

**COS-3-02 / RP 75 4TH EDITION**

# **GUIDANCE FOR KNOWLEDGE AND SKILLS MANAGEMENT**

FIRST EDITION | MAY 2022



**SEMS AUDIT &  
CERTIFICATIONS**



**GOOD PRACTICE  
DEVELOPMENT**



**DATA COLLECTION,  
ANALYSIS & REPORTING**



**SHARING INDUSTRY  
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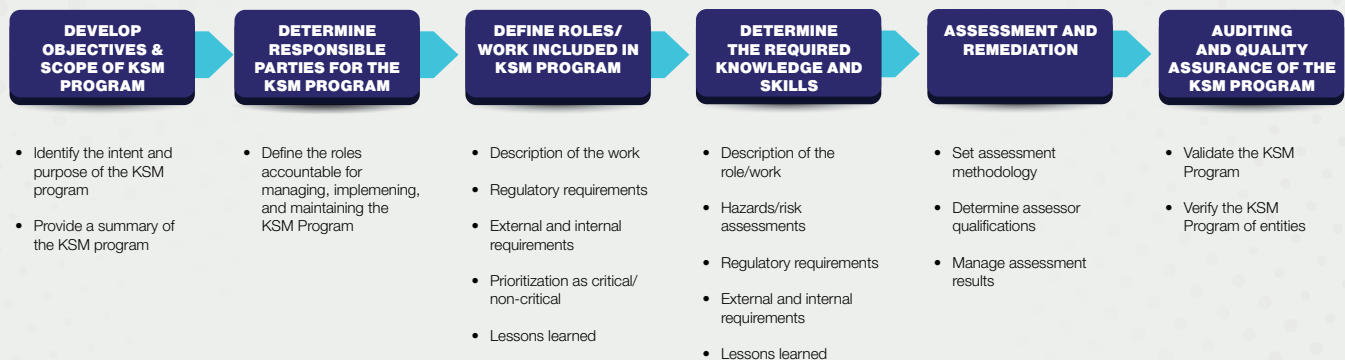
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# 1. PURPOSE

This Center for Offshore Safety (COS) publication is a guideline to help the oil and natural gas industry understand, develop, and implement an effective Knowledge and Skills Management Program (KSM Program or Program) based on company-specific needs. During the development of a company-specific Program, human performance should be considered. As part of an overarching management system, a KSM Program serves to control, in a systematic manner, a cycle of activities to establish, assess, and develop the knowledge and skills of identified individuals for successful performance of work. It is not the purpose of this document to provide prescriptive processes, practices, or procedures related to a KSM Program. This publication is intended for all activities involved in the oil and natural gas industry. Where applicable, interface documents may be used to align KSM Program requirements between a company and entities.

An effective KSM Program should have the following elements:

- Commitment and Objectives
- Overview and Scope
- Accountability and Responsibility
- Roles and/or Work
- Assessment and Remediation
- Auditing and Quality Assurance
- Records and Documentation



## 2. ACRONYMS

- **API** - American Petroleum Institute
- **BOP** - Blowout Preventer
- **BSEE** - Bureau of Safety and Environmental Enforcement
- **COS** - Center for Offshore Safety
- **USCG** - United States Coast Guard

## 3. DEFINITIONS

- **Knowledge & Skills Assessment** - A comprehensive, objective, and systematic evaluation of the minimum knowledge and skills necessary to perform a role and/or work.
- **Assessor** - A qualified person designated to perform an assessment.
- **Barrier** - A constraint on a hazard that reduces the probability of an incident or its consequences.
- **Component** (management system) - A policy, standard, practice, process, procedure, or control.
- **Entity** - An operator or contractor that performs work or provides facilities, services, equipment, supplies, or information for a Company or on a Company's asset.
- **Facility** - All types of structures permanently or temporarily attached to the seabed of the U.S. outer continental shelf (e.g., mobile offshore drilling units (MODUs); floating production systems; floating production, storage, and offloading facilities; tension-leg platforms; and spars) that are used for exploration, development, and production activities for oil, gas, and sulphur. This term includes pipelines regulated by the Department of Interior.
- **Remediation** - The process of correcting gaps identified in a knowledge and skills assessment.
- **Role** - A function assigned to a person.
- **Task** - Specified work undertaken by the workforce which is part of an activity identified in a company's KSM Program.
- **Verification** - The documented means of assuring that an assessment was performed in accordance with requirements.
- **Work** - An activity or task in offshore operations.



## 4.1 KSM PROGRAM ELEMENT - COMMITMENT AND OBJECTIVES

This element includes management's commitment to the KSM Program, identifies the intent and purpose of the program, and provides a clear description of its goals and objectives.

## 4.2 KSM PROGRAM ELEMENT - OVERVIEW AND SCOPE

This element provides a brief description of the KSM Program and its implementation and management components.

