

**CALENDAR ITEM  
136**

A 54

06/23/11

W 40821.2

W 17165

S 27

M. Steinhilber

**CONSIDER THE SCOPE OF WORK FOR  
IMPLEMENTATION AND COMPLETION OF AN ENVIRONMENTAL  
PROTECTION AND FACILITY SAFETY AUDIT FOR THE  
LONG BEACH UNIT, WILMINGTON OIL FIELD,  
LOS ANGELES COUNTY**

**BACKGROUND:**

At its April 28, 2011 public meeting, pursuant to Chapter 941 of the Statutes of 1991 (Chapter 941) and the Agreement for Implementation of an Optimized Waterflood Program (OWPA), the California State Lands Commission (Commission) reviewed the Long Beach Unit Program Plan (July 1, 2011 through June 30, 2016) and determined that the Program Plan as a stand-alone document did not include sufficient detailed information on the safety and environmental programs for the Long Beach Unit to find that it does not involve any significant environmental or safety risk. Based upon this determination, the Commission by letter dated April 28, 2011 (Exhibit A, attached hereto) ordered the Long Beach Unit Program Plan to be revised to include an environmental and safety review and assessment of the Long Beach Unit operations to be completed within 15 months.

Further, the Commission directed staff to return to the Commission within 60 days with a detailed scope of the environmental and safety review and assessment, which, at a minimum, would include an identification and analysis of environmental and safety risks that could lead to potential human injury, an adverse environmental impact, or significant property damage, and recommendations to improve the operations and Program Plan to address any identified risks. The Commission also directed that the review and assessment be funded in a manner not to impact net revenues to the State's General Fund.

This calendar item presents the scope of the Environmental Protection and Facility Safety Audit (Exhibit B, attached hereto) recommended by Commission staff and reviewed with and agreed to by the City of Long Beach and Occidental Long Beach, Inc. (OLBI).

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The Mineral Resources Management Division (MRMD) conducts, as a component of its facility oversight and surveillance program, Safety and Oil Spill Prevention Audits of its Offshore Oil and Gas Lease platforms and related onshore facilities on a five year periodic basis, in accordance with industry guidelines and federal regulations for process safety management. The audits are a comprehensive evaluation of offshore platforms and supporting onshore facilities, which augments the ongoing Commission monthly facility inspection program. Audits consist of physical inspections and technical evaluations of systems, equipment, and programs that are impracticable to inspect on a monthly basis. The objective of the Safety and Oil Spill Prevention Audit (Safety Audit) program is to ensure that oil and gas production facilities are operated in a safe and environmentally sound manner and comply with federal, state and local codes, regulations, and permits governing facility operation and pollution prevention, as well as industry best practices and standards.

The value of these evaluations and the importance of the safety audit program itself are reinforced by the fact that nearly all State offshore drilling and production facilities were designed and installed over 45 years ago. The design standards used at that time, and the alarm and control equipment installed, have since been revised and upgraded. Many of the facilities have undergone major design changes to accommodate production expansions or new production and processing methods, and companies other than the original operator now operate all the facilities. In the last decade, facility audits have resulted in more than five thousand action items, all of which have been corrected or are in the process of being corrected. Correction of action items arising out of each Safety Audit represents a major achievement in improving safety and preventing pollution.

In 2002, Commission engineering staff completed a comprehensive facility safety audit of the Long Beach Unit as a condition of the Commission's approval of the contractor assignment from ARCO to Oxy Long Beach, Inc. Because that audit occurred nearly 10 years ago, Commission staff believes that another safety audit is timely and could provide further safety and environmental enhancements.

The Environmental Protection and Facility Safety Audit for the Long Beach Unit will be conducted by the six SLC Mineral Resources Management Division (MRMD) engineers, including the supervisor of the MRMD Safety Audit unit. It is anticipated that two personnel from the City of Long Beach and four personnel from OLBI will also participate, on a limited basis, to support or monitor the audit activities. The audit will cover five functional areas: Equipment Functionality and Integrity (EFI), Technical (TEC), Electrical (ELC), Administrative (ADM), and Human Factors (HF). An outside electrical consultant will need to be retained for

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the electrical portion of the audit. The MRMD staff will work as one team on some phases of the audit and will break into two or three teams for other parts of the audit in order to maximize efficiency. During the audit, the teams will work sequentially, simultaneously, or collaboratively as needed. A list of acronyms is provided at the end of the calendar item for convenience in understanding the terms and references used in the calendar item.

