

FFPO Procedure Blue Sheet Form

A. Procedure Title (list manual, procedure series, or specific procedure #)

SPR Accident Prevention Manual

Section 7 Process Safety Management (PSM)

B. Procedure Name/series type (i.e., operations, maintenance, etc.) E S & H

C. Check (✓) one of the following:

1. Procedure(s) accepted “as is” with terminology replaced as denoted in the Site Procedures Approved Terminology Replacement List for the FFPO SPR M&O contract.

2. In addition to the changes in approved terminology for the FFPO SPR M&O contract, improvements to the procedure are warranted:

Category 1 Finding (Resolution prior to contract start)

Category 2 Finding (Resolution within 90 days of contract start)

Category 3 Finding (Resolution to the Issues Management program)

D. Comments/Notes:

E. Forward a copy of this form to the FFPO Director, Business Management for revision tracking.

Signed

FFPO Reviewer Signature

02/25/14

Date

Steve Mahan

FFPO Reviewer Print Name

Site Procedures Approved Terminology Replacement List

Approved Terminology Replacements	
Terminology to be Replaced	Substituted Verbiage
AGSC	M&O Contractor or MOC
Boeing	M&O Contractor or MOC
Construction Management Services or CMS contractor	M&O Contractor or MOC
DynMcDermott or DM or Company	M&O Contractor or MOC
DM Contract No.	M&O Contract
Organizational Changes	
William Gibson or "Hoot"	DOE Project Manager or DOE PM
Robert (Bob) McGough or DM Project Manager or CEO	MOC Project Manager or MOC PM
Randy Sutton (Acting) or DM General Counsel	MOC General Counsel or MOC GC
Scott Landry or DM APM, O&M and COO	MOC APM, O&M
APM, Cavern Integrity	Senior Director, Cavern Integrity
Colleen Yates or DM APM, Business Operations and CFO	MOC APM, Business Operations and CFO
APM, Security and Emergency Preparedness or Director, Security and Emergency Preparedness Division	Senior Director, Security & Emergency Preparedness
Henry Schmidt, Jordan Jones, or Duane Johnson	Senior Director, Security & Emergency Preparedness
Leslie Williams or APM, Data Systems or Data Systems Director	Senior Director, Data Systems
William Bozzo or DM APM, ES&H	MOC APM, ES&H
Walt Newcomb or DM Director, Energy & Sustainability	Director, Environmental
J.P. Martinez or DM APM, Engineering	MOC APM, Engineering

ACRONYMS

- AGSC ASRC Gulf States Constructors
- APM Assistant Project Manager
- ASRC Arctic Slope Regional Corporation
- CAS Contractor Assurance System
- CFO Chief Financial Officer
- COO Chief Operating Officer
- ES&H Environment, Safety, and Health
- GC General Counsel
- M&O Management and Operating
- MOC Management and Operating Contractor
- O&M Operations and Maintenance
- PM Project Manager

7. PROCESS SAFETY MANAGEMENT (PSM)

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7.1. INTRODUCTION

The SPR is required to comply with 29CFR1910.119, “Process Safety Management of Hazardous Chemicals (PSM),” because we store, handle, and move a flammable liquid (crude oil) in quantities of 10,000 pounds or more and the crude oil is stored under pressure. This section provides the requirements for implementing Process Safety Management (PSM) at the Strategic Petroleum Reserve (SPR) and includes information on all applicable requirements in 1910.119 and 1926.64.

Of the listed chemicals in the standard, the SPR only meets the criteria for crude oil. PSM requirements are consistent with and support Integrated Safety Management.

7.2. PSM REQUIREMENTS

The purpose of our PSM program is to prevent the occurrence, and minimize consequences, of significant releases of toxic substances, as well as fires, explosions, and other types of catastrophic accidents. Overall, PSM prevents fatalities, injuries and illnesses, and avoids physical property damage. Activities required under PSM are outlined below.

7.2.1. Employee Participation (1910.119(c))¹

- a. Develop a written employee participation plan for each operating site.
- b. Consult with employees on the conduct and development of process hazards analyses and on the development of the other elements of process safety management.

