WSRC-MS-99-00073

Implementing An Integrated Commitment Management System at the Savannah River Site Tank Farms

Art Blanchard
Westinghouse Savannah River Company
Aiken, SC 29808

Brian J. Trawinski and Jeffrey A. Selvey
Westinghouse Safety Management Solutions, LLC
Aiken, SC 29804

This document was prepared in conjunction with work accomplished under Contract No. DE-AC09-96SR18500 with the U. S. Department of Energy.

Abstract

Recently, the Savannah River Site Tank Farms have been transitioning from pre-1990 Authorization Basis requirements to new 5480.22/.23 requirements. Implementation of the new Authorization Basis has resulted in more detailed requirements, a completely new set of implementing procedures, and the expectation of even more disciplined operations. Key to the success of this implementation has been the development of an Integrated Commitment Management System (ICMS) by Westinghouse Safety Management Solutions. The ICMS has two elements: the Authorization Commitment Matrix (ACM), and a Procedure Consistency Review methodology. The Authorization Commitment Matrix is a linking database, which ties requirements and implementing documents together. The associated Procedure Consistency Review process ensures that the procedures to be credited in the ACM do in fact correctly and completely meet all intended commitments. This Integrated Commitment Management System helps Westinghouse Safety Management Solutions and the facility operations and engineering organizations take ownership in the implementation of the requirements that have been developed.

The Integrated Commitment Management System is a nine-step process:

1. Identify commitments and assumptions in Authorization Basis documents.
2. Group similar commitments together, and develop a Master Commitment statement.
3. Develop Procedure Review Criteria for each Master Commitment.
4. Identify procedures or other implementing documents that meet each Master Commitment.
5. Identify the driver that causes each implementing document to be performed.
6. Evaluate each identified procedure against the Procedure Review Criteria, develop recommendations tied to the criteria, and determine the significance of each recommendation.
7. Track each recommendation to closure.
8. Maintain procedures on an ongoing basis, consulting the ACM when making changes.
9. Maintain the ACM database on an ongoing basis, ensuring the accuracy of the online version.

The ICMS process has resulted from experience with developing/maintaining linking databases, as well as a review of best practices and lessons learned from other facilities at Savannah River Site and across the DOE complex. The ICMS approach has the benefit of being easily transferable. The ICMS methodology and database structure can be applied to any operating facility within the DOE complex and beyond. Although the ICMS process is being implemented in the Tank Farms in parallel with the implementation of a new Authorization Basis, it can be applied equally well to facilities with an established AB. Additionally, the ICMS can go beyond AB requirements, encompassing Process Hazard Reviews, environmental requirements, and other legal and regulatory commitments as well.

Introduction

This paper will discuss the implementation of an Integrated Commitment Management System at the Savannah River Site Tank Farms, as well as the application of this same system to other facilities at SRS. The two aspects of the ICMS, Implementing Document Consistency Reviews and Authorization Commitment Matrix, will be discussed at length.

Discussion

Definitions

Throughout this paper, certain key words will appear with specific meanings. These key words are defined as follows:

Master Commitment -- an implementable statement derived from Source Document requirements

Source Document -- documents containing the requirements to which a facility must operate

Implementing Document -- documents implementing Source Document requirements

Authorization Commitment Matrix -- a linking database that ties Source Document requirements to Implementing Documents through Master Commitments

Implementing Document Consistency Review (also known as Procedure Consistency Review) -- detailed review of Implementing Documents against Master Commitments and a set of Review Criteria to ensure each Implementing Document correctly, consistently, and completely meets each intended Master Commitment

History

In 1994, a team of Engineering personnel was commissioned to develop a document that showed how the SRS Tank Farms complied with their Authorization Basis. The result was the initial issue of the SRS Tank Farms Linking Document, which matched each control statement from a selected group of AB documents (e.g., OSRs, Technical Standards, Interim OSRs) with the procedures that implemented the control statement. A discussion was provided to explain how the listed procedures implemented the requirement, in terms of the process areas each procedure applied to and the ways in which the procedures worked together. Some controls were met by two or more procedures working together (e.g., both must be performed), while others could be met by one of a number procedures (e.g., either a loop procedure or a roundsheet reading could satisfy the requirement).

