MINUTE ITEM
This Calendar Item No. 80
was submitted for information
only, no action thereon

Minute Item
80

04/26/05
W 40908
P. Johnson

CALIFORNIA STATE LANDS COMMISSION
(INFORMATIONAL)

Item 80 was INFORMATIONAL only. No vote was taken.

CALENDAR ITEM
80

A 57, 58

S 29

04/26/05
W 40908
P. Johnson

STAFF REPORT ON THE WELL CONTROL INCIDENT ON OUTER CONTINENTAL SHELF PLATFORM GAIL ON NOVEMBER 18, 2004, SOCKEYE FIELD, CHANNEL ISLANDS BLOCK 4661, LEASE OCS-P 0205, VENTURA COUNTY

PARTY:

California State Lands Commission
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202

BACKGROUND:

During the December 2004 California State Lands Commission (Commission) meeting, staff was directed to report on the cause of the incident which led to a loss of well control on Platform Gail on Federal Lease OCS-P 0205, and to report on whether existing regulations would prevent occurrence of a similar incident on State leases. The Minerals Management Service (MMS), Pacific OCS Region conducted a thorough investigation of the incident and released a report in February 2005. Mineral Resources Management Division (MRMD) staff has reviewed the report and concurs with MMS conclusions. This item summarizes the MMS report and MRMD actions taken to prevent similar incidents on State leases.

The well control incident on Platform Gail occurred on November 18, 2004, during the final stages of a workover operation on Well E-15 that was being performed by the lessee, Venoco, Inc., to increase the oil production rate from the well. During all workover operations such as this, it is a normal practice to control a well's tendency to flow reservoir fluids to the surface by continuously pumping seawater or other heavy fluids into and down the well's steel casing. While working on Well E-15, seawater pumping was shut off by the well work personnel to allow them to remove a large metal lockdown pin from the side of the wellhead. This was done to enable the crew to look into the threaded hole

where the pin was, and visually determine if the tubing hanger within the wellhead was in the correct position. During the time that the pumping had ceased, the seawater level in the well had dropped to where it could no longer hold back the well's natural pressure, resulting in oil and water entering the well from the reservoir and rising to the surface. The fluids reached the surface and exited the well through the 1½-inch lockdown pin opening in the wellhead. Since the pin opening was located below the Blow Out Prevention Equipment (BOPE) stack, containment was lost, and well fluids began to spray onto grating, decking, and the walls of the wellbay. Natural gas containing Hydrogen Sulfide (H_2S) also escaped from the lockdown pinhole.

The fire-extinguishing deluge system was activated to suppress ignition of the escaping gas. Platform operations were shut down manually when low level combustible gas and H_2S monitors went off. The abandon platform alarm was sounded and all non-essential personnel were evacuated using the platform escape capsules. Twelve persons stayed aboard to respond to the release. Although initial efforts to replace the pin were unsuccessful due to the force of fluids exiting the hole, the release was eventually controlled by screwing a valve assembly turned to the open position into the lockdown pin hole, and then closing the valve, securing the well.

During the 2 ½ hours of uncontrolled flow, three (3) barrels of oil, an unknown amount of completion water and well water, and an unknown amount of sour gas were released. In addition, water from the deluge system flooded the deck due to a plugged deck drain, and approximately three (3) gallons of crude oil and an unknown amount of water went into the ocean. The USCG transferred the personnel who had evacuated from the escape capsules to boats for transit to shore.

No injuries to personnel occurred. No harm to wildlife was observed.

FINDINGS:

Causes: The MMS identified two direct causes of the Platform Gail incident. First, primary well control was lost when the workover rig crew neglected to keep the wellbore full of seawater to maintain control of the pressure. Second, the capability of the BOPE to contain well pressure was defeated when the lockdown pin below the BOPE stack was completely removed. The overwhelming indicator in both causes is human error. Contributing causes were failure to follow established field rules, failure to follow the manufacturer's recommended procedures for landing the split tubing hanger, failure to closely monitor the

wellbore for flow, and failure to provide adequate supervision to contract personnel placed in charge of the operation.

Mineral Resources Management Division staff concurs with the MMS conclusions.