This element should summarize how the:

- Program is applied within a company
- Program is integrated with the company's other systems (if applicable)
- Company communicates the program
- Roles and/or work are identified and assigned
- Knowledge and skills are determined and delivered for each role and/or work
- Knowledge and skills are assessed (and remediated, if needed)
- Records and documentation are maintained
- Performance of the Program is measured to enable continuous improvement

## 4.3 KSM PROGRAM ELEMENT - ACCOUNTABILITY AND RESPONSIBILITY

This element lists the roles at all levels within the company that are accountable for managing, implementing, and maintaining the Program, identifying general responsibilities and levels of authority.

# 4.4 KSM PROGRAM ELEMENT - ROLES/WORK DEFINITION

Each company should define the roles/work included in the KSM Program and the associated knowledge and skills requirements.

The component can be divided into the following basic work:

- Define the roles/work for inclusion within the Program
- Determine the required knowledge and skills for defined roles/work
- Define the methods needed to acquire the required knowledge and skills (e.g., formal education, job-specific training, experience)

## 4.4.1. ROLES/WORK CONSIDERATIONS

Below are examples of criteria that a company may consider when defining roles/work for inclusion in the KSM Program.

### 4.4.1.1. Description of Work

The specific nature and conditions of work activities should be considered when describing roles/work. Examples include:

- Functional expertise for role (drilling, engineering, maintenance, etc.)
- Work description (e.g., a formation integrity test)
- Location of work (e.g., offshore, onshore)
- Type of facility (e.g., platform, floating production system, MODU)
- Types of operations (e.g., drilling, production operations, work over)
- Types of equipment/systems (e.g., cement unit, crane, software applications)

### 4.4.1.2. Regulatory Requirements

Roles/work specifically referenced in regulatory requirements should be considered for inclusion in the KSM Program. Examples include:

- Roles
  - Person-in-Charge (as defined by USCG)
  - Ultimate Work Authority (as defined by BSEE)
- Work
  - BOP testing
  - Safety valve testing



#### 4.4.1.3. External and Internal Requirements

If a company chooses to impose requirements beyond those defined by regulation, these requirements should be considered when defining the role/work to be included in the KSM Program. Examples of such requirements include:

- Standards and technical specifications issued by standards development and classification bodies
- Customer-specific requirements

#### 4.4.1.4. Lessons Learned

Lessons learned should be reviewed to identify if additional roles/work should be included in the KSM Program. These lessons can come from a variety of sources, both inside and outside the company, and may include:

- Incidents
- Audits
- Industry alerts and bulletins
- Performance history

## **4.2.2. KNOWLEDGE AND SKILLS CONSIDERATIONS**

After identifying the roles/work in Section 4.4.1 above, the company should define the components used to determine the knowledge and skills requirements for the roles/work included in the KSM Program.

#### 4.4.2.1. Description of Role/Work

The specific nature and conditions of the work should be considered when determining the required knowledge and skills for the included roles/work. Examples include:

- Role/work specific responsibilities (e.g., supervision, operation, monitoring)
- General responsibilities (e.g., stop work authority, emergency response)
- Location of work (e.g., offshore, onshore)
- Types of operations applicable (e.g., drilling, production operations, work over)
- Types of equipment used (e.g., cement unit, crane)

#### 4.4.2.2. Hazard and Risk Assessments

Hazard and risk assessments are important tools to identify the applicable barriers to prevent and/or mitigate incidents. The identified barriers may require individuals to possess specific knowledge and skills to ensure their strength, reliability, and effectiveness. Examples of how hazard and risk assessments may be used to determine knowledge and skills requirements include:

- Identifying specific activities required to maintain a barrier (e.g. operator rounds and testing)
- Identifying operating conditions that require specific knowledge and skills (e.g. respiratory hazards and weather)
- Identifying atypical operational conditions that require specialized training (e.g. emergency management, abnormal conditions, and new personnel onboard)

The KSM Program should clearly identify what knowledge and skills requirements apply to individual roles such that individuals in those roles can reliably perform barrier implementation and sustaining activities.

#### 4.4.2.3. Regulatory Requirements

Regulatory requirements associated with the defined role or work may specify the knowledge and skills of the person responsible.

#### 4.4.2.4. External and Internal Requirements

External and internal requirements associated with the defined role or work may specify the knowledge and skills of the person responsible.

#### 4.4.2.5. Lessons Learned

Lessons learned should be reviewed to identify if additional knowledge and skills requirements should be included in the KSM Program. These lessons can come from a variety of sources, both inside and outside the company, and may include:

- Incidents
- Audits
- Industry alerts and bulletins
- Previous performance history

#### 4.4.2.6. Prioritization of Roles/Work

Prioritization of roles/work into critical and non-critical categories is a recognized good practice associated with a risk-based approach towards incident prevention and/or mitigation. Critical is a term used to classify activities, facilities, processes, equipment, and, in this case, roles and work, that may be vital to the strength and reliability of the barriers that prevent or mitigate major incidents. Critical roles and work may be responsible for physical barriers (e.g., instrumentation and valves) or the elements that support the barriers (e.g., management of change and operating procedures). Identifying roles and work as critical may influence the frequency of the knowledge and skills assessments and verifications.