In 1996, the Linking Document underwent a major format revision. Instead of listing the implementation of each control statement individually, which resulted in a great deal of repetition and a corresponding increase in the cost of maintenance and the difficulty of use, the new revision grouped similar control statements together under a Summary Requirement, and then addressed the implementation of that Summary Requirement for the Tank Farms. Summary Requirements fell into one of four broad categories: Mandated Surveillance Requirements, Non-Mandated Surveillance Requirements, Operational Limits, and Administrative Controls. The Linking

Document addressed each Summary Requirement on a one-page form; it also included supporting appendices to show details such as how the Summary Requirement was derived, and where each procedure was discussed.

By late 1997, work was underway on the development and implementation of a new Authorization Basis for the Tank Farms that was compliant with the 5480.22 and 5480.23 DOE Orders. As part of this implementation, it was recognized that a new or revised Linking Document was needed; additionally, facility management wanted a special procedure review conducted to provide assurance that credited procedures did in fact meet the new AB requirements without going overboard (for example, by establishing tighter-than-AB limits and then flagging those limits as the AB requirements, potentially resulting in the declaration of events at a higher classification than was truly warranted).

Based on discussions with facility management as well as a review of lessons learned during the development and maintenance of the existing Linking Document, it was decided to maintain the existing Linking Document as a description of current AB compliance (until transition to the new AB was complete) and in parallel develop a new Authorization Commitment Matrix to describe compliance with the new AB and to provide the tools necessary to perform the special procedure reviews. This was the beginning of the Integrated Commitment Management System Process, which has been refined over the course of the last 18 months.

The Integrated Commitment Management System Process

The Integrated Commitment Management System is a nine-step process with the goal of establishing a baseline set of Implementing Documents that correctly, consistently, and completely meet all Source Document Requirements, and then providing the tools to ensure that the baseline Source Document compliance condition is maintained. The two elements of the ICMS are the Authorization Commitment Matrix, and an Implementing Document Consistency Review methodology.

The Authorization Commitment Matrix is a linking database that ties Source Document requirements to Implementing Documents through a set of Master Commitments. This database is Quality Assurance controlled and Configuration Managed, in order to assure the accuracy of the database contents and to eliminate the necessity for having a controlled paper document. The ACM is available through the site intranet (ShRINE) so that it can be viewed (and updated, with appropriate password) from anywhere on site. It is intended that the ACM be a living database; once developed, it continues to be maintained as Source and/or Implementing Documents are developed, revised, or cancelled -- experience has shown that it is more cost-effective and beneficial to maintain an ACM versus the alternate approach (practiced at some facilities in the past) of developing an ACM from scratch every time a revision to the AB occurs.

The Implementing Document Consistency Review is performed on Implementing Documents using information contained in the ACM (e.g., Master Commitments, Review Criteria). At the Savannah River Site Tank Farms, it is performed as part of the procedure development process, so IDCR recommendations can be dispositioned as any other comments. The IDCR supplements, but is not equivalent to, the normal Engineering technical review / USQ process.

The following items describe the nine steps of the ICMS in greater detail:

Step One: Identification of Source Document Requirements and Assumptions

The first step in the ICMS process is to identify requirements from Source Documents. Typically, the set of Source Documents being evaluated will be the facility's Authorization Basis documents, but may include lower-tier and/or non-AB documents, such as Process Requirements, Process Hazards Reviews, and Environmental Permits. Each of the selected Source Documents is reviewed for statements containing requirements and/or assumptions; these statements are then loaded into the ACM.

At a minimum, the ACM contains all implementable statements from the selected Source Documents.
A statement is considered implementable if it requires the facility to perform an action to ensure compliance.

