Establishment of a Single Integrated Performance Management System (IPMS)

April 26, 2008

Proposed by: Steve Johnson, Contractor Assurance Officer, LLNL

Premise:

Much of the guidance related to "assurance" systems, functions and processes, or elements thereof, is duplicative or contradictory. There is considerable benefit to be gained by consolidation of those elements in to a single guidance document that may be referenced, if necessary, by the various "assurance systems, functions and processes.

Current Status:

CFR Rules and DOE Policies, Orders and Guides for Contractor Assurance, Quality Assurance, Integrated Safety Management (ISM) and Integrated Safeguards and Security Management (ISSM) all invoke many similar elements or overlap in unnecessarily duplicative ways. All invoke standards and requirements, assessments, issues management, metrics, worker feedback, lessons learned and continuous improvement, and others, in some form or another. Unfortunately, some guidance documents offer different definitions (assessment types) or different qualification requirements for similar functions (assessor qualification per 10 CFR 830 vs. auditor qualification per QA Order).

Impact of Current Status:

- Inconsistency and reduced effectiveness of implementation
- Net detractor from safe, secure mission execution
- Increased cost of system implementation and maintenance
- Inefficiencies in roll up of common issues
- Multiple System Description documents
- Definition inconsistencies
- Different "glossary" definitions
- (Others to be added)

Discussion:

Having been involved in and/or observed the implementation and verification of each of the noted systems, it seems obvious and intuitive to me that there is an opportunity for consolidation. However, I have attempted to provide some visual representation material to support my intuition. I provide five attachments for consideration. The first two are products of past and current efforts to graphically display the interactions between QA, CAS and the ISM/ISSM systems/programs. The following three are essentially outlines of governing requirement source documents or guides used for various purposes: familiarization, training, CRAD/Lines of Inquiry development, etc.

The attachments are:

1. QA/ISM/CAS graphic w/ ISM functions and principles depicted in there proper relationship (my opinion)

2. QA/ISM/CAS graphic w/ key elements of the three listed in tabular format side-by-side for ease of visual correlation
3. ISM Summary (originally used for development of assessment lines of inquiry)
4. QA Summary
5. CAS Summary

I have used each of the above attachments in various ways to convince myself that my intuition is still in calibration. I have played connect the elements by drawing lines to connect similar elements in all three. I have done table top lay downs of the Summaries and checked of similar elements when found in all three. I am satisfied that my intuition is not too far off the mark. The problem is in how to convince others who may be heavily vested in the "uniqueness" of one of the systems. Here is my basic logic:

- ISM and ISSM are excellent work planning, control, execution, feedback models, especially if the Principles are considered in addition to the basic five Functions. If you want to test, or embarrass your audience, ask them to name the seven Principles and discuss their relationship to the five Functions (I usually get about a 1% success rate, which should tell us something).
- The basic ISM model works for any work execution endeavor as long as we are willing to expand the Function 2, Hazard Analysis, and Function 3, Develop Controls (coupled with Principle 5, Identify the correct standards and requirements, & 6, Tailor the identified standards and requirements as appropriate) beyond E,S&H.
- Contractor Assurance is not substantively different from Function 5, Feedback and Improvement, except that it has been broadened to encompass more than E,S&H. Contractor Assurance is the Feedback and Improvement function for any work scope that may be included in the basic ISM model. So, let's not continue to pretend that they are different things.
- Quality Assurance is harder to correlate. I did it by exception. Looking at Attachement 4, the QA Summary, it seems to me that all the 10 CFR 830.122 Criteria are included in the basic ISM/CAS structure except for some of the elements under Criteria 5, Work Processes; Criteria 6, Design; Criteria 7, Procurement; and, Criteria 8, Inspection and Acceptance Testing. To me, these Criteria are the heart of what QA was originally intended to be, a Quality Engineering, Quality Control and Quality Inspection function that is integral to the overall "do work" process. My opinion is that QA has gotten away from these "do work" roles and gotten lost in some sort of mixture of doing the other Criteria, which is duplicative and sometimes at odds with ISM/ISSM and CAS.

  Note: I think a disclaimer is necessary here. My observations about the state of QA are not intended to be disrespectful to the QA Program concept. I think you will find that submariners have the utmost respect and value for QA. I just think QA has gotten away from its roots.
- Quality Assurance needs to be a stand alone program focused on its more traditional role relative to Structures, Systems and Components.