¹ ISM Core Function 5. “Provide Feedback and Continuous Improvement.

- c. Provide employees with easy access to process hazard analyses and all other information developed under this standard.

7.2.2. Process Safety Information (1910.119(d))²

- a. Compile written process safety information before conducting any process hazard analysis. Written process safety information must be presented in a way that allows employees involved in the process to identify and understand hazards posed by the process.
- b. Information to be collected will include at least the following:
 - 1. Toxicity information,
 - 2. Permissible exposure limits,
 - 3. Physical data,
 - 4. Reactivity data,
 - 5. Corrosivity data,
 - 6. Thermal and chemical stability data,
 - 7. Hazardous effects of unintended mixing of different materials.
- c. Information on the process will include at least the following:
 - 1. A block flow diagram or other simple process flow diagram,
 - 2. Process chemistry,
 - 3. Maximum intended inventory,
 - 4. Safe upper and lower limits for temperature, pressures, and flows of compositions,
 - 5. An evaluation of the consequences of process deviations that could affect the safety and health of employees.
- d. Information pertaining to the process equipment will include:
 - 1. Materials of construction,
 - 2. Piping and instrumentation diagrams,
 - 3. Electrical classification,
 - 4. Relief system design and design basis,
 - 5. Ventilation system design,
 - 6. Design codes and standards,
 - 7. Material and energy balances,
 - 8. Safety systems.
- e. Document that equipment complies with good engineering practices.
- f. For equipment designed and installed according to standards no longer in effect, determine and document that the equipment is being operated and maintained in a safe manner.

7.2.3. Process Hazard Analysis (1910.119(e))³

- a. Perform an initial Process Hazard Analysis on the processes covered by the standard for all operating sites. Analyses may use “what-if” checklists, Hazard and Operability Study (HAZOP), Failure Modes and Effects Analyses, fault trees, or similar methodologies. Written process safety information must be sufficient to allow employees involved in the process to identify and understand the hazards posed by the process.
- b. The Process Hazard Analysis will address:
 - 1. Any previous incident that had significant potential to cause catastrophic consequences in the workplace,

² ISM Core Function 1. “Define the Scope of Work.”

³ ISM Core Function 2. “Analyze the Hazards”

2. Engineering and administrative controls applicable to the hazards identified,
 3. Consequences of failure of engineering and administrative controls,
 4. Facility siting,
 5. Human factors,
 6. A qualitative evaluation of the possible safety and health effects of controls failure.
- c. Perform the Process Hazard Analysis with a team of employees who have expertise in engineering and process operations in general, as well as employees who are experienced and knowledgeable about the operation and maintenance of the specific process. The team should also include an instrumentation and control technician, as well as someone knowledgeable about the analysis methodology being used.⁴
 - d. Identify and document process hazards and recommend corrective actions.⁵
 - e. Establish a system to promptly address the team's findings.
 - f. Update and revalidate the Process Hazard Analysis every 5 years after completion of the initial hazard analysis.
 - g. Retain process hazard analyses and updates for the life of the process.

7.2.4. Operating Procedures (1910.119(f))⁶

- a. Develop and implement written operating procedures for safely conducting activities involved in the process, including steps for:
 1. Initial startup,
 2. Normal operations,
 3. Temporary operations,
 4. Emergency shutdown,
 5. Emergency operations,
 6. Normal shutdown,
 7. Startup following a shutdown,
 8. Operating limits – consequences of deviation and steps required to correct,
 9. Cautions and warnings about safety and health considerations,
 10. Properties and hazards of the chemicals used, precautions necessary to prevent exposure, and control measures if an exposure occurs,
 11. Quality control for chemical inventory levels,
 12. Any special or unique hazards,
 13. Safety systems and their functions,
 - a) Ensuring operating procedures are readily accessible to employees,
 - b) Reviewing operating procedures as often as necessary to ensure they are current,
 - c) Certifying operating procedures annually as current and accurate,
 - d) Developing and implementing safe work practices, such as lockout/tagout, confined spaced entry, hot work, access control, etc.

