California State Lands Commission

Safety and Oil Spill Prevention Audit

VENOCO

McGrath PRC 735 & 3314 Leases

November, 2011

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The objective of the Safety Audit Program is to ensure that all oil and gas production facilities on State leases or granted lands as well as upland locations supporting these facilities are operated in a safe and environmentally sound manner complying with Federal, State, and Local codes/permits, as well as industry standards and practices. The Safety Audit of Venoco Inc. leases (PRC 735 and PRC 3314) were conducted from May 2011 through September 2011 with the final report being issued in November 2011.

Background

Venoco Inc. (Venoco), with corporate headquarters in Denver, CO and regional offices in Carpentaria, CA and Houston, TX is an independent oil and gas company engaged in developing and producing domestic oil and gas properties primarily in California and Texas. Venoco's California core operations are located in and around the Santa Barbara Channel and in the Sacramento Basin.

Venoco was assigned two leases (PRC 735 and PRC 3314) located in Ventura County from Berry Petroleum in October 2007. State Lease PRC 735 consist of approximately eight wells and a small processing facility, that is located just south of the Ventura River and is bordered by the Pacific Ocean and Harbor Boulevard on the west and east respectively. State Lease PRC 3314 consists of two wells and a small processing facility that is located southeast of PRC 735 and is bordered by Harbor Boulevard to the west and Gonzales Road to the north. The 3314 lease tank farm with the exception of the wells was undergoing major demolition at the time of the audit.

Production figures for August 2011 for PRC 735 averaged 150 barrels of oil per day and 85 MCF gas per day and PRC 3314 averaged 175 barrels of oil per day and 93 MCF of gas per day. These leases are in the declining stages of production, although a recent re-drill of one of PRC 735 idle wells into the PRC 3314 lease in late 2007 had good initial production and further re-drills are planned. Venoco has plans to redrill seven PRC 735 wells into the 3314 lease in hopes of increasing production.

Safety Audit Procedures

The Safety Audit followed established procedures to address four functional areas: Equipment Functionality and Integrity, Technical, Administrative, and Human Factors. Venoco personnel assisted CSLC staff during field activities and through direct consultation during the audit.

Safety Audit Results

The safety audit identified a total of 43 action items. All the action items found were ranked Priority Three. The Priority Three action items that were identified have a low risk potential for injury, oil spill, adverse environmental impacts, or property damage. These items normally include outdated drawings, manuals, and procedures

and require correction within 180 days. The following table shows the Priority level and the nature of the Action Item as indicated by team:

Action Items
Priority

Team	1	2	3	Total
ADMIN	0	0	0	0
EFI	0	0	42	42
TECH	0	0	1	1
Total	**0**	**0**	**43**	**43**

The Equipment Functionality & Integrity Team accounted for 42 of the 43 Action Items or 98%. There was one Priority Three Action Item, or 2% of the 43 Action Items that came under the Technical review section that dealt with some minor additions to the Cause and Effect Chart. By far, the majority of these items are Priority Three Action Items addressing changes not shown on mechanical drawings, physical condition or maintenance issues, or labeling of tanks, piping, and equipment. The facility and equipment were found to be in normal to better than expected operating condition for a 40 year old facility. A number of the EFI action items concerned information that needed to be updated on Process and Instrumentation Drawings (P&IDs) and were assigned the lowest priority.

The external condition of tanks, pressure vessels, and piping and their paint coatings was observed to be in fair condition. Venoco has hired a certified third party contractor to clean and inspect pressure vessels and provide reports on conditions. All firefighting and other emergency and spill response equipment were also observed to be in good order and adequately maintained except as noted by one action item. Personal protective equipment was observed to be readily available and fully utilized, and Safety Programs appeared to be in place and effective.

The facility control systems met the Mineral Resources Management Division (MRMD) requirements.

Conclusion

PRC 735 and PRC 3314 were found to have a high level of compliance with the MRMD regulations and other applicable regulations, codes and standards. Considering the fact that there were only priority three action items is significant. All Venoco personnel were very cooperative in conducting this audit and demonstrated responsibility for safety and environmental protection. Venoco has also demonstrated a commitment to Safety and Pollution Prevention. Venoco L.L.C. should be commended on their continued commitment to safety and protection of the environment.

Introduction

1.0 INTRODUCTION:

1.1 Background:

The California State Lands Commission (CSLC) Mineral Resources Management Division (MRMD) staff is conducting detailed safety audits of operators and/or contractors for lands in which the State has an interest. The objective of these safety audits is to ensure that all oil and gas production facilities on State leases or granted lands are operated in a safe and environmentally sound manner and comply with Federal, State, and local codes/permits, as well as industry standards and practices. The MRMD staff is tasked with providing for the prevention and elimination of any contamination or pollution of the ocean and tidelands, for the prevention of waste, for the conservation of natural resources, and for the protection of human health, safety and property by sections 6103, 6108, 6216, 6301, and 6873(d) of the Public Resources Code (PRC). These PRC sections provide authority for MRMD regulations as well as the existing inspection program and the safety audit program that augments it.

