited (e.g., the safety function, functional performance requirements)

Identifying Violations of SACs

- **For an SAC in the format of an LCO, a violation occurs when:**
  - The required ACTION is not performed within the prescribed interval
  - The associated surveillance is not performed within the prescribed interval
- **For an SAC in the format of a directive action statement, a violation occurs when:**
  - The required ACTION is not performed as specified (eg, immediately)

Identifying Violations of SACs (continued)

Excerpts from AC 5.8.2, "TSR Violations" which identifies the list of SACs;

- Failure to meet both the requirements of a specific AC and its associated action for those specific ACs in Sections {5.2.2b, 5.7.1.11, and 5.7.2} constitutes a TSR violation.
- Failure to comply with specific ACs in Sections {5.7.1.1 through 5.7.1.10} constitutes a TSR violations.

Sources of Requirements for Reporting SAC Violations

- TSR Rule (830.205) (requires DOE notification for TSR violations)
- DOE Order 231.1A, Environment, Safety, and Health Reporting (requires occurrence reports per DOE M 231.1-2)
- DOE M 231.1-2, Occurrence Reporting and Processing of Operations Information (categorizes TSR violations and requires prompt 2-hour and written notifications)

[DOE-STD-1186 Section 5.2, page 27]

Sources of Guidance for Investigating and Reporting SAC Violations

- DOE G 231.1-2, Occurrence Reporting Causal Analysis Guide (prescribes significance category and investigation and reporting requirements)
- DOE G 231.1-1, Occurrence Reporting and Performance Analysis Guide
- DOE-NE-STD-1004-92, Root Cause Analysis
- NUREG/CR-6751, The Human Performance Evaluation Process: A Resource for Reviewing the Identification and Resolution of Human Performance Problems (insights for developing corrective actions)

Questions?

Specific AC Assessments

Module 4 Terminal Objective

Explain how SACs assessments are to be performed.

Module 4 Learning Objectives

- Discuss the process for performing self-assessments.
- Discuss to process for identifying SACs for inclusion in the TSRs.

Self-Assessments for SACs

- SRS Facilities will be performing self-assessments (except SWMF, F-Canyon and FB-Line)
  - Using DSA/TSR Criteria for Selection/ Implementation of ACs
  - Performed on one or more representative hazard/accident analysis with SACs

DSA/TSR Criteria for Section/Implementation of ACs

- Hazard/Accident Analysis
  - Are specific administrative controls identified in the DSA that are needed to prevent or mitigate the consequences of an accident?
  - Do ACs have a safety function that is considered to be safety significant or safety class if the function were provided by an SSC?
  - Are proposed specific or general administrative controls (i.e., safety management programs) clearly linked to the hazards and accident events in the HA/AA?

DSA/TSR Criteria for Section/Implementation of ACs

- Hazard/Accident Analysis (continued)
  - Are specific administrative controls credited in lieu of available engineered controls?
  - If yes, is adequate logic/discussion provided to support the selection?
  - Does this explicit treatment also flow into TSR derivation, SMP Chapters, and the TSR?

DSA/TSR Criteria for Section/Implementation of ACs

- DSA Derivation of TSR Controls
  - Descriptions of Specific ACs in a DSA must be sufficiently detailed so that a basic understanding is provided of what is controlled and why. The description must include bases information sufficient to derive TSR administrative controls for specific control functions.

DSA/TSR Criteria for Section/Implementation of ACs

- DSA Derivation of TSR Controls (continued)
  - Are TSR administrative controls adequately derived?
    - Justification/Basis provided for selection of AC so that a basic understanding is provided of what is controlled and why.
    - Specificity is adequate to derive TSR administrative controls for specific control functions.

DSA/TSR Criteria for Section/Implementation of ACs

- TSRs
  - Does the TSR define the ground rules for treating Specific ACs, including treatment as non-compliances as TSR violations?
  - Are specific ACs and limits specified in the DSA presented in the TSR?
  - What rationale for coverage either in LCO format or AC section?

DSA/TSR Criteria for Section/Implementation of ACs

- TSRs (continued)
  - Are those specific ACs written to address an appropriate level of reliability?
  - Do ACs include performance expectation similar to surveillance or independent verification, frequency of performance, etc.?

DSA/TSR Criteria for Section/Implementation of ACs

- TSRs (continued)
  - Are material inventory controls addressed in the ACs section?
  - 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.)?

DSA/TSR Criteria for Section/Implementation of ACs

- TSRs (continued)
  - 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?

DSA/TSR Criteria for Section/Implementation of ACs

- DSA/TSR Implementation Aspects
  - Does the contractor have a formal process in place to verify availability and readiness of controls prior to implementation?

DSA/TSR Criteria for Section/Implementation of ACs

- DOE Safety Basis Review Process
  - Has an appropriate level of DOE review been placed on selection and implementation of administrative controls as reflected in DOE SERs?
  - Are there review criteria specifically focused on specific ACs for their selection and derivation?

Assessments to Identify SACs

- Prior to next annual update an evaluation of ACs should be performed to identify SACs
- Revise the DSA and TSR as necessary to identify SACs.

Questions?

SEPARATION

PAGE

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United States Government

Department of Energy

memorandum

Carlsbad Field Office
Carlsbad, New Mexico 88221

DATE: APR 27 2005

REPLY TO ATTN OF: CBFO:OOM:CFW:VW:05-0037:UFC:3420

SUBJECT: Training for DNFSB Recommendation 2002-3, Specific Administrative Controls

TO: Robert Goldsmith, Acting Deputy Assistant Secretary for Integrated Safety Management and Operations Oversight

This memorandum is to submit the Waste Isolation Pilot Plan (WIPP) Specific Administrative Controls (SACs) Training Plan (attached) in support of the Department of Energy (DOE) Implementation Plan for Defense Nuclear Safety Board (DNFSB) Recommendation 2002-3, as requested by Charles Anderson's memorandum of February 28, 2005. The training course meets the standards of DOE O 5480.20A, Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities. It incorporates the expectations outlined in Mr. Anderson's memo and addresses the SACs identified in the WIPP Contact-Handled Waste Documented Safety Analysis (DSA) and its associated Technical Safety Requirements (TSRs).