Basic Proposal:

Based on the discussion above, I think my basic proposal is obvious:

1. Establish an Integrated Performance Management System using the ISM model, but reconstituted to be generic relative to type of work, hazards and controls.
2. Declare CAS to be the single Feedback and Improvement model.
3. Require all functional disciplines/functional areas such a Nuclear Safety, E, S, H, S&S, Cyber, EM, and others that are added in the business arena to defer to this single model. All that will be required is to "load" the IPMT with the necessary work scope, hazards and requirements information – we call this Work Planning and Control, don't we.
4. Eliminate all system descriptions other than a single IPMT description, if we still feel we must have a system description.
5. Eliminate duplicative system descriptive and definition material from all other source documents.

Quality Assurance Program

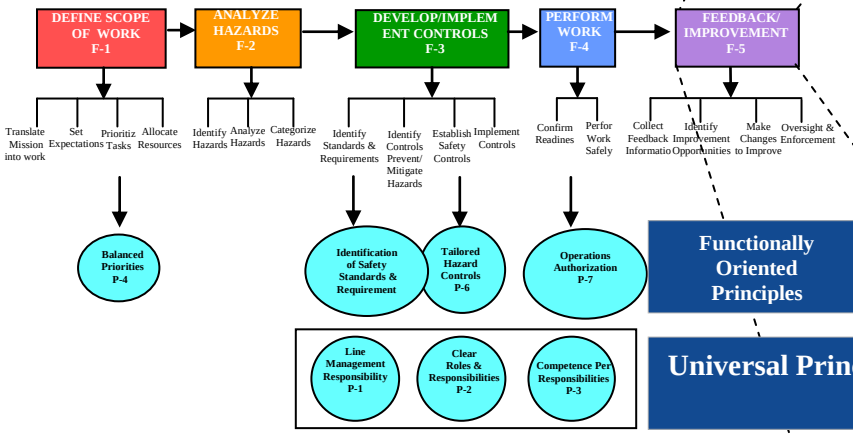
10 CFR 830.122, Quality Assurance Criteria

Management:
- Program
- Personnel Training and Qualifying
- Quality Improvement
- Documents and Records

Performance:
- Work Processes
- Design
- Procurement
- Inspection and Acceptance Testing

Assessment:
- Management Assessment
- Independent Assessment

ISM Functions and Principles



Contractor Assurance System

DOE O 226.1A

- Assessments
- Worker Feedback
- Lessons Learned
- Issues Management
- Reporting
- Performance Measures/Metrics

17 Contract Element Categories (H-4)

a. Vision, mission, accountability
b. CAS description
c. Annual assurance statement
d. NNSA notification of system changes
e. CAS validation process
f. Key activity qualification and training
g. Risk based requirements acceptance
h. Risk based self-assessment
i. Performance metrics process
j. Risk management process
k. Risk based resource allocation
l. Performance expectation defined
m. Issues Management
n. Root cause and corrective action
o. Continuous Improvement
p. Lessons Learned
q. Timely communication to CO

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- Procurement
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Assessment:
- Management Assessment
- Independent Assessment

ISM Functions and Principles

Define Scope of Work F-1
- Translate Mission into work
- Set Expectations
- Prioritize Tasks
- Allocate Resources

Analyze Hazards F-2
- Identify Hazards
- Analyze Hazards
- Categorize Hazards

Development Controls F-3
- Identify Standards and Requirements
- Identify Controls to Prevent/Mitigate Hazards
- Establish Safety Controls
- Implement Controls

Perform Work F-4
- Confirm Readiness
- Perform work safely

Feedback Improvement F-5
- Collect Feedback Information
- Identify Improvement Opportunities
- Make changes to improve
- Oversight and Enforcement

Universal Principles

- Line Management Responsibility P-1
- Clear Roles & Responsibilities P-2
- Competence Per Responsibilities P-3

Functionally Oriented Principles

- Balanced Priorities P-4
- Identification of Safety Standards & Requirements P-5
- Tailored Hazard Controls P-6
- Operations Authorization P-7

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Integrated Safety Management System Outline

Ref: DOE G 450. 4 – 1.B

Principle 1: Line Management Is Responsible For Safety

- Management defines essential management R2A2 with respect to Safety.
- Management ensures compliance with essential legal and contractual requirements.
- Management defines and implements the standards and expectations necessary to provide assurance that workers, the public, and the environment are adequately protected.
- Managers ensure that the Behavior Based Safety program supports the
- Managers are held accountable for safety performance.
- Managers are visibly present at work sites, addressing safety issues.
- Managers invite and encourage employees at all levels to participate in development and implementation of the ISMS.
- Managers emphasize the importance of individual accountability for performing work safely.