Implementable statements include requirements (e.g., "the facility shall calibrate Instrument X at a frequency of 3 months") and non-conservative assumptions (e.g., "Instrument X, which is located outdoors, shall be maintained at between 40 and 60 degrees Fahrenheit"). The actions required by these implementable statements are driven by and documented in Implementing Documents (typically procedures, but may be other documents as well).

Additionally, the ACM may contain other statements from the Source Documents, such as Design Features and conservative assumptions. The implementation of these statements will typically be by a design document; otherwise, a statement will be made to the effect that the statement is directly implemented or is bounding.

Step Two: Consolidation of Similar Source Document Requirements into Master Commitments

Once the full set of requirement statements has been identified from the Source Documents, the next step is to consolidate those statements into a group of Master Commitments. A Master Commitment is intended to address and summarize a number of similar and related Source Document requirements. The consolidation step has two aspects: combination, and subdivision.

For the most part, the process of developing Master Commitments involves combining similar (topically) requirements under one statement. For example, the Source Documents may contain several different temperature limits for a process, each one developed from a particular accident scenario. These limits would be grouped together under one Master Commitment for the process' temperature limit, with the Master Commitment capturing the most conservative aspects of the related Source Document requirements. A procedure that meets the Master Commitment by definition meets each of the related Source Document requirements.

In some cases, however, Master Commitments are developed by subdividing a Source Document requirement. This happens most often in the case of a higher-level requirement statement (e.g., a SAR control statement that is further developed into a TSR LCO and associated Surveillance Requirements) ... in this case the higher-level SAR control is linked to each of the Master Commitments developed from the associated Surveillance Requirements. However, subdivision may also occur in cases where a Source Document requirement must be performed at two different frequencies (e.g., periodically, as well as prior to an evolution) or where implementation of a Source Document requirement requires more than one Implementing Document (e.g., a procedure to perform a DOP test on a HEPA filter, as well as the HEPA filter replacement procedure which causes / drives the DOP test to be performed).

Master Commitments are developed to the greatest level of detail. Typically, one Source Document requirement is designated as the primary reference, and the Master Commitment is developed from this reference, and is supplemented / modified by the other associated Source Document requirements.

Master Commitments are developed so as to be implemented by exactly one Implementing Document for each component or transfer path. There may be cases where a component / transfer path is covered by more than one Implementing Document. Should this occur, the ACM clearly indicates by discussion or other means what is the function of each listed Implementing Document?

The end result of this consolidation effort is a set of Master Commitment statements that represents the "bottom-line" set of requirements which the facility must implement. Experience has shown that this consolidation reduces the set of requirement statements for which implementation must be addressed by a factor of three. The end result is a set of Master Commitment statements that is both mutually exclusive (each MC represents a different aspect of the AB; there is no overlap) and collectively exhaustive (taken together, the set of MCs address all aspects of the AB).

Step Three: Development of Review Criteria

Development of review criteria is conducted (optimally) in parallel with the development of the Master Commitments. Review criteria answer the question, "How is this Master Commitment to be implemented in the

Implementing Documents?"

Initially, review criteria were developed in two sets. The first set, called Global Review Criteria, encompassed general principles, which apply to most AB-implementing procedures. Global Review Criteria address topics such as the following:

- Requirements -- do the Master Commitment and all related Source Document requirements align?
- Prerequisites -- is instrumentation logged?
- Operability/Abnormal Conditions -- is the LCO entered appropriately? Is the Shift Manager notified of any discrepancies?
- Critical Steps -- are steps meeting AB requirements clearly flagged? Are these flags only applied to AB implementing steps?
- Acceptance Criteria -- are specified Acceptance Criteria equivalent to the AB limits?
- Results -- are all necessary results documented and easily compared to the Acceptance Criteria? Is there a SAT/UNSAT determination?
- Reviews/Approvals -- do necessary personnel have review signoffs? Is there a step to update tracking databases/files?