Throughout the Safety Audit, the MRMD teams will confer, as required, with points of contact in OLBI Operations, Engineering, Health and Safety, and Maintenance. City of Long Beach and OLBI representatives may participate as team members on each of the first four teams. An independent licensed Electrical Engineer with experience with oil and gas production facilities will be required to conduct the electrical portion of the Safety Audit. An OLBI company electrician will be required to provide access to panels and equipment for the Electrical Engineer's site work. Identification of appropriate points of contact and participants will be determined in advance during preparatory meetings.

Team activity at the islands and onshore facilities will be frequent during the initial stages of the audit. Review of the safety system design and other technical and plan evaluations and preparation of the final report will be conducted at MRMD offices in the later stages.

The work flow of the audit will generally take the following course. First the EFI team will check the Process and Instrumentation Diagrams (P&ID's) for the island and onshore facilities onsite for accuracy and currency. The P&ID's provide diagrams in schematic form of the arrangement and specifications of all vessels, tanks, piping, valves, and alarm and control sensors at each facility, and must be checked for accuracy before a technical evaluation of the adequacy of the pollution prevention alarm and control system can be conducted. Following onsite verification of the P&ID's, the TEC team will conduct a technical analysis of the pollution prevention alarm and control safeguards, including the Emergency Shutdown System (ESD), to verify its adequacy to prevent pollution and its compliance with applicable regulations and codes. Safety devices, controls, and detection sensors will be reviewed along with the logic, failsafe features, system installation, and design standard adherence. Issues identified by the EFI team will be researched and evaluated, including the design standards applied and material and equipment specifications. The EFI team will inspect the physical condition of vessels, tanks, piping, and other equipment during this phase, and any problems or maintenance needs will be recorded. The EFI team will also research equipment specifications, and maintenance and internal inspection records of tanks, vessels, piping, and other equipment to verify fitness for service and note maintenance or inspection needs. All safety systems and equipment, such as the firefighting system, gas detection, and other

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systems, will be thoroughly inspected in the field using checklists for maintenance, fitness, and compliance with appropriate standards. Spill response equipment will also be inspected and inventoried. Any problems found regarding conformance of operations with the various operations manuals, emergency response plans, operating procedures, and other required regulatory plans will be addressed and may be referred to the ADM team for further review. The ADM team will review and evaluate the Facility Operating Manual, the Spill Contingency Plan, maintenance programs, operator training and qualification programs, safe work practices, management of change, investigation of incidents, internal auditing, the use and updating of operating procedures, and other OLB I job safety and pollution prevention programs and note any discrepancies.

An outside electrical contractor will be employed for the ELC phase of the audit. The ELC team will evaluate the physical condition of the facility's electrical power distribution system, electrical equipment, electric or electronic controls, and the operation, state of maintenance, and fitness for service of these systems. The ELC team will review the electrical drawings, such as the one-line diagram of the electrical power distribution system and the hazardous area classification diagrams for compliance with the National Electrical Code.

The HF team typically conducts its work after completion of the field work and technical reviews and assessments of the EFI, TEC, and ADM teams. The HF team will conduct a Safety Assessment of Management Systems (SAMS) procedure, which assesses organizational safety culture, and the level of maturity of safety programs through a series of confidential interviews with a cross-section of operators, engineers, management, and contractors. A series of questions in seven areas of safety and pollution prevention management are discussed during the interviews. The HF team will prepare a confidential report considering all interview responses that ranks the relative strength and maturity of the organization in the seven safety culture areas. The ranking reveals the strengths and weaknesses in the corporate safety and pollution prevention programs. It is a tool that addresses human error factors and can be used to improve programs to reduce human error and improve safety culture.

Regularly scheduled monthly status meetings will be held to review the progress and results of the teams. These meetings will include updates on the action items identified during the safety audit. OLB I will be provided with a matrix of these items and may question or resolve any identified action items immediately.