Principle 2: Clear and Unambiguous Lines of Authority and Responsibility for Ensuring Safety Shall Be Established and Maintained at All Organizational Levels

- Roles and responsibilities for safety functions are clearly defined.
- Incumbents responsible for safety have authority commensurate with their accountability.
- Ensure that safety and health representatives oversee work sites.
- Provide site-specific training to subcontractors.
- Safety professionals review and approve subcontractor safety plans and hazard communications before subcontractors start any project.

Principle 3: Competence Commensurate with Responsibilities

- Management determines the basis for selecting individual qualifications for specific positions/job responsibilities.
- Qualifications and capabilities are provided via position/job descriptions, resumes for key personnel, or other similar descriptions.
- Training, qualification and certification are conducted and maintained to satisfy specific capability requirements in accordance with established procedures.

Core Function 1: Define Scope of Work; and,
Principle 4: Balanced Priorities

Describing the Work

- Line management establishes a formal process for translating mission statements into scope of work, that is used to establish expectations for satisfactory completion, prioritization of tasks and allocation of resources.

- Discrete task statements should track back to mission objectives.

Determining the Level of Detail

- The level of detail in a scope of work should be commensurate with the importance of the work, its complexity, and the potential risk of the associated hazards.

Establishing Expectations

- There should be one or more methods for establishing expectations for satisfactorily defining work, accomplishing work, prioritizing tasks, and allocating resources
- Enhance the ability to define expectations clearly by the use of multidisciplinary teams to conduct preliminary hazard analyses and develop hazard controls. The formality required depends on the amount of work, its complexity, and the hazards. For complex, hazardous activities, a detailed work plan may be warranted, using inputs from operational staff who follow written procedures that require verbatim compliance. For low hazard, simple activities, the method for establishing expectations may be much less formal; for example, simple verbal instructions provided by a supervisor to a worker may suffice.

Worker Participation in Work Planning

- Define and incorporate into written procedures, mechanisms for incorporating worker involvement and input to the work planning processes.
- Involve workers early in the planning process.
- Involve workers directly in the preparation and review of planning documentation and job hazard analysis, and ensure that planners incorporate input from workers on proposed work methods, hazards, and controls.
- Line managers are held accountable for including workers in the work planning process.
- Benchmark other sites where management/worker trust has been successfully addressed.
- Incorporate improved management/worker relationships into the supervisory process using trust-building exercises and other behavioral change approaches.
- Develop, publish, and make visible work planning-related performance indicators that the workers can directly affect.
- Provide training for supervisors, managers, and work planners regarding effective use of worker input.
- Establish safety committees.
- Perform job hazard analyses.
- Workers walk around with management.

Providing Integration

- Integrate environment, safety, and health into the processes for work planning, budgeting, authorization, execution, and change control.
- Formal documentation exists to establish clear lines of authority within each organization for defining the scope of work, including approval of subsequent changes.

- Combine multiple work permits to ensure that integration flows down to the first-line managers and workers. This single document should contain all hazard information and controls required by the individual permits.

Establishing Priorities

- Protecting the public, workers and the environment is the top priority.
- Provide adequate resources and ensure that those resources are effectively allocated.
- Ensure a proper resource balance among competing priorities by establishing a process for reconciling internal and external resource conflicts and imposing change control.
- Achieve the goal of defining work and allocating resources so that work is done safely and contributes to accomplishment of the DOE mission. Manage tradeoffs including negotiating work scope, establishing performance objectives, identifying resources, selecting personnel, and adjusting schedules.