The second set of criteria was called Specific Review Criteria. Specific Review Criteria dealt with how the specific Master Commitment was to be implemented in Implementing Documents, addressing issues such as:

- Specific data to be recorded
- Specific limits to be called Acceptance Criteria
- Documentation of SAT/UNSAT
- Times to be recorded (if Implementing Document is serving to protect frequency of the commitment)
- Verification that frequency has been met

Since the Specific Review Criteria really resulted from the application of a set of general principles to each Master Commitment, a lesson learned from the first phase of ICMS implementation in the SRS Tank Farms was to eliminate the Specific Review Criteria and expand the list of Global Criteria to encompass these additional general principles. This will streamline the review process for future implementations.

Step Four: Identification of Implementing Documents for each Master Commitment

As soon as a Master Commitment has been developed and loaded into the ACM, work begins on identifying where the Master Commitment will be implemented. This will typically be in the form of a single Implementing Document for each component (as in the case of a calibration requirement) or transfer path (for an evolution-based requirement). By doing this activity up front, two benefits result.

First, it can be determined if the Master Commitment statement is too broad. If it is found that multiple procedures implement a given Master Commitment for a given component, the Master Commitment is evaluated to determine if it is really two or more commitments (for example, one that is frequency-based and one that is evolution-based).
Second, it can be determined if there are any "holes" in the implementation strategy. Has a component or potential transfer path been overlooked? Is there a need to develop new procedures not previously anticipated? In this way, the ACM serves as a proactive tool for planning an AB implementation in a facility.

Step Five: Identification of Drivers for each Implementing Document

Central to the philosophy of the Integrated Commitment Management System is the following principle:

Each Implementing Document listed in the ACM must have a driver (e.g., something that causes the Implementing Document to be performed when required).

In this way, the ACM provides assurance that every Master Commitment will be performed when it is required, and therefore the Authorization Basis is fully implemented. The ACM may credit several different items as being drivers, including a controlled surveillance tracking database, a roundsheet, or an evolution based procedure. If the driver is procedural, and resides in a different procedure from where performance of the Master Commitment occurs, then another Master Commitment is typically developed to address the driving aspect.

Step Six: Performance of Implementing Document Consistency Reviews

The first five steps of the ICMS lay the groundwork for performing the Implementing Document Consistency Reviews, by establishing the Master Commitments, linking proposed Implementing Documents to each MC, defining review criteria, and identifying drivers.

As each proposed Tank Farm Implementing Document proceeds through the development process (part of the overall AB implementation effort), it undergoes a Consistency Review. The purpose of the IDCR is to ensure each Implementing Document correctly, consistently, and completely meets all intended Master Commitments (and by extension, the associated Source Document requirements).

Typically, two people participate in an IDCR. The first person evaluates the Implementing Document versus a checklist of review criteria. Criteria not applicable are justified. Criteria not met result in recommendations being generated. The second person performs a lead review, independently checking the first person's evaluation, conclusions, and recommendations. If any disagreements exist, they are resolved before the recommendations are submitted.

Each recommendation is rated according to its significance. Significance 1 recommendations are judged to result in an AB violation if not corrected. Significance 2 represents the potential for an AB violation. Significance 3 items are for improvement, typically in the areas of technical adequacy, workability, or clarity. It should be noted that the IDCR is primarily focused on AB compliance; evaluation of technical adequacy and workability is not the primary focus, and is left to the other reviewers to accomplish primarily. However, because ID Consistency Reviewers are often knowledgeable of the facility and its systems, they will notice items outside of the strict IDCR scope -- this mechanism allows them to document those comments without burdening the tracking system with editorial / grammatical comments.

Step Seven: Resolution of Recommendations

Once submitted, each recommendation is tracked to closure. If a recommendation is closed as a part of the ID development process, it is closed at that point, so that at each stage, only open recommendations are evaluated for implementation.