The Safety Audit Program was developed in response to PRC 8757 (a), which originated from the Lempert, Keene, Seastrand Oil Spill Prevention Act. In this Act, existing oil spill prevention programs were considered insufficient to reduce the risk of significant discharges of petroleum into marine waters. Marine facilities were specifically required to employ best achievable technology or protection and the CSLC was required to regularly inspect all marine facilities and monitor their operations and their effects on public health and safety, and the environment and regulations. The Safety Audit Program was established, as a result, to augment the existing inspection program, further preventing oil spills and other accidents. The Safety Audit Program augments prevention efforts by way of a thorough review of design, maintenance, human factors, and other evolving areas.

The MRMD used four teams, each with specific focus, to conduct this safety audit. The four teams systematically evaluate the facilities, operations, personnel, and management from many different perspectives. The four teams and their areas of emphasis include:

1) Equipment Functionality and Integrity (EFI)
2) Technical (TEC)
3) Administrative (ADM)
4) Human Factors (HF)

Each team reports progress and findings periodically throughout their audit evaluations. For each of the teams appropriate company contacts and resources are identified. Each team records findings on an action item matrix for its area with recommended corrective actions and a priority ranking for the specified corrective action. Because of the overlap of functions, more than one team may identify some items, but the duplication of findings across multiple teams has been reduced as much as possible.

The audit report highlights the findings of each team and the most significant action items. It also includes the complete matrix of action items. Draft copies of the audit report and the matrix of action items are provided to the company periodically throughout the audit. The final audit report is provided to company management during a formal presentation of the results. The presentation affords the opportunity to discuss the findings and the corrective

actions proposed in the final report. The MRMD continues to assist the operator in resolving the action items and tracks progress of the proposed corrective actions. Adjustments to the inspection program are then made based on the Safety Audit.

This program could not be successfully undertaken without the cooperation and support of the operating company. It is designed to benefit both the company and the State by reducing the risk of personnel or environmental accidents, damage, and in particular, oil spills. Previous experience shows that the safety assessments help increase operating effectiveness and efficiency and lower cost. History has shown that improving safety and reducing accidents makes good business sense.

1.2 Operating Company History:

Venoco, Inc. (Venoco) is an independent energy company primarily engaged in the acquisition, exploration and development of oil and natural gas properties in California and Texas. It has regional headquarters in Carpinteria, California and Houston, Texas and the corporate headquarters are in Denver, Colorado. Venoco operates three offshore platforms in the Santa Barbara Channel, has non-operating interests in three other platforms, and also operates two onshore properties in Southern California, approximately 250 natural gas wells in Northern California and more than 100 wells in Texas.

Venoco purchased onshore properties in early 2007, when Berry Petroleum (Berry) decided to sell its lease holdings in Ventura, California, including State owned properties in the West Montalvo Field. These properties include the State PRC 735 and PRC 3314 offshore oil and gas leases. The reassignment of interest (100%) in both PRC 3314.1 and PRC 735.1 leases was approved by the Commission in October of 2007.

Oil and Gas Lease PRC 3314.1 was originally issued to Shell Oil Company in 1965. Through a series of assignments, the present lessee and operator is Venoco. PRC 3314.1 had two wells drilled into it since resumption of drilling was authorized for that lease in 1981. The wells, drilled from onshore drillsites, produce oil and gas today, averaging about 175 barrels of oil per day, and 93 MCF gas per day. Venoco completed the first of two redrill wells for PRC 3314. These two redrills were authorized by the California State Lands Commission (Commission) in 2006 and were drilled from idle onshore wells located at the PRC 735 well area.

Oil and Gas Lease PRC 735 was issued to Standard Oil Company of California in 1952. Through a series of assignments, the present lessee and operator is Venoco. PRC 735 was first assigned to Berry in 1992. Berry undertook an aggressive program of well work and redrills that increased the production in the field significantly, but production has been declining since that time and currently averages 150 barrels of oil per day, and 85 MCF gas per day. Venoco has plans for redrilling seven wells into the 3314 Lease from the 735 Lease well production area, which the California State Lands Commission has authorized.

1.3 PRC 735 and PRC 3314 Lease Facilities:

Produced fluids from each lease are processed at dedicated or nearby tank farms where the gas, water and oil are separated. Oil is dehydrated and sent to the stock tanks, the produced water goes to a waste water tank, and gas is used for fuel, process function or it is flared prior to shipping for sale. Both leases have their own air compressors, gas scrubbers, shipping pumps, LACT units and covered sumps.

PRC 735 Lease

The PRC 735 Lease has a strip of eight oil wells, six of which were online at the start of the audit. One well on the 735 Lease surface is drilled into the 3314 Lease. The wells are located parallel to the beach and produce their fluid to the tank farm via a pipe chase. There are a total of four pipelines. There are two main oil gathering lines, one for the 735 Lease production and one for the 3314 lease production. The produced fluid of oil, water and gas, pumped from the wells then goes through their respective lease line heaters that aid in separation and flow. The production proceeds through wet oil meters. The wet oil meters are used for initial measurement of oil, gas, and water. The oil from the 735 Lease and 3314 Lease is metered separately for royalty allocation before it is co-mingled again with the fluid from other wells. The oil then goes on to a heater treater for further dehydration and then to a stock tank. From there the oil is pumped through a Lease Allocation Customer Transfer unit (LACT) to the 8" Crimson Oil pipe line outside the 735 Lease, east of Harbor Blvd. Gas production comes from one casing gas line that both leases flow into. The gas is put through a gas scrubber to remove any water and is then used for process function, for fuel, it is sold or flared. There is also a test line for the 735 Lease for testing the production of a selected well. The produced water is disposed of by the water injection wells.