Core Function 2: Analyze Hazards

- The objective is to develop an understanding of the potential for the hazard to affect the health and safety of the worker, the public, and the environment.
- Analysis includes two steps: 1) identify and categorize the hazard; and 2) analyze accident scenarios related to hazardous work.
- In analyzing hazards, workers are a valuable resource due to their knowledge of processes and hazards.
- Hazard Analysis processes are tailored to the nature of the facility or project lifecycle – broad, simple tools may be adequate in the early stages of design; for nuclear facilities, DOE 5480.23 and 10DFR830.200 apply.
- Two methods of Hazard Analysis are commonly used at the facility and task level: Process Hazard Analysis (PHA); and, Job Hazard Analysis (JHA).
- For decommissioning activities, 29CFR1910, 29CFR1926, 10CFR71, and 10CFR 1021 apply.
- Automated Hazard Analysis (AHA) should integrate all requirements.
- The level of management involvement in reviewing and approving the Hazard Analysis should be commensurate with the complexity of the work and the hazards entailed.
- If the Hazard Analysis Core Function is not properly executed, Core Function 3, Develop and Implement Controls, has little chance of success.

Core Function 3: Develop and Implement Controls;
Principle 5: Identification of Safety Standards and Requirements; and,
Principle 6: Hazard Controls Tailored to the Work Being Performed

Identification of Appropriate Standards

- Terms and conditions that define DOE safety expectations are set forth as contractual requirements, Contract List B – derived from Rules, DOE Orders, Technical Standards, Guides, Manuals and National Consensus Standards.

- S/RIDS is the approval process for establishing ES&H requirements.
- Standards should be implemented through site level manuals.
- Before work is preformed, appropriate controls are developed and an applicable set of safety standards and requirements is identified.
- Specific controls needed at the activity level are developed using the results of Activity Hazard Analyses.
- The hierarchy of controls (i.e., engineering, administrative, and personal protective equipment) are applied in a risk-based manner.
- In general, the use of administrative controls to address each hazard should be minimized where the effectiveness and value of engineering controls can be demonstrated.
- Develop/Implement Controls may also occur during activities that define the scope of work, analyze hazards, or provide feedback and improvement.

Sitewide Requirements

- Line management, health and safety professionals, and workers should tailor the set of standards that apply to the work at each management level.

Facility-Specific Requirements (Identification of Appropriate Controls)

- ISMS should provide a process to identify engineering, administrative, and personal protective equipment controls and pollution prevention/waste minimization options imposed on the work, as derived from the agreed-upon set of standards and requirements.
- Derived controls should be tailored to the work and the associated hazards.
- Controls should encompass all aspects of the work (including potential abnormal or emergency situations) and each phase of work performance (preparation, review, authorization, and execution).
- Controls should address preventive and mitigative considerations, passive and active aspects and automatic versus manual operating needs.
- Specific controls derived from the agreed-upon set of standards and requirements may take several forms: engineered controls, written procedures, or other administrative controls. The form selected should be tailored to the hazard or importance of the desired attribute and, again, should be determined by line management responsible for the work based on safety/hazard analyses. The controls should be tailored considering the knowledge, skills, and abilities of the work force.
- Once a set of controls has been established, processes should be provided for maintaining work performance within the safety envelope established in the safety/hazard analysis. A process to review, approve, and provide change control of the safety envelope should exist.

Worker Protection

- There should be a written worker protection program that describes an integrated management organization and support systems that fully satisfy DOE worker protection requirements of all technical disciplines.
- Workers are to be allowed, through their supervisors, to stop work when they discover conditions that may expose them to imminent danger of other serious hazards. The stop work procedure should be exercised in a justifiable and responsible manner.

- Employees should be involved in worker protection committees to promote employee participation in developing program goals, objectives, and performance measures, and identifying and correcting workplace hazards.
- Employees should be encouraged to perform informal worksite inspections as part of their daily work.