⁴ ISM Core Function 5. "Feedback and Improvement" and Employee Participation

⁵ ISM Core Function 3. "Develop and Implement Hazard Controls"

⁶ ISM Guiding Principles 2, "Clear Roles and Responsibilities," 5, "Identification of Safety Standards and Requirements;" and 6, "Hazard Controls Tailored to Work Being Performed;" and Core Function 4, "Perform Work within Controls."

7.2.5. Training (1910.119(g))⁷

- a. Initial training:
 1. Provide initial training to each employee involved in operating a newly assigned, or significantly changed, process before they operate the process. Training must include:
 - a) An overview of the process and operating procedures,
 - b) An emphasis on safety and health hazards,
 - c) An emphasis on emergency operations (including shutdown),
 - d) Safe work practices applicable to the employee's job tasks.
- b. Refresher training:
 1. Provide refresher training at least every three years and more often if necessary to each employee involved in operating a process.
 2. With feedback from the employees involved in operating the process, determine the appropriate frequency of refresher training.
- c. Training documentation:
 1. Ensure training is performance-based, i.e., requiring some demonstration of skill or knowledge.
 2. Prepare a record containing the identity of the employee, the date of training, and the means used to verify that the employee understood the training. A Training Activity Attendance Report (TAAR) is used to document attendance.

7.2.6. Contractors and Subcontractors (1910.119(h))⁸

The requirements that apply to construction and service subcontractors and other contractors performing maintenance or repair, turnaround, major renovation, or other work on or adjacent to a covered process can be found in tables at the end of this section.

7.2.7. Pre-Startup Safety Review (1910.119(i))⁹

- a. DM will perform a pre-startup review for new facilities or facilities which have undergone significant modification.
- b. Confirm that prior to introducing hazardous chemicals to the process:
 1. Construction and equipment meets design specifications,
 2. Adequate safety, operating, maintenance, and emergency procedures are in place,
 3. A Process Hazard Analysis has been performed and recommendations have been resolved,
 4. Training requirements have been met.

7.2.8. Mechanical Integrity (1910.119(j))¹⁰

- a. Establish and implement written procedures for maintenance.
- b. Provide maintenance personnel with training that includes an overview of the process and its hazards, as well as of procedures applicable to the employee's tasks.
- c. Inspection and Testing:

⁷ ISM Guiding Principle 3, "Competence Commensurate with Responsibility."

⁸ DEAR Clause 48CFR970.5204-2 requirement to flow down ISM to subcontractors.

⁹ ISM Guiding Principle 7. "Operations Authorization."

¹⁰ ISM Core Function 4. "Perform Work within Controls."

1. Perform inspections and tests that follow recognized and generally accepted engineering practices on process equipment.
 2. Comply with the manufacturers' recommendations for the frequency of inspections/tests and inspect more frequently if deemed necessary based upon operating experience.
 3. Document each inspection and test, including:
 - a) date of inspection,
 - b) name of person performing inspection,
 - c) serial number or other identifier on the equipment tested,
 - d) description of the type of inspection or test, and
 - e) results.
 4. Correct equipment deficiencies before further use or in a safe and timely manner.
- d. Quality Assurance:
1. Assure that fabricated equipment is suitable for the process application.
 2. Perform appropriate checks and inspection to assure that equipment is properly installed.
 3. Assure that maintenance materials, spare parts, and equipment are suitable for the process application.

7.2.9. Hot Work Permit (1910.119(k))¹¹

- a. Issue a Safe Work Permit (SWP) for hot work operations conducted on or near the covered process, documenting that fire prevention and protection requirements as found in ASL5480.18, Fire Protection Manual, Section 13.1.6, are completed prior to the start of hot work operations. Documentation must include:
 1. the date authorized for hot work,
 2. serial number or other identifier of the object on which hot work is performed,
 3. hazard controls, and
 4. required PPE.
- b. The permit must comply with the requirements stipulated in APM Section 35.3, and must be kept on file until the work is completed.