PRC 3314 Lease

The PRC 3314 Lease has two wells that are drilled from the 3314 Lease production area. The fluid is sent directly to the Colonia Lease through three pipelines. There is the main production line, a casing gas line and a test line. The oil is sent through a wet oil meter and then proceeds to a LACT unit. CSLC has limited jurisdiction over the Colonia Lease.

Equipment Functionality & Integrity Audit

2.0 EQUIPMENT FUNCTIONALITY & INTEGRITY AUDIT:

2.1 Goals and Methodology:

The primary goal of the EF&I Team was to evaluate the physical condition and maintenance of the facilities and equipment. This was accomplished through a series of inspections of systems and equipment, as well as through the verification of key diagrams and plans. The layout of this section of the report reflects this system based methodology.

2.2 General Facility Conditions:

2.2.1 Housekeeping: The PRC 735 and PRC 3314 Leases were inspected concurrently and were found to be in good order and predominantly clean. The 3314 Lease is currently undergoing demolition to the majority of its equipment as the oil from this lease is now being processed at the nearby Colonia facility. Although the 3314 production area appears disorderly as it is being disassembled. What remains is expected to appear clean and orderly. The 735 Lease is undergoing an upgrade to its tanks and equipment to handle more production from seven wells that will be redrilled in the near future. The Venoco production operations appear to follow good oilfield practices with few minor exceptions. There were a few concerns noted during the audit process regarding housekeeping procedures. Handling and clean up of minor oily waste and residue inherent to normal daily operations were identified in Priority 3 action items. (EFI – 2.2.1.01 thru .04) These action items concerned areas around the Vapor Recovery compressors, H-702 and V-705 at the PRC 735 Lease. Some soil contamination had been caused by minor equipment oil leaks that had run off the concrete pad onto the adjacent soil.

2.2.2 Stairs, Walkways, Gratings, and Ladders: All gratings on the elevated work platforms at all pumping unit wells were in good shape. At the 735 Lease, there is only one bridge that goes over the piping along the ground. An additional bridge should be considered for installation by tank T-5. A recent new line installation is making for a wider stride required to clear the piping. This could result in an injury from tripping and falling. (EFI – 2.2.2.01) The slope going up to the eyewash station at the 735 lease appears hazardous to walk up due to large clumps of earth. In an emergency situation, such as a person with chemical in their eyes, the afflicted person would find it difficult to reach the eyewash station in a hurry. (EFI 2.2.2.02)

2.2.3 Escape / Emergency Egress / Exits: Due to the design, size, and open arrangement of the two leases, there were no areas of concern regarding access and egress.

2.2.4 Labeling, Color coding, and Signs: Labels and signs throughout both leases are present and adequately legible. Piping identification will be addressed later in section 2.4.1, as well as tank identification in sections 2.4.2. Signs indicating the well and PRC numbers were prominently displayed on the pumping units. Throughout the lease, exposure to the elements has caused some of the labeling to fade and peel. While not critical at this time, this condition should be corrected. (EFI – 2.2.4.01) Lease signs with emergency contact information are missing at the front gate to the PRC 735 Lease and 3314 lease. This information needs to be posted on both lease gates. (2.2.4.02 & 03) There are no signs to warn the public against trespass posted at each production facility. (2.2.4.04 & 05).

There were concerns about the labeling of some of the tanks at the PRC 735 Lease. Tanks TK-6 and TK-7 (on the P&ID), were also relabeled # 40 and # 41. Tanks should be clearly identified for everyday operations and in the event of an emergency and tank markings should agree with the P&IDs. (EFI – 2.2.4.06) The NFPA diamond is a nationally recognized method of indicating the presence of a hazardous material and gives the general hazards and the degree of severity. NFPA identification diamonds were posted on all the tanks and were in good condition.

2.2.5 Security: Entry of authorized personnel to the PRC 735 Lease is controlled by a gate off Harbor Blvd. that can be unlocked by the operator. It is normally kept locked at night, yet seems to be open most of the day due to incoming and outgoing traffic. CSLC understands that access to this area must be left open due to land ownership needs and other government entities that require access. Security to the tank farm and the well strip can still be attained by fencing in those areas with regulatory required chain link fencing and barbed wire. Venoco is in the process of doing a comprehensive evaluation on the security of both leases. (2.2.5.01 & 02) No trespassing signs around each perimeter should also be posted. Vehicle guard posts are installed to protect some of the vessels at the 735 Lease from damage from vehicles, but there were no vehicle barrier posts present for V-705 and V-706. (EFI – 2.2.5.03 & .04) Two gates at the 735 Lease were noticed to be unlocked during the audit and should normally remain locked for safety and security. One gate was to the 480 volt enclosure located at the well strip. (EFI – 2.2.5.05) The other was to the ground flare that was unlocked while the flare was in operation. (EFI – 2.2.5.06)

2.2.6 Hazardous Material Handling and Storage: The storage of flammable and combustible liquids conforms to Cal-OSHA and NFPA 30 standards. The MSDS are readily available for each hazardous substance and can be found inside the main office. Chemical storage appears to be properly protected against external damage and leaks. Bulk chemical totes were observed to have proper labeling and adequate containment in the event of a spill.