Pertinent CSLC Regulations: The following CSLC regulations prohibit or should preclude an occurrence similar to the release on Platform Gail in operations on State leases:

- Title 2, California Code of Regulations, Section 2136 is a general prohibition of pollution forbidding the release of oil into the ocean.
- Title 2, California Code of Regulations, Section 2129(c) requires all production operations on State leases to be conducted in accordance with accepted good oilfield practices.
- Title 2, California Code of Regulations, Section 2132(b)(4) specifies minimum blowout prevention equipment to be used during well workover operations.
- Title 2, California Code of Regulations, Section 2132(c)(1) requires full-time onsite company supervision of well perforating operations.
- Title 2, California Code of Regulations, Section 2132(c)(2) requires constant surveillance of the well during operations.
- Title 2, California Code of Regulations, Section 2132(c)(3) requires that lessee and contractor supervisory personnel and crew chiefs for workover operations be trained and qualified in well control equipment, operations, and techniques. These persons shall successfully complete a basic well control course every four years and take a refresher course each year. The basic and refresher course curricula shall be approved by Staff.

Similar regulations can be found in 30 Code of Federal Regulations, Part 250, the MMS regulations governing rig operations on Platform Gail.

Human Organizational Factors: As stated above, the primary cause of the release on Platform Gail was human error. Mistakes were made in applying required well control training, fundamental precepts of well control were not followed, lapses in supervision were allowed to occur, and misguided directions were given which rendered the blowout prevention equipment useless in controlling the release.

Design Factors: A further cause not explicitly named in the MMS investigation is the tubing head and split hanger design, which results in a landing procedure

that requires both accurate measurement between the wellhead on the production deck and the workover rig floor on the drilling deck above, and experienced and delicate control of the rig hoist.

MRMD Response Plan: MRMD has initiated the following efforts to prevent similar incidents on State leases:

- The MMS report "Investigation of Loss of Well Control and Oil Spill, Platform Gail, Channel Islands Block 4661, Lease OCS-P 0205, November 18, 2004", OCS Report MMS 2005-017 has been reviewed and evaluated. Further interviews with MMS and Venoco personnel have been conducted to clarify details of the report. MRMD staff concurs with the MMS conclusions.

- Existing CSLC regulations concerning well control equipment, training, and supervision requirements during workover operations have been re-examined for sufficiency. MRMD staff believes that additional regulations or modifications of existing regulations will not improve protection from similar incidents on State Leases.

- Curricula of well control training courses for workover operations taken by lessee and contractor personnel are in the process of review to ensure technical quality and that adequate emphasis is given to human error. Attendance of training classes by MRMD personnel will be included in this evaluation to evaluate quality of instruction. Additions to or improvements of the well control training courses will be required as necessary.

- Both the MMS Safety Alert Notice and Investigation Report concerning the incident on Platform Gail have been sent to all operators of State offshore leases. Individual workshops with each operator of an offshore State lease will be conducted to evaluate the procedures used to ensure that required training is received, that proper procedures are applied, and that adequate supervision is provided during workover operations. Topics of discussion at these meetings will include: well control equipment, training, and supervision requirements for workover operations, equipment and procedures used to monitor the wellbore for flow or loss during workover operations, configuration and use of choke and kill lines during workover operations, tubing head/hanger design specifics used on lease wellheads and procedures for landing tubing in these assemblies that maintain well control, communication between drilling deck and production deck during

workover operations, lessee / rig representative / rig contractor arrangements and responsibilities in practice at the State lease, lessee and contractor quality assurance programs that ensure compliance with accepted procedures and proper qualifications and training of personnel involved in workover operations, and lessee and contractor internal audit programs that promote continued improvement in compliance.

Since existing regulations provide comprehensive protection from loss of well control, and additional or more explicit regulations will not prevent mistakes from being repeated, this response plan is geared toward strengthening the human side of the equation. The goal of this effort is to ensure compliance with CSLC regulations concerning well control equipment, training, and supervision, promote proper mechanical procedures for installation and removal of down hole and surface well equipment, and to reduce the likelihood of human error in conducting well workover and well control procedures on State leases.