7.2.10. Management of Change (1910.119(l))

- a. Establish and implement written procedures to manage changes to process chemicals, technology, equipment, and procedures, as well as changes to facilities that affect the covered process.
- b. Written procedures will not apply to replacements in kind.
- c. Procedures shall address the technical basis for the change, impact of the change on safety and health, modifications necessary to operating procedures, the time period for the change, and authorization requirements for the proposed change.
- d. Inform employees and subcontractors who operate and maintain the process of the change.
- e. Provide employees and others with any necessary training prior to them working on the changed equipment, facility, etc.
- f. If a change requires revision or creation of operating procedures, this must be done prior to operating the changed process.

¹¹ ISM Guiding Principles 6, "Hazard Controls Tailored to Work Being Performed;" and 7, "Operations Authorization. Core Function 4. "Perform Work within Controls."

NOTE

This applies to organizational and budget changes

7.2.11. Incident Investigation (1910.119(m))¹²

- a. Investigate any incident that resulted in, or could have reasonably resulted in, a catastrophic release of crude oil not later than 48 hours following the incident.
- b. Assign an accident investigation team, composed of one person knowledgeable in the process, a subcontract employee (if the incident involved subcontractor work), and other persons with appropriate expertise and experience.
- c. Prepare an accident report that includes the date of the incident, the date the investigation began, a description of the incident, contributing factors, and recommendations.
- d. Document and resolve corrective actions.
- e. Review the report with all affected personnel, whose job tasks are relevant to the incident, including subcontract employees, when applicable.
- f. Retain investigation report for at least five years.

7.2.12. Emergency Planning and Response (1910.119(n))

- a. Establish and implement an Emergency Action Plan in accordance with 29CFR1910.38(a) and 1910.120. The plan will also include procedures for handling small releases.
- b. The Emergency Action Plan addresses what actions our employees are to take when there is an unwanted release of highly hazardous chemicals.
- c. Our Emergency Action Plan is located in each storage site's Emergency Response Procedures.

7.2.13. Compliance Audits (1910.119(o))

- a. Assess site compliance with the PSM standard every three years.
- b. Certify that DM procedures and policies are adequately compliant.
- c. Report the audit findings.
- d. Document responses and closure of findings.
- e. Retain the two most recent compliance audit reports.

7.2.14. Trade Secrets (1910.119(p))

- a. The SPR has no trade secrets.

¹² ISM Core Function 5. "Provide Feedback and Continuous Improvement."

7.3. TABLES: PROCESS SAFETY MANAGEMENT

TABLE 7.1. PROCESS SAFETY MANAGEMENT RESPONSIBILITIES	
Position or Department	Responsibility
DM Petroleum	a. When selecting a contractor, obtain and evaluate information regarding the subcontractor’s safety performance and programs. b. Inform subcontractor employees of the known potential for fire, explosion, or toxic release hazards related to the subcontractor’s work, as well as potential hazards. c. Explain the emergency action plans – i.e., alarms, evacuations, expected response, and return to work. d. Control the entrance, presence, and exit of contract employers and contract employees in process areas. e. Require all subcontractors and their employees working at the facility to follow the safe work practices established by DM. f. Evaluate the performance of subcontractor supervision of their employees. g. Require the subcontractor to maintain a subcontract employee injury and illness log on site.
Contractor and Subcontract Employer Responsibilities	a. Certify that each subcontract employee is trained as needed to perform his/her work safely. b. Document that each subcontract employee has received and understood training in the known potential fire, explosion, or toxic release hazards related to his/her job and the process, including the applicable emergency action plans. c. Maintain a training record: identity of the subcontract employee, date of training, and means used to verify that the employee understood the training. d. Ensure that subcontract employees follow the safety rules of the DM facility. e. Advise DM of any unique hazards presented by their work. f. For construction subcontractors, maintain compliance with 1926.64 regarding any requirements not covered in this section.