The MRMD team will prepare a final report that will include the matrix of action items and their completion status. The final list of action items will be prioritized in three levels according to risk. Deadlines for completion of remedial actions vary

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from thirty days to six months according to risk category. The MRMD team will monitor progress towards resolution of these items during the ensuing clearance phase. Adequate completion of each action item is subject to on-site verification by MRMD staff before shifting an action to cleared status.

Total cost of the Environmental Protection and Facility Safety Audit is estimated to be 1.250 \$M. This includes 7.5 person-years over 15 months (\$1 million) from MRMD for on-site inspection and engineering, \$50 thousand for the SAMS audit and report, and \$200 thousand for the electrical contractor. The City of Long Beach and OLBI will provide documentation and support, but will not otherwise contribute to the performance of the audit. The costs identified do not include expenditures to correct audit findings.

<b>Element</b>	<b>Staff</b>	<b>Cost</b>	<b>Full/Part Time</b>	<b>Duration</b>	<b>Pers. Yrs.</b>
MRMD	6	\$1 million	FT	15 mos.	7.5 PY
Elect Contractor	2	\$200K	PT	15 mos.	0.67 PY
MRMD SAMS	6	\$50K	PT	1 mos.	0.3 PY
		(\$1.25 mil)			

MRMD staff and the cost of the electrical audit will be funded by the Oil Spill Prevention Administration Fund (OSPAF) which currently funds the Safety Audit Program. This charge is estimated at 1.250 \$M, and has no impact on the State General Fund. There are currently no anticipated costs to be deducted from Unit net profits that would reduce General Fund revenue. Expenditures that may occur to correct audit findings will be charged to the Unit as ordinary expense.

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The Environmental Protection and Facility Safety Audit process is an activity performed on all offshore oil production facilities on State leases, including onshore processing equipment that support these facilities, every five (5) years. The level of detail and overall structure of these audits is identical to that which will be conducted at the Long Beach Unit. Because of the large size and extent of facilities that make up the Long Beach Unit, approximately 15 months will be required to complete the audit.

The consequences of a pollution incident from an offshore platform, because of their physical exposure to open water, are potentially greater than those of the Long Beach Unit because of the Unit's great area of containment and similarity to a land based oil production operations. For this reason, offshore platform audits are given higher priority, and every attempt is made to conduct repeat audits on a five (5) year period.

In addition to daily monitoring presence by State Lands' inspectors and City of Long Beach inspectors, LBU activities are overseen by and require permits from a number of agencies, including the DOGGR, OSPR, AQMD, SWQCB, USCG, and the local fire department. Inspection of safety and spill response devices and equipment are conducted monthly by State Lands inspectors, who are joined on a quarterly basis by DOGGR inspectors. Flaring of natural gas and natural gas emissions control data are reported to the AQMD, and must comply with permitted volumes. OSPR requires the maintenance of specified spill response equipment and company and contracted response resources, which are tested with annual spill response drills. The Long Beach Fire Department conducts periodic inspections of fire control equipment. Although none of these activities approaches the scope of the Commission's MRMD safety audit, they do serve to ensure the reliability and effectiveness of the procedures and equipment that are currently required to be in place.

The Long Beach Unit audit will cause a delay in the audit return period for offshore platforms, most notably, Platform Holly in the Santa Barbara Channel, which has been scheduled for audit this summer. That audit, as well as all others on the current schedule, will be delayed approximately 15 months, as seen on the following audit schedule list.

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**Effect of Long Beach Unit Audit on Current Schedule**

<b>Facility</b>	<b>Company</b>	<b>Scheduled Start</b>	<b>Delayed State Due to LBU Audit</b>
Platform Holly	Venoco	08/01/2011	11/01/2012
Rincon Island	Greka	04/01/2012	07/01/2013
Rincon Onshore Facility	Greka	04/01/2012	07/01/2013
Platform Emmy	Aera	04/01/2013	09/01/2014
Huntington Beach Strip	Aera	04/01/2013	09/01/2014
Huntington Beach Onshore Facility	Aera	04/01/2013	09/01/2014
Platform Eva	DCOR	02/01/2014	05/01/2015
Platform Esther	DCOR	02/01/2014	05/01/2015
Fort Apache Onshore Facility	DCOR	02/01/2014	05/01/2015
McGrath/Montalvo	Venoco	02/01/2016	05/01/2017
Ellwood Onshore Facility	Venoco	02/01/2016	05/01/2017