2.3 Field Verification of Plans:

2.3.1 Process Flow Diagrams (PFD): PFD drawings were undergoing a complete revision at the time of the audit. It is recommended that these drawings be developed showing all the major process streams. PFDs are an important supplement to P&IDs and operating information.

2.3.2 Piping and Instrumentation Diagrams (P&ID): The P&IDs for all oil and gas gathering systems on both leases were available from the start of the audit for review. The EF&I Team conducted field verifications of the P&IDs, Field checks started in March, 2011 and were completed by May, 2011. Drawings provided by Venoco's were last updated in 2010 and either showed equipment that was no longer there, or had equipment that was not on the P&IDs and so, need to be updated. (EFI – 2.3.2.01 through .09)

2.3.3 Fire Protection Drawings: There are no fire protection drawings available for either lease. A simple diagram needs to be created to help fulfill the MRMD requirements for an operations manual. (MRMD 2175 (b) (11) and (12) This drawing would be similar to Station

Bill Drawings that are located on all offshore platforms. The drawings denote where fire extinguishers and eye wash stations are located. CSLC recommends these to be posted and understands that fire protection drawings are currently being developed. (EFI – 2.3.3.01)

2.4 Condition and Integrity of Major Systems:

2.4.1 Piping: The condition and maintenance of piping throughout the PRC 735 and PRC 3314 Leases were found to be compatible with the fluids being handled. Some common problems that were identified included missing or damaged support brackets and clamps, inadequate labeling and some areas of corrosion and coating failure. (EFI – 2.4.1.01, .03 thru .09) These problems could lead to a future leak and a possible spill.

Labeling and identification of the major piping lines throughout both leases needs improvement. Major process lines and piping are missing identification and flow arrows to assist operating personnel in identifying lines. Operating personnel currently have to rely on their memory or must trace lines to accurately identify them. It is recommended that ANSI Standard A13.1 regarding this type of labeling for piping be considered for adoption throughout both leases. (2.4.1.02)

The primary method of external corrosion prevention for piping on both leases is use of primer coating and paint to seal out moisture. Piping had not been repainted for some time and was exhibiting some corrosion from mechanical wear, exposure to weather, and some loss of wall thickness has occurred. The salt air at onshore facilities close to the beach is known for accelerating the rate of external corrosion. A program of coating evaluation, maintenance, and repairing should be used to ensure external corrosion does not result in leaks and possible oil spills and gas releases.

2.4.2 Tanks: The tanks at the 735 Lease are up to date with their internal and external inspection programs. Venoco is using Diversified Technology Services (DTS) out of Santa Maria, Ca. to monitor the integrity of their tanks and vessels and to conduct these inspections at the proper intervals. A priority 3 action item was generated for not having any of the tanks grounded. (EFI – 2.4.2.01)

2.4.3 Pressure Vessels: Pressure vessels are compliant with their internal and external inspection schedules. Some of the vessels are in excess of 25 years of age and are seen to be suffering from some external coating failure, but the pressure vessels are sound and these conditions are being monitored by Venoco.

2.4.4 Relief System: The pressure safety valves on both leases are equipped with short tailpipes to relieve directly to the atmosphere. The maintenance and servicing intervals for all Pressure Safety Valves (PSVs) were examined for compliance with applicable regulations and recommended standards, as well as, record keeping within a preventive maintenance system. The PSVs have been serviced and tested for the last three years by Ventura Valve Service of Ventura, California, an outside contractor and all appeared properly installed and serviceable. The frequency of inspection of these relief valves is six months, one year, or five years depending on the service of the relief valve. Service records for relief valves indicated that all were being tested and serviced within the required intervals.

Both leases have their own ground flares. Gas is sent to the flare system when it exceeds the pressure on the Vapor Recovery System, but before the pressure is enough to relieve through the vessel's pressure safety valves. Normal venting and process upsets are directed to the ground flares at safe locations by means of the gas vent system and relief piping. The ground flare uses standing pilots and is of a "smokeless" design. Each flare is located a safe distance from related equipment and is of sufficient height to protect workers and the public during maximum flaring. Safeguards include perimeter fencing which is employed as a means to protect the public and wildlife.

2.4.5 Fire Detection Systems: Neither lease is equipped with a fire detection system of any type.

2.4.6 Fire Fighting Equipment: Both lease locations have portable fire extinguishers in quantities that seem appropriate for each location. Since Venoco's purchase, they have increased the number of extinguishers. Joy Equipment Protection, an outside contractor based in Carpinteria, California, is contracted to perform annual inspections and maintenance. These systems appear to be generally in good condition. Venoco personnel perform monthly visual inspections but not all monthly inspections are being documented. (EFI 2.4.9.01) It appears that Joy is properly maintaining the equipment and the proper maintenance records.