EXHIBITS:

A. Location Map
B. MMS Safety Alert Notice No. 18
C. OCS Report MMS 2005-017

PERMIT STREAMLINING ACT DEADLINE:

N/A

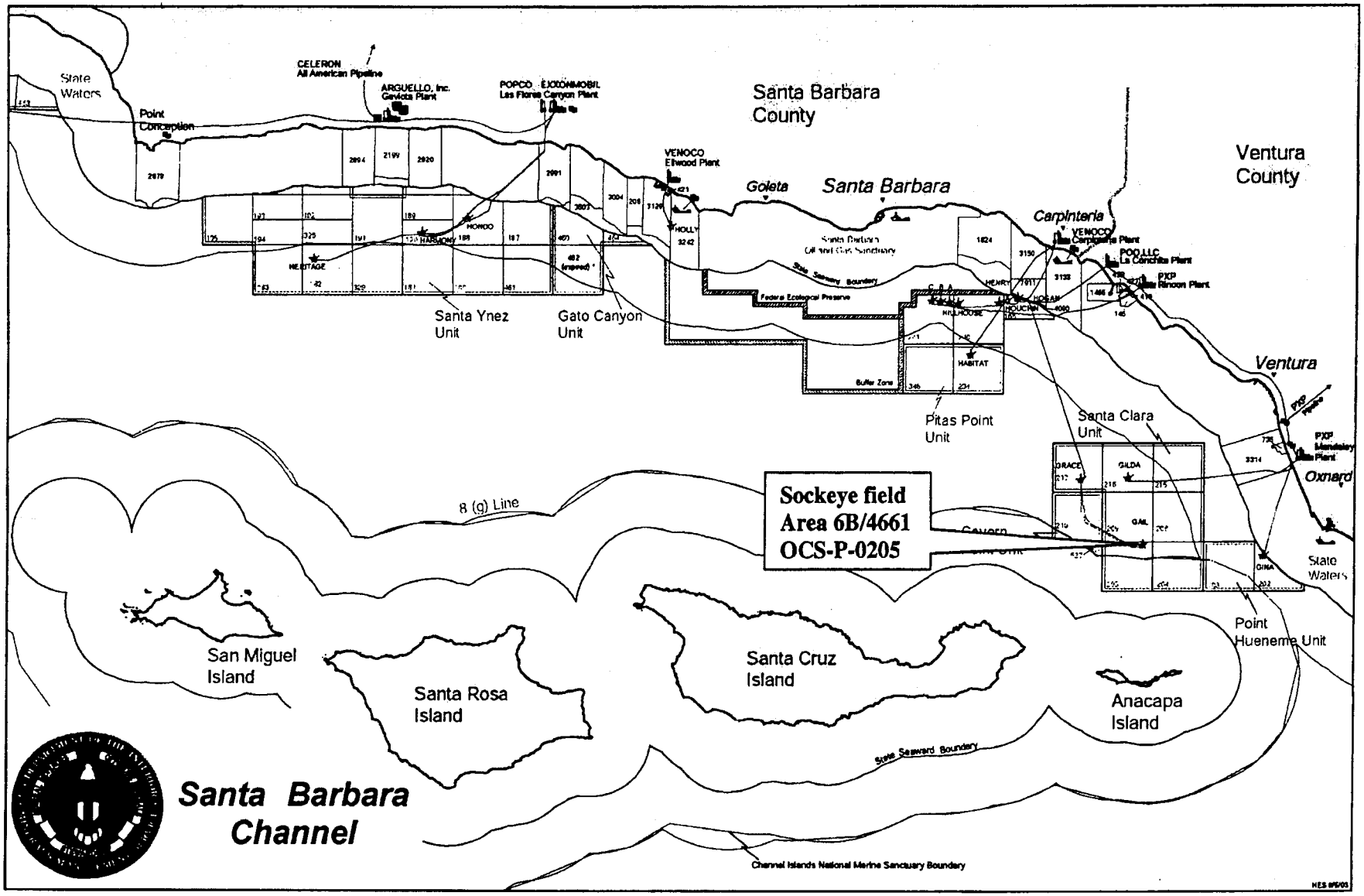


Figure 2. Locations of Units in the Santa Barbara Channel

Source: MMS 12-1-2004

Exhibit A
Location Map

W 40908

CALENDAR PAGE 000448
MINUTE PAGE 000795

EXHIBIT B

Safety Alerts

MMS

U.S. Department of the Interior
Minerals Management Service
Pacific OCS Region

Safety Alert

Notice No. 18
February 18, 2005

WELL-CONTROL EQUIPMENT CIRCUMVENTION

An operator experienced a loss of well control while performing a workover/completion operation. During the operation, completion fluid pumping was shut off so that a tubing hanger lockdown pin could be removed from the wellhead to allow visual alignment of the tubing hanger. Removal of the pin circumvented the blowout prevention well-control equipment. The well began to flow through the lockdown pin opening. The driller closed the annular preventer, but this increased the flowing pressure out of the 1.5-inch opening, preventing rethreading of the pin back into the tubing hanger.

