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ARTICLE

Enhancing Operational Discipline Through an Integrated Approach

by

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In order to effectively compete in an increasingly demanding environment for highly technical products or achieve process safety, organizations must take an integrated approach to achieve an operational discipline. Implementing a procedure based discipline in conjunction with a comprehensive training program will not only result in significant cost savings, but also in the production of better products, and increased safety.

Defining policies, processes and procedures is a key component of any organization's conduct of operation. The critical work processes should first be detailed in appropriate types of procedures. These procedures become the basis of a training program once they have been developed, reviewed and deployed. Finally, performance metrics must be established as an integral part of the work processes and are used to monitor the effectiveness of activities against organizational goals.

As demonstrated in Figure 1, your performance and competitiveness improves through the effective integration of people, processes and technologies. An operational discipline incorporates the "processes" and "technologies" pieces of that equation. Your people are integrated into the solution through a comprehensive training program designed to align them with the processes and technologies.

Figure 1. GP Strategies Model for Performance Improvement

Modeling your operational discipline and defining processes.

Numerous quality management systems are available for you to incorporate in your operational discipline. Two widely accepted models are the International Standards Organization, ISO9001, and Carnegie Mellon's Software Engineering Institute's Capability Maturity Model Integration® (CMMI). Certification by the organizations promoting these standards is available only from an outside certifying body, but the underlying guidance and methodologies can be applied in any organization as a best practice.

Both systems mentioned above provide guidance on an appropriate framework of documentation to define internal processes and detail the types of procedures needed to accomplish effective planning, operation and control of the identified processes. Additionally, performance metrics are identified to monitor the implementation and continuous improvement of your management systems.

As the first step, an analysis phase identifies the processes necessary to ensure effective operation and control. It is often effective to map the process steps to aid in understanding current practices and pinpoint areas that should be improved before standardization. It is important to document the processes in this phase and not let the documentation drive the process.

Developing your procedures in a hierarchical structure.

After the processes have been identified, the program is designed and the procedure hierarchy structure must be established. The actual hierarchy and type of procedures will depend on the type of organization, but typically, documentation should be established at four different levels with each subsequent level providing more detail and expanding on the previous level. The proposed structure, as presented in Table 1, presents four different levels in a tiered documentation structure that typically meets the needs of an organization. The number and level of detail of the documentation required must be correlated to the desired outcomes of an organization's processes and should meet the needs of relevant stakeholders. Various tools such as SIPOC diagrams and RASCI charts are useful at this stage.

TIER LEVEL	DOCUMENT TYPE	DEFINITION
1	Policy/Plan	Presents definition of "WHAT"
2	Process Standard	Presents "WHO AND WHEN", establishes process steps and metrics
3	Procedure	Presents "HOW" for a specific job function
4	Work Instruction	Step by step instructions for a particular job

Table 1. Procedure Tiered Structure

It is essential to establish a clear and complete definition of each type of document to avoid confusion in future development of procedures, ensure consistency and eliminate overlapping requirements. The procedure hierarchy structure should be documented as part of the Policy/Plan.

Within each process area is a subset of procedures that provide more detail on how the tasks are performed. As shown in Figure 2, the Process Standard is considered a Tier 2 procedure. There are then two additional supporting tiers, Tier 3 (procedures) and Tier 4 (work instructions).
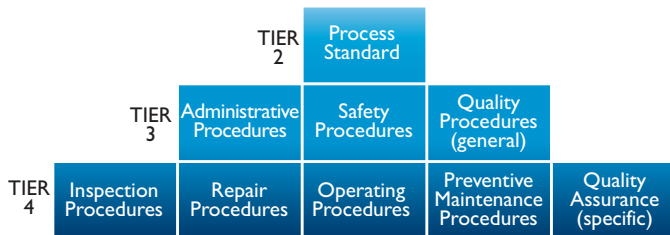
Figure 2. Sample Procedure Hierarchy

Prior to beginning procedure development, a template for each procedure tier (policy, standard, procedure and work instruction) should be developed along with a process flowchart. Process standards and procedures typically contain the following sections:

- Purpose
- Scope
- Definitions and acronyms
- Roles and responsibilities
- Safety and health considerations
- Process (including flowchart) or procedure
- Record retention
- References
- Attachments
- Documentation control, including revision history
- Performance metrics (for process)

Figure 3 depicts the procedure development process that should be followed when developing process standards and procedures.
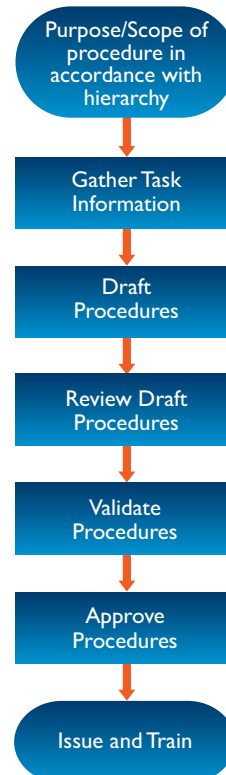
Figure 3. Procedure Development Process

Additionally, the following resources should be considered to be part of your documentation.

- Process descriptions
- Organization charts
- Specifications
- Drawings
- Production schedules

Creating a training program to support an operational discipline.

One process area or capability included as a best practice within the CMMI development quality model is a training capability. Once your operational discipline framework is established, processes are defined and procedures are developed, a standardized model of work is created and reinforced through training.