Venoco's personnel receive training in the use of the portable fire extinguishers. Although overall facility firefighting response is provided by the local Fire Department, a first response during incipient stages of a fire by company personnel may be appropriate with this equipment.

2.4.7 Combustible Gas (LEL) and Hydrogen Sulfide (H_2S) Detection: Neither lease is equipped with a combustible gas or hydrogen sulfide (H_2S) detection system. There is some H_2S present at the 735 Lease in low concentrations, typically in the 25 to 30 ppm range. Recent H2S readings at the 735 Lease Gas Scrubber V-705 were 38 ppm. There are scrubbers in place to sweeten the gas prior to sales. The operators carry portable H2S detectors. It is suggested that Venoco periodically reconsider the use of a fixed combustible gas or H2S detection system for the facility. Gas detection monitors strategically located throughout the production facilities could help provide early detection of a gas leak and enhance the safety of operating personnel, as well as the environment. Operators are properly equipped with portable gas monitors as required.

2.4.8 Emergency Shutdown Device (ESD): Neither lease has an Emergency Shut Down switch for the facility. The wells depend on a "Murphy Switch" pressure sensor to shut down the individual well on either a high or low pressure situation. The tank farm relies on a leak being detected by the operator visually. If a pipeline or a tank leak is found, it is necessary for an operator to take appropriate actions to shut down and contain the spill, and make notifications. Spotting such a condition may take some time, allowing more quantities to be spilled. The State recommends the consideration of an installed and easily accessible ESD for each Lease facility.

2.4.9 Safety and Personal Protective Equipment (PPE): Venoco employees and contractors demonstrated strict adherence to the PPE standards. They were observed to

comply with rules and standards on the use of steel-toed safety shoes, hardhats, safety glasses, and were observed to consistently follow other applicable rules and procedures. All of the operators have H2S monitors, and quad monitors to test for the presence of gas, as well as the level of oxygen. They also have first aid kits and fire extinguishers in their vehicles. The use of proper PPE is covered in depth during the orientation process.

2.4.10 lighting: Both leases appear to have sufficient fixed lighting to conduct operations at night. Pole mounted fixtures with high-pressure sodium vapor or similar type lighting is used. There is not any backup power in the event of a power failure, but a backup system is not required. Operators can augment lighting with vehicle headlights, personal flashlights, and portable lighting units like the one that was being used at the 735 tank farm as needed.

2.4.11 Instrumentation, Alarm, and Paging: Pressure and temperature gauges are located throughout all lease processing equipment. A few gauges appeared to be weathered, but they were typically readable and seemed to function properly. Both leases are equipped with a paging system that automatically calls the operator to inform them of a high level condition, allowing them time to respond from other production areas and remedy the condition. There is a computer based system in the field office that monitors and displays process parameters, including alarms. The operators also have the same program on a laptop computer in their trucks. They receive this information via a Wi-Fi signal from the tank farm.

There are air compressors located at each lease to provide air pressure for the instrument and control air systems. These appear to be adequately sized.

2.4.12 Auxiliary / Emergency Generator: An emergency or auxiliary generator is not available or required at either lease. The operation relies solely on local electrical utilities and goes to a safe condition when power is lost.

2.4.13 ESP, Pump Units, Wellhead Equip. & Well Safety Systems: There are eight wells at the PRC 735 Lease; they consist of one Lufkin walking beam type unit, six Roto-Flex, and one Dyna Pump rod well type units. Both wells at the PRC 3314 Lease are a Roto-Flex type of pumping unit. Considering the salt air environment that the pumping units are exposed to, the pumping units are in fair mechanical condition. Because of the pumping units design and construction using steel channels, I beams and other angular shapes, these units may be more susceptible to corrosion from the marine environment. Surface Safety Valves (SSV's) are not required because it has been demonstrated by performing fluid level tests that the wells are incapable of flow to the surface.

2.4.14 Spill Containment: In general, secondary spill containment, including earthen dikes and berms were in acceptable condition on both leases. Containment volume appeared to be sufficient. The PRC 735 Lease Tank Farm was surrounded with a berm with sufficient volume to contain the volume of the largest tank. The condition and elevation of the berm needs to be monitored and maintained. In a few spots, the repetitive walking of personnel in the same location has worn down the height of the berm. The PRC 3314 Lease has adequate berms that are in good condition around the stock tanks. The two tanks for the PRC 3314 are however, in the process of being dismantled and removed permanently.

2.4.15 Spill Response: The oil spill response equipment is located at the Colonia lease in an 8.5' x 20' trailer and was noted to be in good condition when examined at CSLC monthly and DOGGR quarterly inspections. The equipment required is well defined by federal and state regulations and is itemized in the Oil Spill Contingency Plan (OSCP). Oil absorbent pads are used for the initial response to minor containment and cleanup operations. The trailer is stocked with a variety of pollution control equipment that exceeds minimum equipment requirements. The inventory of these supplies are checked at the regular inspections and maintained. Operating personnel are considered to be the primary responders to minor onshore spills. For larger spills onshore, Venoco will use the Ventura based environmental contractors ACTI or ECI to help with early clean up.