Core Function 4, Perform Work; and
Principle 7, Operations Authorization

Startup and Restart of Nuclear Facilities

- Identify and implement safety controls before starting work.
- There should be a process to confirm adequate preparation, including adequacy of controls, prior to authorizing work to begin at the facility, project, or activity level.
- DOE 425.2 series, Startup and Restart of Nuclear Facilities, provides readiness guidance for nuclear facilities.
- The extent of documentation and level of authority for agreement prior to startup or restart shall be tailored to the complexity and hazards associated with the work.
- The QA Rule, 10CFR830.120, requires that work be performed to established technical standards and controls.
- For certain sitewide systems and activities, such as fire protection, emergency planning, and operator training, readiness may be confirmed periodically.
- DOE Order 430.1series, Life-Cycle Asset Management, provides similar requirements for non-nuclear facilities.
- The DOE Chemical Management Handbook provides guidance for specific programmatic chemical safety management considerations wherever chemical hazards exist in nuclear or non-nuclear facilities.
- ISMS should ensure that safety control measures are integrated into work performance and that:

1. Personnel are responsible and accountable for performance of work in accordance with established controls;
2. Controls are adequate to ensure safe work performance and to prevent accidents, uncontrolled releases, or unacceptable exposures to hazardous materials;
3. Controls established for safety are a discernable part of the plan for work; and
4. Necessary safety support functions for interface functions (i.e., training, maintenance, radiological protection, etc.) have been established.

- When individual work plans, operating procedures, and maintenance procedures are used to implement safety controls at the task level, the following should be factored into the selection of worker safety controls:

1. Hands-on training, safety awareness training, and the identification of necessary personal protective equipment, which are vital in familiarizing a worker with job duties, hazards, and controls;
2. Pre-job briefings and walkdowns, which provide a good opportunity to ensure workers are aware of hazards and are knowledgeable of the proper use of prescribed controls; and
3. Worker input, which should be solicited because workers can offer creative solutions for controlling hazards in a safe yet practical and cost-effective manner.

Authorizing Work

- DOE and the contractor should formally agree upon the need for authorization agreements for those nuclear and significant hazard facilities that must perform work safely without any undue risk to the worker, the public, and the environment.
- ISMS should clearly identify the roles of the contractor and DOE in authorizing work at appropriate levels.
- Authorization protocols should be clearly delineated in the contractor's ISMS description and should clarify the understanding and agreements between the contractor and the DOE in performing hazardous work.

  Authorization Protocol = Those processes used to communicate acceptance of the contractor's integrated plans for hazardous work. Such protocols are expected to range from pre-performance review and approval by DOE of detailed safety-related terms and conditions for performing work (authorization agreement) to less rigorous oversight and post-performance assessment of the contractor's work.

- The need for an authorization agreement will depend on the organization and adequacy of the existing, contractually binding documentation containing key terms and conditions. There should be no need to duplicate S/RIDs.

  Authorization Agreement = A Documented agreement between DOE and the contractor for high-hazard facilities (Category 1 and 2), incorporating the results of DOE's review of the contractor's proposed authorization basis for a defined scope of work. The authorization agreement contains key terms and conditions (controls and commitments) under which the contractor is authorized to perform the work. Any changes to these terms and conditions would require DOE approval.

Authorization Agreement

- An Authorization Agreement may serve a number of purposes:

1. To incorporate the results of DOE's review of the contractor's proposed authorization basis for a defined scope of work.
2. To define key terms and conditions (controls and commitments) under which the contractor is authorized to perform work; these key terms and conditions must be clearly identified in the agreement and any changes to these key terms and conditions would require DOE approval.
3. To delineate the key references DOE will approve versus that information that will simply be reviewed for information (The ISMS description may also serve this function).
4. To consolidate the basis for a DOE determination to authorize operations by combining key DOE and contractor authorization basis and assessment documentation into one document.
5. To minimize the amount of correspondence required between the contractor and DOE when agreements for routine tasks and activities, requiring approval at certain unique facilities, can be approved once.

- Authorization Agreement (AA) format and content:

1. The AA addresses the following issues and follows the recommended format:

- Scope of the agreement
- DOE bases for approval
- Listing of documents that constitute the authorization basis
- Terms and Conditions
- Contractor qualifications
- Special conditions
- Effective and expiration dates
- Statement of agreement
- Exception
  - Verify that the AA states if an issue or area is not applicable, of if there are no contents.

2. Scope of agreement:
   - Verify that the work to be authorized is clearly described (specific and not too broad).
   - Verify that the work to be authorized is within the authorization basis.
   - Verify that the facility(ies) to which the AA is applied is described (specific and not too broad).