At the conclusion of the development process, a Final Consistency Review is performed on the Implementing Document. This review essentially starts from a clean slate, and evaluates the approved Implementing Document against the checklist of review criteria and against all previous recommendations. If all previous recommendations are verified closed, and the checklist review indicates the Implementing Document is in compliance with all applicable review criteria, then the Implementing Document is rated Satisfactory, and the status is updated in the ACM.

Step Eight: Ongoing Maintenance of Procedures

Final Consistency Reviews establish the baseline condition of Implementing Documents, asserting that at the time of FCR, the Implementing Document correctly, consistently, and completely met all intended Master Commitments. Once the FCR is complete, responsibility for maintaining the AB-compliant posture of the Implementing Document shifts to the Engineering organization. This is accomplished as part of the normal technical review of proposed changes to the Implementing Document, and expects that the ACM will be

consulted as a tool for determining which commitments the ID implemented, as well as what the review criteria were.

Step Nine: Maintenance of the Authorization Commitment Matrix

As part of the FCR for an Implementing Document, the standard practice is for final loading / confirmation of the ACM data to occur. From that point on, the information in the ACM is considered to be configuration managed, and subject to change control. Again, responsibility for the technical accuracy of the ACM shifts at this point to the Engineering organization. As part of the technical review process, administrative procedures require the impact of proposed activities to be assessed, including those impacts against the ACM. Any changes needed to the ACM are initiated by the engineer using a formal change control process, which can be initiated from within the ACM itself (online). The main features of the change control process are documentation of "before" and "after" conditions for each piece of information changed, documentation of approvals, and validation of correct data entry.

Implementation of the ICMS at Savannah River Site

General Features of the ACM

The ACM is complex in its underlying design, yet simple for both the end user and the maintainer to operate. The end user operates within a series of five tabs for each Master Commitment. Each tab contains the same Master Commitment information on the top half of the screen, and differs only in what is presented in the bottom half. The tabs are depicted in the following figures and contain the following information:
Source Document References
Implementing Document Information
General Information
Review Criteria
Change Log





There is a toolbar for each tab that allows the end user to navigate between Master Commitments, as well as between related information within each Master Commitment (e.g., the Implementing Document information associated with each MC). The toolbar also contains buttons to sort, search, and print reports.

The "Maintenance" button on the toolbar opens another window (Figure X) which contains the Maintenance / Update functions for the database. This area of the database is only accessible with appropriate passwords.

H-Area Tank Farm

IDCRs have been completed, and the ACM has been rolled out in support of declaration of TSR implementation.

F-Area Tank Farm

The same ACM is being used to capture the FTF Source Document Requirements and Implementing Documents, using the same Master Commitments where possible. FTF items will initially be marked as UNCONTROLLED/UNVALIDATED, in contrast to the HTF CONTROLLED items.

In-Tank Precipitation Facility

The ACM is being used to support N+1 OSR implementation. Commitments have been loaded and linked to proposed Implementing Documents. As Implementing Documents are revised and confirmed to contain the appropriate commitments, the status of the ID is being updated in the ACM. The facility is using the ACM to gauge progress towards implementation of the new requirements.

Spent Fuel Storage Division

The ACM will be used to document AB compliance at four separate facilities. Two facilities are currently in progress, with the remaining two scheduled to be complete by the end of the year.

Conclusion

The ICMS is a system that has been demonstrated to be valuable to facilities in implementing (and documenting implementation of) Authorization Basis and other Source Document requirements. By integrating an Implementing Document review process into the development of the ACM linking database, the ICMS ensures the best possible baseline snapshot of AB compliance, which can then be maintained by the Engineering organization.

The intent of the ICMS is to provide a standardized methodology, which can be used to document and verify the implementation of Source Document requirements at any facility in the DOE complex. Providing this standardized methodology avoids "reinventing the wheel" while allowing the lessons learned and best practices from many facilities to be shared with all, resulting in the best possible product. While the ICMS is intended to be standardized, so that it can be brought in off-the-shelf and started up within any facility, it is also customizable to the specific needs of the individual facility.