TABLE 7.2. PSM POSITIONS AND RESPONSIBILITIES	
Position or Department	Responsibility
Project Manager	a. Ensure that DM has policies and procedures in place to comply with 29CFR1910.119 and 29CFR1926.64.
Site Director	a. Ensure that the site complies with the requirements of PSM. b. Ensure that employees are appropriately trained for their job tasks and responsibilities prior to operating or maintaining the crude oil and related processes. ¹³ c. Ensure that all subcontractors working on their site follow the required PSM policies and procedures as defined in this section. d. Ensure that pre-startup safety reviews (or Readiness Reviews) are performed for new facilities and processes of facilities and processes

¹³ Guiding Principle 3.

TABLE 7.2. PSM POSITIONS AND RESPONSIBILITIES

Position or Department	Responsibility
Operations and Maintenance (O&M)	<p>which have undergone significant modification.</p> <ol style="list-style-type: none"> a. Ensure operating procedures are accessible to employees at all times b. Ensure all operators and maintenance personnel receive initial training before operating or maintaining a new or significantly changed operation, equipment, or facility. c. Ensure all operators and maintenance personnel receive refresher training at prescribed intervals. d. Ensure maintenance personnel’s training includes an overview of the process and its hazards, as well as procedures applicable to the employee’s tasks. e. Do not allow employees without required training to operate or maintain process equipment. f. Establish and implement written maintenance procedures. g. Perform inspections and tests as required by 7.2.8. h. Correct equipment deficiencies before further use or in a safe and timely manner. i. Use and maintain a hot work permit system meeting the requirements outlined in this APM. j. Take prompt action to implement any corrective actions resulting from an accident/incident investigation as described in 7.2.11.a. k. Review accident/incident reports with all affected personnel. l. Establish and implement emergency action plans.
Engineering	<ol style="list-style-type: none"> a. Configuration control. <ol style="list-style-type: none"> 1. Establish and implement written procedures for managing changes to process chemicals, technology, equipment, procedures, as well as changes to facilities that affect the covered process as specified in 7.2.10. b. Electrical engineering. <ol style="list-style-type: none"> 1. Review the electrical operating procedures as often as necessary to assure that they are current. 2. Certify annually that electrical operating procedures are accurate and current. c. Engineering design. <ol style="list-style-type: none"> 1. Ensure that process equipment complies with good engineering practices. 2. For equipment designed and installed according to standards no longer in effect, determine and document that the equipment is being operated and maintained in a safe manner. d. Process engineering. <ol style="list-style-type: none"> 1. Consult with employees on the conduct and development of process hazards analyses and on development of the other PSM elements. 2. Compile written process safety information as described in 7.2.2, prior to process analyses. 3. Determine whether equipment complies with good engineering practices, and document findings. 4. Appoint a team of employees as described in 7.2.1.

TABLE 7.2. PSM POSITIONS AND RESPONSIBILITIES

Position or Department	Responsibility
	<ol style="list-style-type: none"> 5. Lead Process Hazard Analyses (PHAs) on any new or significantly changed process equipment, facilities, etc. 6. Assure that PHAs meet the requirements of 7.2.3. 7. Implement a system to track PHA recommendations to closure, in accordance with this manual. 8. Update and revalidate the PHAs every 5 years. 9. Develop and implement written operating procedures that cover the activities listed in 7.2.4. 10. Review the mechanical operating procedures as often as necessary to assure that they are current. 11. Certify by signature that mechanical operating manuals are accurate and current. 12. Conduct pre-startup reviews when any facility, process equipment, or process procedures are introduced or significantly modified. 13. Prior to introduction of hazardous chemicals to the process, confirm all requirements have been met. 14. Review annual budget changes for potential impacts to Process Safety
Procurement and Contracts	<ol style="list-style-type: none"> a. For DM construction subcontracts, obtain and evaluate information on a potential subcontractor’s safety performance and programs when selecting a subcontractor. b. Take effective action when a subcontractor fails to comply with contractual or legal requirements.
Quality Assurance	<ol style="list-style-type: none"> a. Ensure that fabricated equipment is suitable for the process application. b. Perform appropriate checks and inspections to assure equipment is properly installed. c. Assure that maintenance materials, spare parts, and equipment are suitable for the process application. d. Maintain the Action Tracking System (ATS), which tracks assessment and accident investigation corrective actions.
Professional Development	<ol style="list-style-type: none"> a. Assess training performance at least once a year for conformance with 7.2.5 requirements. b. Require that training associated with operating and maintaining the crude oil process be performance-based. c. Ensure that employees involved in operating and maintaining the process participate in determining the appropriate frequency of refresher training. d. For New Orleans personnel, maintain training records containing at minimum: the identity of the employee, date of training, and means used to verify the employee understood the training. e. Assess site-maintained training records for compliance.
Site ES&H Manager	<ol style="list-style-type: none"> a. Act as the PSM Coordinator for the site. b. Maintain a site specific written employee participation plan and document roadmap in accordance with the DM_Process Safety Management Employee Participation Implementation Plan. c. Ensure ready access to process hazard analyses and all other PSM