3. DOE bases for approval:
   - Verify that the bases for approval are technically strong and clearly defined.
   - Verify that the DOE approval addresses the multiple dimensions of key nuclear safety, non-nuclear safety, and environmental protection.
   - Verify that the AA addresses safety review documents of processes such as safety evaluation reports, SARs, TSRs, positive USQs, DOE oversight, ORRs/RAS, etc.
   - Verify that maintenance of AA is discussed.

4. Listing of documents that constitute the authorization basis:
   - Verify that the listing of key documents is consistent with authorization basis and DOE direction. The listing may include SERs, SARs, BIOs, TSRs, etc.; non-nuclear HASPs, EALs, and default PALs
   - Verify that the references are the correct revision.

5. Terms and conditions:
   - Verify that a process exists for the contractor to commit to DOE that the authorized work will be performed safely. This may include such measures as controls in TSRs or TSR-like documents, commitments to a non-compliance reporting process, or a process for handling violations of the AA.
   - Verify that a process exists for keeping an AA and basis current; this may include a configuration management process, a process to verify that key that key terms and conditions for DOE approval are identified, a process to verity implementation commitments or JCO, or a USQ or USQ-like process.

6. Contractor qualifications:
   - Verify the presence of a positive statement about, and justification for, DOEs confidence in the contractor's ability to perform the activities in the

facilities identified in the AA. The justification may be based on conducting DOE assessments or reviews.

7. Special conditions:
   - Verify that special conditions relating to the facility and activity have been identified, such as aspects of environmental management, safeguards/security, and property protection.
   - Verify that the AA contains a statement that permits emergency actions that depart from approved TSRs (or similar controls) when the actions are needed to protect public health and safety.
8. Effective and expiration dates:
   - Verify that the approval date and duration of the AA (or expiration date) is shown.
9. Statement of agreement:
   - Verify that the names (typed) and signatures of the DOE and contractor managers are shown.
10. Exceptions:
   - Verify that specific exceptions to Orders, other requirements, S/RIDs, the WSS process, or usual circumstances are shown, if necessary.

Core Function 5, Feedback/Improvement:

How Does Feedback/Improvement Contribute to Safety?

- Feedback and improvement complete the ISMS loop by connecting practical experiences of work conducted to planning for future work. This function in intended to:

1. Identify and correct processes or deviations that lead to unsafe or undesired work outcomes;
2. Confirm that the desired work outcomes were obtained safely; and
3. Provide managers and workers with information to improve the quality and safety of subsequent similar work.

- Mechanisms that support these goals include:

1. Worker and management observations;
2. Pre- and post-work meetings,
3. Quality and safety issue resolution processes;
4. Issue tracking systems;
5. Performance indicators;
6. Lessons learned;
7. Internal and external assessments;
8. Operational and strategic planning; and
9. Other such activities.

Who Performs Feedback and Improvement?

- Line management is directly responsible for establishing and implementing feedback and improvement programs and processes to facilitate a culture that promotes ongoing examination and learning.
- Each individual is encouraged and supported in continually asking the following questions:

1. Was the work properly identified?
2. Were the hazards properly analyzed?
3. Were the proper controls established?
4. Was the work performed as planned and with the expected outcome?
5. Are there ways to perform the work better and more safely?

What Is Feedback and Improvement?

- Feedback and Improvement are used jointly to describe the fifth Core Function, but they are not the same.
- Feedback is typically information generated from actual work or operating experience.
- Feedback may be in the form of equipment indicators, analytical tests, or observations by individuals.
- The value of feedback is obtained by analyzing the information and comparing it to requirements or expectations.
- Three outcomes of analysis are typical:

1. Verification of acceptable performance,
2. Identification of needed corrections, and
3. Identification of opportunities to improve quality of work outcome or processes.
4. Improvement is most often used to mean identification of needed corrections and identification of opportunities to improve the quality of work outcomes or processes.

- Feedback and improvement may generally be categorized by three principal activities:

1. Generate and collect data,
2. Analyze data and develop information, and
3. Improve the process or activity and share the improvement.

How Is Feedback/Improvement Applied to Work and Organizational Levels?

- The nature of the work, hazards, and the complexity of the organization guide the formality of the feedback and improvement mechanisms:

1. At some level of the organization, feedback and improvement mechanisms should be documented and routinely monitored for effectiveness and value.
2. Corrective actions or improvements should be tracked to completion. The ISM Policy requires the mechanisms intended to perform feedback and improvement to be defined in the ISMS description document.