2.5 Mechanical Integrity / Preventive Maintenance Program:

Operating personnel conduct preventative maintenance on all critical process and operational equipment. Major pieces of process equipment (i.e. vessels, tanks, piping, and machinery) are scheduled within the preventative maintenance program based on manufacturer's recommendations and operating history. The amount of equipment that is present is typical of a lease this size and is generally in good condition. The rotating equipment has its oil changed at prescribed intervals and the tanks and vessels are periodically inspected inside and out. Venoco appears to have a good preventative maintenance program established.

The Venoco work order system is handled by an in-house created software called Maintenance Track. Currently it is not fully implemented, and the only person who has access to it is the Venoco mechanic. It serves as a reminder system for work that needs to be done. In the near future, Venoco plans to bring the operators into most of the work and inspections that need to be done. Reports and work orders are published two weeks prior to the due date. Work orders include a list of the activities required for each task. This system seems to adequately provide maintenance tracking and scheduling for the facilities.

Administrative Factors

3.0 ADMINISTRATIVE AUDIT

3.1 Goals and Methodology:

The goal of the administrative audit (ADM) team was to verify the availability of and review the manuals, programs, procedures, and records required by Federal, State and local authorities as well as adherence to applicable industry standards. The primary emphasis of the ADM team was the evaluation of the required Operations Manual and the Facility Oil Spill Response Plan. A secondary effort was placed on the evaluation of other required or associated plans, manuals, policies, and documents that are needed for proper and safe facility operations. These included the operating manuals and training, drills and their applications. The latest hardcopy version of Venoco's Montalvo Facility Response Manual and Contingency Planning Information was reviewed as well as observing the application of policies and procedures at the facility.

3.2 Operations Manual:

At the time of the audit the Operations Procedure Manuals were being revised to show the modified and updated 735 facilities, as well as account for the anticipated increase in production from the re-drilling of wells into the 3314 PRC lease.

3.3 Spill Response Plan:

Venoco has an Oil Spill Response Plan (OSRP) that fulfills the requirements contained in the California Department of Fish and Game, Office of Spill Prevention and Response (OSPR) regulations, CCR Title 14, reg 817. The plan is also coordinated with the Federal Spill Prevention, Control, and Countermeasures Plan (SPCC) requirements that are contained in the EPA regulations, Title 40, CFR, 112.5. The SPCC is addressed in section 5.4.

The Venoco OSRP was found to be comprehensive and in a clear format. The plan contained the following required content:

- Facility description
- Hazards Evaluation Study and potential worst case spill scenario evaluation
- On-water containment and recovery procedures
- Shoreline protection and clean-up, and
- Response procedures.

The OSRP was thoroughly reviewed using CSLC checklists to verify that detailed content requirements were met. The oil spill response training and drill schedule was found to be up to date. It was last revised in January of 2010.

The OSRP was found to adequately address the policies and procedures to prevent, evaluate, contain, mitigate, and review the effects of unauthorized discharges. The manual included the required procedures including:

- On-water Containment and Recovery of Oil Spills
- Notification, Spill Response and Cleanup
- Shoreline Protection and Cleanup
- Waste Management Procedures
- Wildlife Care and Rehabilitation Procedures
- Hazardous Materials Communications and Training Program

3.4 Other Required Documents and Records:

Venoco has a number of regulatory agency required plans available at the Ventura Field office. These documents include a Business Emergency Plan (BEP), Spill Prevention Control and Countermeasure Plan (SPCC), the Emergency Response Plan (ERP) and a Safety and Health Manual. The manuals referenced were reviewed for content, accuracy and compliance with regulatory requirements.

The purpose of the BEP (California Code of Regulations, Title 19, 2729 & 2731) is to provide the local fire department jurisdiction with facility siting and a list of potentially hazardous materials and chemicals in the event of a fire or major incident. The information contained in the BEP is used by firefighters, health officials, planners, public safety officers, health care providers, regulatory agencies and other interested persons on the location, type, quantity, and the health risks of hazardous materials handled, used, stored, or disposed of by Venoco in order to prevent or mitigate the damage from the release, or threatened release of hazardous materials into the workplace and environment. It also provides guidance to Venoco personnel in their response to a release, or threatened release of hazardous chemicals, including evacuation procedures, maintaining an inventory of hazardous materials and provides guidance for cooperation with appropriate officials. A thorough review of Venoco's BEP found the information to be up-to-date. The Ventura County Environment Health Division works with and provides information to the Ventura County Fire Department and other agency responders to provide the chemical inventory and other hazards on the lease. Venoco does not therefore keep a copy for the responders at the entrance to the leases.

The SPCC appears to have been prepared and implemented as required by the U.S. Environmental Protection Agency (EPA) regulations contained in Title 40, Code of Federal Regulations, and Part 112. The plan contains procedures, methods and equipment to prevent the discharge of oil from facilities into navigable waters or adjoining shorelines. Review of the SPCC plan also found the document was up-to-date and typically contained accurate information.