TABLE 7.2. PSM POSITIONS AND RESPONSIBILITIES

Position or Department	Responsibility
	information at all times. d. Provide input to the development and implementation of safe work practices including, but not limited to, lockout/tagout, confined space entry; excavation; hot work; access control, etc.
Site Safety Specialist	a. Provide input to the development and implementation of safe work practices including, but not limited to, lockout/tagout, confined space entry; excavation; hot work; access control, etc. b. Provide safety and health oversight and support of site operations and maintenance, including at least a biweekly inspection. c. Assist Construction Management with safety and health oversight and orientation of subcontractors, as needed.
Site Training/Continuous Quality Improvement	a. Maintain training records that fulfill the requirements in 7.2.5.
New Orleans Safety and Health	a. During audits, verify that subcontract employees have been trained as certified to perform their work safely. b. Establish and implement written procedures for compliance with PSM requirements. c. Establish and implement written procedures for hot work and other safety practices and controls. d. During audits, verify that the requirements of this section are being met. e. Establish and implement incident investigation procedures. f. Investigate any accident or incident that could have caused a catastrophic release within 48 hours of occurrence. g. Assign and lead an accident investigation team meeting the requirements in 7.2.11.b. h. Prepare an accident report meeting the requirements in 7.2.11.c. i. Establish a system to document and track corrective actions resulting from an incident/accident investigation. j. Retain copies of the investigation report for at least five years. k. Assess site compliance with the PSM standard every three years. l. Certify that DM procedures and policies are adequately compliant or initiate corrective action. m. Report PSM assessment findings to DM management. n. Document and track to closure PSM assessment findings. o. Retain the two most recent PSM assessment reports, at minimum. p. Write the initial edition of the employee participation plan and roadmap to PSM documents.
Contractors and Subcontractors	a. Certify that each subcontractor employee is trained as needed to perform his/her work safely. b. Document that subcontractor employees have received and understood training in the known hazards related to his/her job, the process, and emergency action plans. c. Maintain employee training records meeting the requirements of (1910.119(h)) d. Ensure that subcontractor employees follow all safety policies and procedures.

TABLE 7.2. PSM POSITIONS AND RESPONSIBILITIES

Position or Department	Responsibility
	<ul style="list-style-type: none"> e. Advise DM of any unique hazards presented by the subcontractor’s work. f. Comply with the requirements of 1926.64 for any additional requirements not covered in this section.
<p>Construction Management</p>	<ul style="list-style-type: none"> a. Evaluate information regarding the subcontractor’s safety performance and programs when selecting a potential subcontractor. b. Verify that subcontractor employees have been informed of the potential process hazards for any system on which they will be working or within close proximity to their workspace. c. Verify that subcontractor employees have been briefed on emergency action plans. d. Ensure that site access by subcontract employees is controlled. e. Require all subcontractors, their employees, and lower tier subcontractors working at an SPR facility to follow the safety work practices established by DM, or their own programs if approved by DM S&H. f. Evaluate the adequacy of subcontractor supervision and provide feedback to S&H and Procurement. g. Require the subcontractor to maintain a readily accessible log of employee injuries and illness. h. Review accident/incident reports with subcontract employees when applicable.