- Feedback and improvement should be applied at all organizational levels:

1. Specific work activity,
2. Facility level, and
3. Institutional level.

How Can Feedback Sources Be Integrated?

- Consolidate feedback mechanisms.
- Form feedback process owner groups.
- Use multiple feedback results to conduct reviews and assessments.

Quality Assurance Program
10 CFR 830.122 Criteria Outline

Ref: 10 CFR 830.122

Management

1. Program:
   - Establish organizational structure, functional responsibilities, levels of authority, and interfaces for those managing, performing and assessing work.
   - Establish management processes, including planning, scheduling, and providing resources for work.
2. 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.
3. Quality Improvement:
   - Establish and implement processes to detect and prevent quality problems
   - Identify, control, and correct items, services and processes that do not meet established requirements.
   - Identify the causes of problems and work to prevent recurrence as a part of correcting the problem.
   - Review item characteristics, process implementation, and other quality-related information to identify items, services, and processes needing improvement.
4. Documents and Records:
   - Prepare, review, approve, issue, use, and revise documents to prescribe processes, specify requirements, or establish design.
   - Specify, prepare, review, approve, and maintain records.

Performance

5. Work Processes:
   - Perform work consistent with technical standards, administrative controls, and other hazard controls adopted to meet regulatory or contract requirements, using approved instructions, procedures, or other appropriate means.
   - Identify and control items to ensure their proper use.
   - Maintain items to prevent their damage, loss, or deterioration.
   - Calibrate and maintain equipment used for process monitoring or data collection.
6. Design:

- Design items and processes using sound engineering /scientific principles and appropriate standards.
- Incorporate applicable requirements and design bases in design work and design changes.
- Identify and control design interfaces.
- Verify or validate the adequacy of design products using individuals or groups other than those who performed the work.
- Verify or validate work before approval and implementation of the design.

7. Procurement:
   - Procure items and services that meet established requirements and perform as specified.
   - Evaluate and select prospective suppliers on the basis of specified criteria.
   - Establish and implement processes to ensure that approved suppliers continue to provide acceptable items and services.
8. Inspection and Acceptance Testing:
   - Inspect and test specified items, services and processes using established acceptance and performance criteria.
   - Calibrate and maintain equipment used for inspections and tests.

Assessment

9. Management Assessment:
   - Ensure managers assess their management processes and identify and correct problems that hinder the organization from achieving its objectives.
10. Independent Assessment:
    - Plan and conduct independent assessments to measure item and service quality, to measure the adequacy of work performance, and to promote improvement.
    - Establish sufficient authority, and freedom from line management, for the group performing independent assessments.
    - Ensure persons who perform independent assessments are technically qualified and knowledgeable in the areas to be assessed.

Contractor Assurance System Outline

Ref: DOE O 226.1A

A comprehensive and integrated contractor assurance system must be established:

- **consistent with the hazards and risks associated with the work performed**
- **in accordance with various laws, directives and contract terms and conditions.**

CAS must encompass activities designed to:

- **Identify deficiencies and opportunities for improvement**
- **Report deficiencies to responsible managers and authorities**
- **Implement effective corrective actions**

CAS activities must encompass:

- **Environment, Safety and Health**
- **Safeguards and Security**
- **Cyber Security and**
- **Emergency Management**
- **Note that 226.1 includes Business Practices (as will NNSA SD)**

CAS tools must include:

- **Assessments**
- **Incident/event reporting**
- **Worker feedback**
- **Issues management**
- **Lessons learned**
- **Performance indicator/measures**

Order also directs contractor to:

Provide oversight

- **Monitor all work performed (including work of subcontractors)**
- **Establish clear lines of oversight authority and responsibility**
- **Ensure assurance function personnel possess appropriate SKAs and are qualified**

Provide customer transparency

- **Produce DOE approved CAS Program Description**
- **Provide assurance and corrective action data to DOE**
- **Provide DOE unfettered access to information in order to conduct effective oversight program**

Establish effective governance

- **Integrate processes for corporate audits, third-party certifications, or external reviews**
- **Certify CAS program effectiveness by third parties**