Venoco's Emergency Response Plan (ERP) was developed to provide guidelines for management and employees who respond to abnormal events at the facility

(California Code of Regulations, Title 8, 3220 & 3221) or (Health & Safety Code, Title 19, 2729). The focus of the manual is to provide structure and guidance in the response actions required to effectively mitigate emergencies. The manual appears to have the required information and is organized in a logical manner.

3.5 Training, Drills, and Applications:

Venoco has a policy requiring all employees, contractors and visitors to receive safety orientation training and sign-in prior to entering an operating location. This policy provides a record that is used to account for personnel during an evacuation and enhances safety awareness and accountability. This system appears to be effective.

Venoco has an ongoing regulatory required training program for facility personnel and contractors. This training includes: confined space entry, oil spill drills, hazardous communications, HAZWOPER, hot / safe work permitting, H_2S, lockout / Tagout, and personal protective equipment. The program appears to include all mandatory training as required by OSHA and the Office of Spill Prevention and Response. The training matrix appears to be well defined and effective for each particular job description. A refresher course on fire-extinguishers is part of Venoco's "Block Training". Firefighting is encouraged only if the fire is small and can be safely done until the fire department arrives and takes over.

Drills, exercises, and safety meetings are conducted following an appropriate schedule. Facility personnel conduct morning safety meetings that include all persons performing work onsite. A range of general to specific safety subjects are addressed throughout the month and these training, and pre-job safety meetings are recorded and the records are retained for a predetermined amount of time. The audit team has observed that Venoco's personnel recognize the importance of PPE and that the requirements are strictly enforced. There were no action items identified regarding these personnel protective safety devices or equipment.

Human Factors

4.0 HUMAN FACTORS AUDIT:

4.1 Goals of the Human Factors Audit:

The primary goal of the Human Factors Team is to evaluate the operating company's human and organizational factors by using the Safety Assessment of Management Systems (SAMS) interview process. The SAMS is planned to be conducted following audits of the Venoco state lease facilities. Results of this team's work will be considered confidential between CSLC, and Venoco and will be contained in a separate report.

SAMS was developed under the sponsorship of government agencies and oil companies from the United States, Canada, and the United Kingdom to assess organizational factors, enabling companies to reduce organizational errors, reduce the risk of environmental accidents, and increase safety. The assessment was divided into nine major categories to examine the following areas (The number of sub-categories or areas of assessment for each category are included in parentheses.):

- Management and Organizational Issues (9),
- Hazards Analysis (9),
- Management of Change (8),
- Operating Procedures (7),
- Safe Work Practices (5),
- Training and Selection (14),
- Mechanical Integrity (12),
- Emergency Response (8), and
- Investigation and Audit (9).

Assessment of each of the sub-categories is derived from one main question with a number of associated and detailed questions to help better define the issues.

The SAMS process is not intended to generate a list of action items. Its purpose is to provide the company with a confidential assessment of where it stands in developing and implementing its safety culture and a benchmark for future assessments.

4.2 Human Factors Audit Methodology:

The CSLC Mineral Resources Management Division will schedule the SAMS interviews with Venoco staff and sub-contractors after completion of the safety and oil spill prevention audit. The assessors will evaluate the responses based on SAMS guidelines and develop a separate confidential report. The MRMD staff will provide the confidential report accompanied by a formal presentation that summarizes the report to Venoco management.

Appendices

TEAM MEMBERS

EQUIPMENT FUNCTIONALITY AND INTEGRITY TEAM

CSLC – MRMD	Mark Steinhilber Craig Webster Daryl Hutchins
VENOCO	Joe Hollis

TECHNICAL TEAM

CSLC – MRMD	Mark Steinhilber Craig Webster Daryl Hutchins
VENOCO	Joe Hollis

ADMINISTRATIVE TEAM

CSLC – MRMD	Mark Steinhilber Craig Webster Daryl Hutchins
VENOCO	Joe Hollis

ACRONYMS

ADM	Administration
ANSI	American National Standards Institute
API	American Petroleum Institute
BAT	Best Achievable Technology
CEC	California Electrical Code
CFC	California Fire Code
CSLC	California State Lands Commission
EFI	Equipment Functionality and Integrity
ELC	Electrical
ESD	Emergency Shutdown
ESP	Electric Submersible Pump
FSL	Flow Safety Low
FSV	Flow Safety Valve
HF	Human Factor
H_2S	Hydrogen Sulfide
kVA	KiloVolt Amperes
kW	Kilowatts
LACT	Lease Automatic Custody Transfer
MOC	Management of Change
MRMD	Mineral Resources Management Division
NEC	National Electrical Code
NFPA	National Fire Protection Association
OSHA	California Occupational Safety & Health Administration
OSPR	Office of Spill Prevention and Response
P&ID	Piping and Instrumentation Diagrams
PHA	Process Hazard Analysis
PM	Preventative Maintenance
PPE	Personal Protective Equipment
PRC	Public Resources Code
PSH	Pressure Safety High
PSHL	Pressure Safety High-Low
Psi	Pounds per Square Inch
PSL	Pressure Safety Low
PSM	Process Safety Management
PSV	Pressure Safety Valve
RP	Recommended Practice
SAFE	Safety Analysis Function Evaluation
SAC	Safety Analysis Checklist
SAMS	Safety Assessment of Management Systems
SCADA	Supervisory Control and Data Acquisition
SCBA	Self Contained Breathing Apparatus
SCE	Southern California Edison
SSV	Surface Safety Valve
TEC	Technical
UBC	Uniform Building Code
UFC	Uniform Fire Code
VSD	Variable Speed Drive