MRMD staff believes that delaying the start of the Long Beach Unit safety audit for approximately five (5) months until after platform Holly is audited would be a prudent scheduling option. OLBI is scheduled to conduct a safety review of the Long Beach Unit operations in October 2011. The information obtained from their efforts would be made available for MRMD staff and could assist in expediting the safety and environmental review audit. With current ongoing

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safety audits at Venoco's Montalvo field facility and Venoco's Ellwood onshore processing facility nearing completion, the project start date for the Holly safety audit could begin in mid-July, 2011. The field audit activities on the platform would take place during mild summer weather, which should decrease the number of days lost to inclement weather. The Long Beach Unit safety audit would then begin by December 2011. Since the Long Beach Unit islands are located behind the Long Beach Harbor Breakwater, it is expected that less days would be lost to inclement weather. Because of the extensive oversight of the Long Beach Unit by numerous governmental entities, Staff does not believe that such a delay will cause undue safety risks at the Long Beach Unit operation. However, such a delay will mean that the audit of the Long Beach Unit would be delayed by several months.

**Table of Acronyms**

ADM	Administrative Team
AQMD	Air Quality Management District
CSLC	California State Lands Commission
DOGGR	Department of Oil, Gas & Geothermal Resources
EFI	Equipment Functionality and Integrity Team
ELC	Electrical Team
ESD	Emergency Shut Down
HF	Human Factors Team
LBU	Long Beach Unit
MRMD	Mineral Resources Management Division
OLBI	Occidental Long Beach, Inc
OSPR	Office of Spill Prevention and Response
OWPA	Optimized Waterflood Program Agreement
P&ID	Piping and Instrumentation Diagram
PY	Person Years
RWQCB	Regional Water Quality Control Board
SAMS	Safety Assessment of Management Systems
TEC	Technical Team
USCG	United States Coast Guard



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**OTHER PERTINENT INFORMATION:**

1. Pursuant to the Commission's delegation of authority and the State CEQA Guidelines [Title 14, California Code of Regulations, section 15060(c)(3)], the staff has determined that this activity is not subject to the provisions of CEQA because it is not a "project" as defined by CEQA and the State CEQA Guidelines.

Authority: Public Resources Code section 21065 and Title 14, California Code of Regulations, sections 15060(c)(3) and 15378.

**EXHIBITS:**

- A. Letter dated April 28, 2011 to City of Long Beach
- B. LBU Safety and Pollution Prevention Audit Scope
- C. LBU Safety and Pollution Prevention Audit Best Achievable Protection Criteria

**PERMIT STREAMLING ACT:**

N/A

**RECOMMENDED ACTION:**

It is recommended that the Commission:

**CEQA Findings:**

1. Find that this activity is not subject to the requirements of CEQA pursuant to Title 14, California Code of Regulations, section 15060(c)(3) because the activity is not a project as defined by Public Resources Code section 21065 and Title 14, California Code of Regulations, section 15378.

**AUTHORIZATION:**

1. Authorize and direct the staff of the California State Lands Commission to implement the Long Beach Unit Safety and Pollution Prevention Audit as proposed herein to begin as soon as possible after the conclusion of the Platform Holly Safety and Pollution Prevention Audit.

## EXHIBIT A

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STATE OF CALIFORNIA

EDMUND G. BROWN JR., Governor

### CALIFORNIA STATE LANDS COMMISSION

GAVIN NEWSOM, *Lieutenant Governor*  
JOHN CHIANG, *Controller*  
ANA J. MATOSANTOS, *Director of Finance*



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April 28, 2011

Mr. Christopher J. Garner  
Director, Long Beach Gas and Oil Department  
211 East Ocean Boulevard, Suite 500  
Long Beach, CA 90802

Dear Mr. Garner,

At its April 28, 2011 public meeting, pursuant to Chapter 941 of the Statutes of 1991 (Chapter 941) and the Agreement for Implementation of an Optimized Waterflood Program (OWPA), the State Lands Commission (Commission) reviewed the Long Beach Unit Program Plan (July 1, 2011 through June 30, 2016) and determined that the Program Plan as a stand-alone document did not include sufficient detailed information on the safety and environmental programs for the Long Beach Unit to find that it does not involve any significant environmental or safety risk. Based upon this determination, the Commission ordered the Long Beach Unit Program Plan to be revised to include an environmental and safety review and assessment of the Long Beach Unit operations to be completed within 15 months.