# 4.5 ASSESSMENT AND REMEDIATION

This element describes the methods and/or components used to evaluate, and if necessary, remediate, the knowledge and skills of individuals to assure successful performance of their roles and/or work according to company requirements.

Knowledge and skills assessment results should provide enough information to identify an action plan that may include supervision and managerial control or remediation (if applicable).

The assessment component can be divided into the following basic steps:

- Plan the assessment
- Conduct the assessment
- Provide feedback
- Record findings
- Plan and Execute remediation (if applicable)

## 4.5.1. ASSESSMENT CONSIDERATIONS

The assessment component should be based on factors that are specific to a company's work activities. Management support is key to a successful and effective assessment component. The factors listed below represent examples of criteria that a company may consider when developing an assessment component.

### 4.5.1.1. Assessment Tools and Methods

Assessments should aim to acquire performance-based evidence that an individual can successfully perform a role and/or work. The following are examples of different assessment tools and methods:

- Training and Certification Review
- Drill and/or Simulation
- Activity Observation
- Experience, Performance, or Work Product Review
- Peer Review
- Written, Oral, or Practical Examination

A company may consider the following when selecting assessment methods:

- **Location:** for many roles and/or work, an assessment of the individual in their particular work environment may provide a better opportunity to perform a realistic assessment.
- **Consistency:** assessments should be structured such that different assessors would be likely to generate similar results for a given assessment.
- **Risk:** the assessment method and the level of evidence collected should be commensurate to the criticality of the assessed role and/or work.

#### 4.5.1.2. Assessor Qualifications

Qualified assessors are an important part of an effective assessment component. The KSM Program should have a component for determining assessor qualifications. Assessors may be dedicated to the assessment component or may perform this function as part of their primary job function (e.g., supervisor, trainer). To assure the consistency of assessments, a company should consider developing a protocol for assessors that includes assessment guidance. The following criteria should be considered in identifying assessors:

- Experience
- Training
- Knowledge and Skills
- Impartiality
- Credibility

#### 4.5.1.3. Feedback Component

Feedback is an important tool to reinforce desired knowledge and skills. The individual being assessed should receive prompt, accurate, and constructive feedback from the assessor.

#### 4.5.1.4. Frequency

Assessment frequencies should be established according to criteria defined by the company. One of the more commonly accepted methods for setting assessment frequency utilizes a risk-based approach with higher risk work being assessed more frequently than those deemed lower risk. In addition, a company's KSM Program should consider the following when establishing assessment frequencies:

- Assignment to new roles and/or work
- Re-assessments following remediation of identified gaps
- Non-routine, infrequent, and emergency situations
- Critical roles

#### 4.5.1.5. Managing Assessment Results

The assessment component determines if the evaluated individual has the required knowledge and skills for the specific role and/or work. Individuals that do not meet the requirements should be subject to remediation per the company's KSM Program.

## 4.5.2. REMEDIATION

A KSM Program should include a component to address gaps identified during an assessment. Gaps may be the result of deficiencies at the individual and/or management system levels. An evaluation should be made to identify the level at which gaps are present so that appropriate corrective actions can be taken.

### 4.5.2.1. Individual Gaps

If an individual is found to have a knowledge and/or skills gap, remedial action should be considered. Upon completion of the remedial actions, the company should reassess the individual. Examples of remedial actions include:

- Additional training (e.g., classroom, simulations)
- Coaching/Mentoring

### 4.5.2.2. Management System Gaps

Where the assessor finds management system gaps, the company should take remedial action in a timely manner. Examples of remedial actions include:

- Revising training requirements to address identified gaps
- Assuring roles and/or work are properly identified
- Ensuring company supervision levels are appropriate for a given role and/or work
- Updating equipment and/or procedures

## 4.6 KSM PROGRAM ELEMENT - AUDIT AND QUALITY ASSURANCE

This element describes the component used to assure a company's KSM Program is suitable, adequate, and effective. The component should include steps to validate the Program, and may include:

- Auditing the Program
- Reviewing employee records related to worker knowledge and skills
- Reviewing employee records prior to starting work
- On-site verifications

This component should also define the components used to validate that assessors have effectively and consistently applied the assessment component, and that assessment records are valid, accurate, and complete. Verification should be performed by an individual:

- Qualified in accordance with a company's program, and
- Who did not perform the assessment being verified.

If a company uses entities to fulfil roles and/or work included in its KSM program, the company should periodically verify the program of the entity(s) is suitable, adequate, and effective. This verification may be performed as part a company's entity management component.

## 4.7 KSM PROGRAM ELEMENT - RECORDS AND DOCUMENTATION

This component describes the process for managing the KSM Program records and documentation, which may include:

- Component(s) for implementing, maintaining, and managing the Program
- Documents and forms necessary for providing verification of these policies and procedures
- Training and Assessment records
- Assessor qualification records
- Audit and Quality Assurance reports

The company's documentation control component should also address the following:

- Location of records
- Format of records
- Retention requirements