REFERENCES

GOVERNMENT CODES, RULES, AND REGULATIONS

Cal OSHA California Occupational Health and Safety

3215	*Means of Egress*
3222	*Arrangement and Distance to Exits*
3225	*Maintenance and Access to Exits*
3308	*Hot Pipes and Hot Surfaces*
3340	*Accident Prevention Signs*
5189	*Process Safety Management of Acutely Hazardous Materials*
6533	*Pipe Lines, Fittings, and Valves*
6551	*Vessels, Boilers and Pressure Relief Devices*
6556	*Identification of Wells and Equipment*

CCR California Code of Regulations

1722.1.1	*Well and Operator Identification*
1774	*Oil Field Facilities and Equipment Maintenance*
1900-2954	*California State Lands Commission, Mineral Resources Management Division Regulations*

CFR Code of Federal Regulations

29 CFR	*Part 1910.119 Process Safety management of Highly Hazardous Chemicals*
30 CFR	*Part 250 Oil and Gas Sulphur Regulations in the Outer Continental Shelf*
33 CFR	*Chapter I, Subchapter N Artificial Islands and Fixed Structures on the Outer Continental Shelf*
40 CFR	*Part 112, Chapter I, Subchapter D Oil Pollution Prevention*
49 CFR	*Part 192, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standard*
49 CFR	*Part 195, Transportation of Liquids by Pipeline*

INDUSTRY CODES, STANDARDS, AND RECOMMENDED PRACTICES

ANSI American National Standards Institute

B31.3	*Petroleum Refinery Piping*
B31.4	*Liquid petroleum Transportation Piping Systems*
B31.8	*Gas Transmission and Distribution Piping Systems*
Y32.11	*Graphical Symbols for Process Flow Diagrams*

API American Petroleum Institute

RP 14B	*Design, Installation and Operation of Sub-Surface Safety Valve Systems*

RP 14C	*Analysis, Design, Installation, and Testing of Basic Surface Safety Systems for Offshore Production Platforms*
RP 14E	*Design and Installation of Offshore Production Platform Piping Systems*
RP 14F	*Design and Installation of Electrical Systems for Offshore Production Platforms*
RP 14G	*Fire Prevention and Control on Open Type Offshore Production Platforms*
RP 14H	*Use of Surface Safety Valves and Underwater Safety Valves Offshore*
RP 14J	*Design and Hazards Analysis for Offshore Production Facilities*
RP 51	*Onshore Oil and Gas Production Practices for Protection of the Environment*
RP 55	*Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide*
RP 500	*Classification of Locations for Electrical Installations at Petroleum Facilities*
RP 505	*Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1, and Zone 2*
API 510	*Pressure Vessel Inspection Code: Maintenance Inspection, Rating, Repair, and Alteration*
RP 520	*Design and Installation of Pressure Relieving Systems in Refineries, Parts I and II*
RP 521	*Guide for Pressure-Relieving and Depressuring Systems*
RP 540	*Electrical Installations in Petroleum Processing Plants*
RP 550	*Manual on Installation of Refinery Instruments and Control Systems*
RP 570	*Piping Inspection Code*
RP 651	*Cathodic Protection of Aboveground Petroleum Storage Tanks*
Spec 6A	*Wellhead Equipment*
Spec 6D	*Pipeline Valves, End Closures, Connectors, and Swivels*
Spec 12B	*Specification for Bolted Tanks for Storage of Production Liquids*
Spec 12J	*Specification for Oil and Gas Separators*
Spec 12R1	*Recommended Practice for Setting, Maintenance, Inspection, Operation, and Repair of Tanks in Production Service*
Spec 14A	*Subsurface Safety Valve Equipment*

ASME American Society of Mechanical Engineers

Boiler and Pressure Vessel Code, Section VIII, "Pressure Vessels," Divisions 1 and 2

ISA Instrument Society of America

55.1	*Instrument Symbols and Identification*
102-198X	*Standard for Gas Detector Tube Units – Short Term Type for Toxic Gases and Vapors in Working Environments*
S12.15	*Part I, Performance Requirements, Hydrogen Sulfide Gas Detectors*
S12.15	*Part II, Installation, Operation, and maintenance of Hydrogen Sulfide Gas Detection Instruments*
S12.13	*Part I, Performance Requirements, Combustible Gas Detectors*

	S12.13	*Part II, Installation, Operation, and Maintenance of Combustible Gas Detection Instruments*
NACE		National Association of Corrosion Engineers
	RPO169	*Control of External Corrosion on Underground or Submerged Metallic Piping Systems*
NFPA		National Fire Protection Agency
	20	*Stationary Pumps for Fire Detection*
	25	*Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*
	70	*National Electric Code*
	704	*Identification of the Hazards of Materials for Emergency Response*
CEC		California Electric Code