Further, the Commission directed staff to return to the Commission within 60 days with a detailed scope of the environmental and safety review and assessment. Specifically, the Commission directed staff to consult with the City of Long Beach and Occidental Long Beach, Inc. on the scope of the review and assessment, which at a minimum, will include an identification and analysis of environmental and safety risks that could lead to potential human injury, an adverse environmental impact, or significant property damage and recommendations to improve the operations and Program Plan to address any identified risks. The Commission's action included an amendment to the recommended findings in the calendar item to reflect that the scope of the review and assessment shall include that the review be funded in a manner so as not to impact net revenues to the General Fund. The Commission did not order any changes to the Long Beach Unit Annual Plan (July 1, 2011 – June 30, 2012).

Commission staff looks forward to working with you and your staff, as well as representatives of Occidental Long Beach, Inc. in developing the scope and in conducting the environmental and safety review and assessment of the Long Beach Unit operations.

Sincerely,

  
CURTIS L. FOSSUM  
Executive Officer

Mr. Christopher J. Garner  
April 28, 2011  
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cc: Frank Komin, Occidental Long Beach, Inc.  
Charles Parkin, Deputy City Attorney

## **EXHIBIT B**

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### **LONG BEACH UNIT SAFETY AND POLLUTION PREVENTION AUDIT SCOPE**

#### **Purpose of Audit**

This audit is being conducted pursuant to the direction of the State Lands Commission in conjunction with the approval of the LBU Program Plan (July 1, 2011 through June 30, 2016). The SLC, as a stakeholder in the LBU, is conducting this audit. The LBU is regulated and audited by other governmental agencies, such as the Department of Transportation, the California Department of Oil and Gas and Geothermal Resources, etc., and does not fall under the regulatory purview of the SLC. Additionally, the LBU participants regularly perform audits of their facilities to ensure that all operations are conducted in accordance with all applicable regulations, industry standards, and good oil field practices.

#### **LBU Facilities to be Audited**

The Safety and Spill Prevention Audit will include all areas of the four oil and gas production islands, the Pier J oil and gas processing facility, all onshore well areas that are part of the LBU, the Pier J oil storage tank farm, and the Broadway Mitchell gas processing and oil shipping plant. The facilities will be audited using the standards outlined in Exhibit C as a guideline with consideration provided for the original design, construction, operational history and performance of the facility. In cases where there is no applicable standard, the audit will ensure that the operation is in compliance with good oil field practice, as set forth in the LBU unit agreements.

#### **Audit Activities**

The audit work will be organized within these five categories: equipment functionality and integrity, technical, electrical, administrative, and human factors. Each of these five categories is described in more detail below.

##### *Equipment Functionality & Integrity*

The equipment functionality and integrity team will evaluate the physical condition of the facility, its equipment, operation, state of maintenance, and fitness for service. This team will conduct the field portion of the audit and the facility and process design information documents will be physically verified as to existing arrangement and operation. Design information including piping and instrumentation diagrams (P&IDs) and process flow diagrams (PFD) will be comprehensively checked for accuracy and to see if undocumented changes have been made. Checklists will be used to assess maintenance, condition, and

integrity or fitness for service of the piping, tanks, pressure vessels, and equipment from the wellhead to the sales and custody transfer point at the end of processing where the oil or gas leaves the facility. The long term monitoring and maintenance of other major equipment such as compressors, pumps, other process components and emergency generators will be verified. All safety systems and equipment such as the firefighting system, gas detection, and other systems will be thoroughly inspected in the field using checklists for maintenance, fitness, and compliance with appropriate standards. During field assessment work, general conditions at the facility, housekeeping, and obvious safety hazards will be noted and action items will be identified. This field work verifies existing conditions, operation, equipment arrangement and specifications so that the design standards may be checked as part of the technical team's work.