The course consists of three modules: (1) Introduction, (2) Identifying, Formulating, Implementing, and Maintaining SACs, and (3) Treatment of SACs in TSRs. It will be conducted on May 13, 16, and 18 to include all Carlsbad Field Office (CBFO) staff and Washington TRU Solutions (WTS) personnel responsible for the development and implementation of SACs. CBFO Technical Assistance Contractor (CTAC) staff supporting the review and assessment of safety basis are also required to attend the training. Upon completion of the training, CBFO will submit a report to your office by May 31, 2005.

If you have any questions, please contact me at (505) 234-7300 or Dr. Chuan-Fu Wu at (505)234-7552.

Inés Triay

Inés R. Triay
Acting Manager

Attachment

cc: w/attachment

P. Golan, EM-2	*ED
P. Bubar, EM-3.1	ED
T. Wright, EM-3.2	ED
L. Piper, CBFO	ED
C. Wu, CBFO	ED
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*ED denotes Electronic Distribution

CBFO:OOM:CFW:VW:05-0037:UFC:3420

WASTE ISOLATION PILOT PLANT (WIPP)

Specific Administrative Controls (SACs) Training Plan

This training is developed in support of the DOE Implementation Plan for Defense Nuclear Safety Board (DNFSB) Recommendation 2002-3, Specific Administrative Controls. The course meets the standards of DOE O 5480.20A, Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities. It incorporates DOE Headquarters (DOE/HQ) expectations and addresses the SACs included in the WIPP Contact-Handled Waste Documented Safety Analysis (DSA). Carlsbad Field Office (CBFO) staff and Washington TRU Solutions (WTS) personnel responsible for the development and implementation of SACs are required to complete the training. CBFO Technical Assistance Contractor (CTAC) staff supporting the review and assessment of safety basis are also required to attend the training.

The following is a list of individuals who are scheduled to attend the training:

CBFO Staff

Chuan-Fu Wu, Authorization Basis Senior Technical Advisor
George Basabilvazo, Director, Office of Disposal
Richard Farrell, Safety Officer
Don Galbraith, Facility Representative
Mike Oliver, Facility Systems Engineer
Ernest Preciado, Waste Operations Program Manager
Greg Sahd, Security and Emergency Operations Program Manager
Steve Casey, General Engineer
Daryl Mercer, Physical Scientist

CTAC Staff

Andy Stanley
Jim Waters

WTS Personnel

Managers

Doug Steffen
Tom Lex
Randy Britain
Bob Wade
Subhash Sethi
Johnny Marrs

Bob Kirby
Leroy Bostick
Steve Youngerman
Tom Fabian
Mike Lipscomb
Steve Herndon
Don Harward
Mansour Akbarzadeh

Facility Shift Managers

Russ Stroble
Tex Winan
Richard Marshall
Alvy Williams

Facility Operations (all CMRO's and Roving Watches)

Underground Facility Operations Engineers

Underground Roving Watch Personnel

Waste Handling Operators

Radiological Control Technicians

Waste Hoist Operators

Top and Bottom Landers

Mr. Steve Gallagher, a qualified Technical Training Instructor, will conduct the training on May 13, 16 and 18 in Training Room 3&4 of the Technical Training Building. Each day there will be two sessions of four hours each. All three modules are covered in each four-hour session. The morning session will start at 7:30 and the afternoon session will begin at 12:30. Cognizant managers are responsible for scheduling their staff with technical training (x-8646) to one of the scheduled presentations. Managers are also responsible for ensuring their staff complete the training as required.

This training will include the following three modules:

Module 1. Introduction
Background on Administrative Controls
History of DNFSB Recommendation 2002-3
DOE Implementation Plan for 2002-3
What are SACs?

Why are SACs needed?
New Technical Standard on SACs
Relationship of DOE-STD-1186 to 10 CFR 830
Sources of Requirements Applicable to ACs
Sources of Guidance for ACs
DOE's expectation for SACs
DOE's approach to formulating SACs
Derivation of Hazard Controls in the DSA
Application of ACs and SACs

Module 2. Identifying, Formulating, Implementing, and Maintaining SACs
Identifying SACs during development of the Documented Safety Analysis
Formulating SACs
Lessons Learned in formulating SACs
DSA SAC requirements
SAC validation
SAC verification
Implementing, and Maintaining SACs
DOE O 5480.19, Conduct of Operations requirements for DOE Facilities
Instrumentation & Controls and support equipment used to support SACs
10 CFR 830 Requirements for Training and Qualification of Personnel
Key Points to be addressed for Specific ACs in training programs
INPO recommendations on safety culture most relevant to dependable implementation of SACs

Module 3. Treatment of SACs in DSA/TSRs
Methods of Incorporating SACs in the TSRs
Specific AC as an LCO
SAC as a Specific Directed Action AC
TSR Content supporting SACs
Identifying violations of SACs or an LCO
Sources of requirements for reporting SAC violations
Sources of guidance for investigating and reporting SAC violations

Technical Training will track attendance at each session and submit the training record to the WTS Chief Nuclear Engineer by May 23. WTS will provide a report to CBFO by May 25 for the CBFO to prepare a summary report for submission to DOE/HQ by May 31, 2005.