To ensure a comprehensive, successful training program, take a systematic approach, using performance-based training models as your guide. Effective training programs consider the size of an organization and the types of activities, the complexity of the processes and the background and qualifications of the personnel performing the tasks.

Similar to the development procedures, a performance-based training model follows the ADDIE(E) methodology, as shown in Figure 4.

ANALYSIS	■ Understand Skill and Knowledge Requirements
DESIGN	■ Develop Training to Close the Gaps
DEVELOPMENT	■ Develop the Training for the Optimal Delivery
IMPLEMENTATION	■ Apply the Training Across the Population
EXECUTION	☐ Ensure Optimal Quality of Training Delivery
EVALUATION	☐ Measure the Success of the Effort

Figure 4. ADDIE(E) Model

Analyzing the requirements of your training program.

As the first step of the training program, analysis identifies job tasks and the associated skills and knowledge required for a specific job position using both needs analysis and job/task analysis. Training needs are determined by surveying subject matter experts and job incumbents to determine which aspects of the job require training.

Using a tabletop analysis process involving both training and facility personnel will help you with both the analysis and the design phase of your training program. The tabletop analysis team generally consists of an instructional technologist from the training department to act as a facilitator for group activities, a subject matter expert, a job incumbent and a job supervisor, at minimum. This team will help identify tasks, make train/no train decisions and analyze the tasks necessary for skills and knowledge.

The team ensures that the task list is technically correct and complete, while also being instructionally sound. This effort ensures that no tasks are omitted from the task list and that the task statements are observable, measurable units of work that can serve as the basis for the training program.

Once the job analysis is complete, an evaluation is performed to identify what training courses or materials already exist to cover the tasks selected for training. Where training already exists, the material should be evaluated to determine whether the training material is sufficient or excessive, and then recommendations for modification should be made as appropriate. Where no training exists, further task analysis should be performed to ensure that all necessary skills and knowledge are addressed. In many cases, process standards, procedures and work instructions serve as the basis to develop training materials around.

This effort will streamline training to ensure that each person receives the learning necessary to perform his or her job, without extraneous instruction. This process also ensures that time is not spent analyzing tasks for which training already exists in sufficient detail.

The final products of the analysis phase include the following:

- A validated job task list
- Train/no train decisions
- A task analysis containing skill and knowledge statements for each task selected for training

Designing your training program to reinforce job tasks.

The design phase uses information collected during analysis to produce specifications for developing, implementing and evaluating the content and structure of the training program. Learning objectives are established based upon analysis results; the scope of training content is then defined. Systematically developed design specifications provide traceability to job and task performance requirements, thereby reinforcing program effectiveness.

Design phase activities include:

- Formation of learning objectives based upon the tasks, skills and knowledge statements gleaned from the analysis phase
- Development of examination items and job performance measures (JPMs) as appropriate for the objective/task being evaluated
- Selection of appropriate training venues. These settings will include, but not be limited to, classroom, laboratory, self-study, simulator, computer-based training (CBT) and on-the-job training (OJT)
- Creation of training program description and course maps

Developing materials to support your training.

During initial development, training materials are produced based upon learning objectives developed during the design phase. These materials include lesson plans, trainee study guides, test item banks, evaluation instruments such as visual aids and OJT materials. These development activities are guided by the program objectives but maintained within resource constraints.

Implementing your program.

The program implementation phase includes preparing instructional materials, assigning instructors and support staff and scheduling training and facilities. During implementation, qualified instructors conduct training and evaluate student performance. Lead instructors evaluate instructor performance.

Evaluating the results of your training program.

The key to long-term success of any training program is the implementation of an effective evaluation program. The evaluation program consists of both internal and external evaluations of each phase and product of the training program as well as the constant evaluation of information that could indicate a potential change to the training program content or requirements. Establishing performance metrics is a key part of the evaluation process.

Standard evaluation tools include the following:

- End-of-course evaluations by trainees
- Course evaluations by the presenting instructor
- Instructor evaluations
- Interviews and surveys of past trainees and trainees' supervisors
- Internal review and approval process for all training materials
- Review of:
  - Lessons learned
  - Procedure revisions for potential impact on training material
  - Equipment and facility modifications for potential impact on training material
  - Changes in equipment or equipment operations

Taking an integrated approach to achieve operational discipline.

The key to a world-class operational discipline is a structured, integrated approach that supports the success of your people, processes and technologies. Having established your operational discipline framework, and built the procedures, you can insert them into a "quality airplane," as shown in Figure 5, to create standard work.
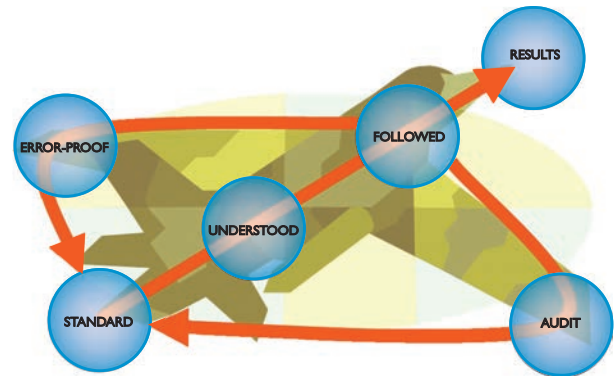

Figure 5. Quality Airplane – Integrated Approach

Training, mentoring and practice will ensure your conduct of operations is understood and put into consistent practice throughout the organization. Then auditing processes, including performance metrics, will help ensure the procedures are being followed and expected results are achieved.

About the Author

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