### *Technical*

The technical team will use the information previously verified in the field by the equipment functionality and integrity team. The technical team reviews the design of the facility, and verifies compliance with appropriate design codes and standards. The field verified facility P&ID's, PFD's, and other design documentation will be evaluated for compliance with industry standards. The facility hazards analyses, (Process hazard Analysis (PHA), or Hazards Analysis and Operability Study (HAZOP)) will be reviewed to ensure the facility has the necessary safety devices and safeguards, that changes or modifications have been included, and that the required periodic re-validation has been performed to include risks from incidents or accidents that have been experienced or to address any changing conditions or operations. Safety devices, controls, and detection sensors will be reviewed along with the logic, failsafe features, system installation, and design standard adherence. Issues identified by the equipment functionality and integrity team will be researched and evaluated including the design standards applied and material and equipment specifications. Any problems with conformance of operations with the various operations manuals, emergency response plans, operating procedures, and other required regulatory plans will be addressed and may be referred to the administrative team for further review.

### *Electrical*

An outside electrical contractor will be employed for this phase of the audit. The electrical team will evaluate the physical condition of the facility's electrical system, electrical equipment, electric or electronic controls, and the operation, state of maintenance, and fitness for service of these systems. These systems will be handled separately because of their critical risk and because they require specialized electrical engineering expertise with oil and gas production facilities and offshore platforms or facilities. The electrical team will review all the electrical drawings, such as the one-line diagram of the electrical distribution system and the hazardous area classification diagrams for compliance with the National Electrical Code (NFPA 70) and other applicable electrical codes.

### *Administrative*

The administrative team will review the facility's operations manual, operating procedures, the oil spill contingency plan, business emergency plan, spill prevention control and countermeasures plan, and other regulatory required plans and documents to verify they are

up to date and being followed based on observations during the equipment functionality and integrity field work. Safety management programs that have been implemented will be also reviewed. This review includes training, safe work practices, management of change, investigation of incidents, internal auditing, and the use and updating of operating procedures.

#### *Human Factors*

The human factors team will evaluate safety culture and safety management systems to help minimize accidents and pollution incidents. Much of the program information already reviewed by the administrative team can be compared with results of interviews and field observations of operations. The CSLC safety assessment of management systems (SAMS) interview process is used to complete this human factors assessment.

## Exhibit C

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### LBU SAFETY AND OIL SPILL PREVENTION AUDIT BEST ACHIEVABLE PROTECTION CRITERIA

#### 1.0 CODE AND REGULATIONS

- |     |  |                    |
|-----|--|--------------------|
| 1.1 | Best Achievable Protection/ Best Achievable Technology | PRC 8750           |
|     | Inspection of Marine Facilities                        | PRC 8757           |
|     | DOG Oil & Gas Regulations                              | DOG 14 CCR 1743(b) |

#### 2.0 EQUIPMENT FUNCTIONALITY & INTEGRITY

- |        |   |                                  |
|--------|---|----------------------------------|
| 2.1    | General Facility Conditions                                 |                                  |
|        | 2.1.1 <i>Housekeeping</i>                                   |                                  |
|        | 2.1.2 <i>Stairs, Walkways, Gratings, &amp; Ladders</i>      | CAL OSHA Title 8 CCR             |
|        | 2.1.3 <i>Escape/ Emergency Egress/ Exits</i>                | CAL OSHA 3215, 22, 25, 6577      |
|        | 2.1.4 <i>Labels, Placards, &amp; Signs</i>                  | CAL OSHA & API RP 14J            |
|        | 2.1.5 <i>Security</i>                                       |                                  |
|        | 2.1.6 <i>HAZMAT Storage</i>                                 |                                  |
| 2.2    | Field Verification of Plans                                 |                                  |
|        | 2.2.1 P&ID  | API RP 14J                       |
|        | 2.2.2 Fire Protection                                       | API RP 14J (6.4.3)               |
| 2.3    | Condition and Integrity of Major Systems                    |                                  |
|        | 2.3.1 <i>Piping</i>   | ANSI 31.3                        |
|        | 2.3.2 <i>Tanks</i>  | API Spec 12 R1                   |
|        |   | API RP 653                       |
|        | 2.3.3 <i>Pressure Vessels</i>                               | ASME Boiler & PV Code Sect. VIII |
|        |   | API RP 510 PV Insp Code          |
|        | 2.3.4 <i>Pressure Relief, PSVs and Flare Sys</i>            | API RP 14J                       |
|        |   | API RP 520                       |
|        |   | API RP 521                       |
|        |   | API RP 576                       |
|        | 2.3.5 <i>Fire Detection</i>                                 | NFPA                             |
|        | 2.3.6 <i>Fire Suppression</i>                               | NFPA                             |
|        | 2.3.7 <i>Combustible Gas &amp; H<sub>2</sub>S Detection</i> |                                  |
|        | 2.3.8 <i>Emergency Shutdown Device</i>                      | API RP14J                        |
|        | 2.3.9 <i>Safety &amp; Personnel Protective Equip</i>        | CAL OSHA                         |
|        | 2.3.10 <i>Lighting</i>                                      | CAL OSHA                         |
| 2.3.11 | <i>Instrumentation, Alarm, &amp; Paging</i>                 | API RP 14J, & ISA                |
|        | 2.3.12 <i>Blow Out Prevention</i>                           |                                  |
|        | 2.3.13 <i>Emergency Generator</i>                           | NFPA 110                         |
|        | 2.3.14 <i>Compressors</i>                                   | CAL OSHA 8 CCR 461-465           |

	2.3.15 <i>Spill Containment</i>	40 CFR 112.7 (c), GOV CODE 8670
	2.3.16 <i>Spill Response</i>	GOV CODE 8670
2.4	Mechanical Integrity	CAL OSHA, 8 CCR 5189 (j),
	2.4.1 <i>ESP, Pump Units &amp; Wellhead Equip</i>	API SPEC 6A

### 3.0 ELECTRICAL AUDIT

3.1	Electrical Area Classification <ul style="list-style-type: none"> <li>• <i>Level of classification</i></li> <li>• <i>Extent of classification</i></li> </ul>	API RP 500, NFPA 70
3.2	Electrical Power Dist. System, Normal Power <ul style="list-style-type: none"> <li>3.2.1 <i>System Configuration</i></li> <li>3.2.2 <i>Equipment and Component Ratings</i></li> <li>3.2.3 <i>System Electrical Design Safety</i> <ul style="list-style-type: none"> <li>• <i>System protection</i></li> <li>• <i>Operational safety</i></li> <li>• <i>Reliability</i></li> </ul> </li> <li>3.2.4 <i>Grounding (system and equipment)</i></li> </ul>	API RP 540, NFPA 70
3.3	Elec. Power Equip Condition and Functionality <ul style="list-style-type: none"> <li>3.3.1 <i>Wiring Methods and Enclosures materials and installation</i> <ul style="list-style-type: none"> <li>• <i>Classified locations</i></li> <li>• <i>Unclassified locations</i></li> </ul> </li> <li>3.3.2 <i>Safety Procedures</i> <ul style="list-style-type: none"> <li>• <i>Lockout tagout procedures</i></li> <li>• <i>Electrical safety training</i></li> <li>• <i>Extension cord and portable equipment testing</i></li> </ul> </li> </ul>	API RP 540, NFPA 70
3.4	Emergency and Standby Power (including batteries, chargers and uninterruptible power supplies) <ul style="list-style-type: none"> <li>3.4.1 <i>System Configuration</i></li> <li>3.4.2 <i>Equipment and Component Ratings</i></li> <li>3.4.3 <i>Electrical System Design Safety</i> <ul style="list-style-type: none"> <li>• <i>System protection</i></li> <li>• <i>Operational safety</i></li> </ul> </li> </ul>	NFPA 70, NFPA 110
3.5	Electric Fire Pump System <ul style="list-style-type: none"> <li>• <i>Starter equipment and controls</i></li> <li>• <i>30 minute fire rated wiring</i></li> </ul>	NFPA 20, NEC 696
3.6	Process Instrumentation Wiring Methods, Materials and Installation <ul style="list-style-type: none"> <li>• <i>Classified locations</i></li> <li>• <i>Unclassified locations</i></li> </ul>	API RP 540, NFPA 70



3.7	Standby Lighting	IES RP 7
	<ul style="list-style-type: none"> <li>• <i>Fixture locations, type</i></li> <li>• <i>Operation</i></li> <li>• <i>Lighting levels</i></li> </ul>	
3.8	Special Systems	
	3.8.1 <i>Safety Control Systems, Electrical Shutdowns</i>	API RP 14J API RP 75 ISA RP7.1, RP 12.1, 12.2 ISA S7.4, S12.4
	<ul style="list-style-type: none"> <li>• <i>System configuration</i></li> <li>• <i>System component types and locations</i></li> <li>• <i>System devices and wiring</i></li> <li>• <i>Review testing records</i></li> </ul>	
	3.8.2 <i>Gas Detection System</i>	API RP 14J
	<ul style="list-style-type: none"> <li>• <i>System configuration (SD devices normally energized, fail safe)</i></li> <li>• <i>System component types and locations</i></li> <li>• <i>System devices and wiring</i></li> <li>• <i>Review testing records</i></li> </ul>	
	3.8.3 <i>Fire Detection System</i>	API RP 14J, API RP 75
	<ul style="list-style-type: none"> <li>• <i>System configuration (8 hour backup power)</i></li> <li>• <i>System component types and locations</i></li> <li>• <i>System devices and wiring</i></li> <li>• <i>Review testing records</i></li> </ul>	
	3.8.4 <i>Aids to Navigation</i>	USCG 33 CFR Subcp. C, Part 67
	<ul style="list-style-type: none"> <li>• <i>System component types and locations</i></li> <li>• <i>Suitable enclosures</i></li> <li>• <i>Circuit voltage drop less than 2.5%</i></li> <li>• <i>Coast Guard records</i></li> </ul>	
	3.8.5 <i>Communication Equipment</i>	
	<ul style="list-style-type: none"> <li>• <i>4 hour battery operation</i></li> </ul>	
	3.8.6 <i>General Alarm System</i>	
	<ul style="list-style-type: none"> <li>• <i>System configuration</i></li> <li>• <i>System component types and locations</i></li> <li>• <i>System devices and wiring</i></li> <li>• <i>Review testing records</i></li> </ul>	
	3.8.7 <i>Cathodic Protection</i>	API RP 651, NACE RP 01-76, NACE RP 0675
	<ul style="list-style-type: none"> <li>• <i>System components</i></li> <li>• <i>Equipment and wiring complete / operational</i></li> </ul>	

## 4.0 TECHNICAL AUDIT

4.1	Offshore Production Safety Systems	API RP 14C* <i>*as applicable to Island Facilities</i> API RP 14J 29 CFR 1910 API RP 75
4.2	Onshore Production Safety System	CAL OSHA 8 CCR 5189 29 CFR 1910 API RP 51
	4.2.1 Process Hazards Analysis	CAL OSHA 8CCR 5189 (e) API RP 75 API RP 14J Gov Code 8670.28 (a)(7)
4.3	Wellheads, Surface Subsurface Safety Valves	
4.4	Safety Devices on Vessels and Tanks	API RP 520, API RP 14J
4.5	Pressure Relief Valves	API RP 520
4.6	Relief and Flare System	API RP 520 & 521
4.7	Fire Detection System	NFPA API RP 14J
4.8	Fire Protection System	NFPA UFC
4.9	Combustible Gas Detection & Alarm System	
4.10	H <sub>2</sub> S Detection & Alarm System	API RP 55
4.11	Auxiliary Electrical Power Supply	
4.12	Compressors, Shipping Pumps, & Pipelines	
4.13	Spill Containment	40 CFR 112.7 (c)(1)
<b>5.0</b>	<b>ADMINISTRATIVE AUDIT</b>	
5.1	Operations Manual	OSPR PRC 8758
5.2	Spill Response Plan	OSPR PRC 8758 OSPR 14 CCR 816.01
5.3	Required Documents & Records	OSPR PRC 8758 OSPR 14 CCR 820.01
5.4	Training, Drills, & Applications	OSPR PRC 8758 OSPR 14 CCR 820.01
<b>6.0</b>	<b>HUMAN FACTORS AUDIT</b>	
6.1	Process Safety Management	CAL OSHA 8 CCR 5189 API RP 75 CSLC Safety Audit of Mgmt Systems (SAMS)