The well progressively flowed completion fluid (seawater) and then a mixture of seawater and hydrocarbons out of the opening. Up to three barrels of crude oil sprayed onto grating, decking, and walls in the wellbay, with an estimated three gallons spilling into the Pacific Ocean. Natural gas was discharged in the general direction of the flare boom, increasing the potential for ignition. Platform personnel manually shut down operations and activated the deluge system. The flare, which continued to burn residual system process gas after the platform shutdown, was eventually extinguished with dry chemical extinguishers, preventing potential ignition of the gas plume by the flare. Rig pumps were used to pump seawater into the well through the kill line on the blowout preventer stack until the flow rate through the lockdown pin opening decreased enough to allow installation of a valve assembly; the valve was then closed, stopping the flow from the well.

An MMS investigation of the incident identified two direct causes and four possible contributing causes:

Direct causes

1. The rig personnel stopped pumping completion fluids into the well which caused an imbalance in the hydrostatic pressure against the Monterey Formation,

allowing the well fluids to migrate up through the piping to the wellhead on the platform.

2. The tubing hanger lockdown pin was completely removed from the wellhead assembly. Removal of this pin circumvented the blowout preventer system and provided an exit point for the wellbore fluids.

Potential causes

3. The operator and its contractors did not adhere to the MMS-approved Application for Permit to Modify (form MMS-124) and field rules. This allowed conditions to develop that were conducive to well-control problems.
4. Inadequate and/or inappropriate training with respect to performing the inherently unsafe operation of removing the lockdown pin may have contributed to the incident.
5. The well was not closely monitored for flow or fluid level during the split tubing hanger landing operation. A lack of immediate appropriate action by the rig crew may have resulted from this inattentiveness to developing well conditions.
6. The operator relied upon their contractors' extensive experience to perform the job correctly. However, the operator provided inadequate supervision to the contractors. In addition, the operator and contractors failed to complete a Job Safety Analysis for this operation.

Therefore, MMS recommends that:

1. Lessees and operators develop specific procedures or revise existing procedures for landing dual string casing hangers so that circumvention of the well-control system is eliminated.
2. Well-control training and safety meetings cover potential consequences of well-control system circumvention.
3. Operators review and/or provide detailed work procedures to be used by company and contract employees.
4. Rig crews and third-party personnel be instructed to conform to approved Applications for Permit to Modify and field rules.
5. Job Safety Analyses be conducted for all tasks involving potential hazards.

This Safety Alert can be found on our Website at: http://www.mms.gov/omm/pacific/offshore/safety/satoc.htm

W 40908

Exhibit C

OCS Report
MMS 2005-017

Investigation of Loss of Well Control and Oil Spill, Platform Gail, Channel Islands Block 4661, Lease OCS-P 0205, November 18, 2004

Pacific OCS Region
Off the Coast of California

Prepared By

Dan Knowlson
Shannon Shaw
Ralph Vasquez

U.S. Department of the Interior
Minerals Management Service
Pacific OCS Region

Camarillo, CA
February, 2005

000451
CALENDAR PAGE

000733
MINUTE PAGE

Contents

Introduction
-Authority....2
-Accident Investigation Team Members....2
-Procedures....2
Investigation and Report
-Brief Description of Incident....3
-Background....3
Findings
-Incident....5
-Training, Experience and Drills....6
-Well Control....6
-Hydrogen Sulfide....6
-Oil Spill Response....7
-Platform Evacuation....7
-Safety Issues
-History of Dual String Completion Running Procedures....7
-Operations Management Oversight....8
-Engineering Review....8
-On-Scene Findings....8
-United States Coast Guard (USCG) Findings....9
Conclusion
-Causes....10
-Possible Contributing Causes....10
-Venoco's Analysis and Corrective Action....10
Recommendations
-MMS Actions....13
-Incidents of Noncompliance (INC's) and Potential INC's (PINC's)....12
-Safety Alert....12
-MMS Regulations....13
-Other MMS Actions....13
-Venoco Actions....14
Appendix
-Application for Permit to Modify (public copy)
-INC's Issued
-Field Map
-USCG Report
-Wellhead Schematic
-Wellbay Diagrams
-Photos

Introduction

Authority

Outer Continental Shelf Lands Act (OCSLA), as amended, Title 43, USC Section 1348(d).

Accident Investigation Team Members

By memorandum dated November 19, 2004, from the MMS Pacific OCS Region Camarillo District Manager, the following MMS and USCG personnel were named to perform the investigation:

Dan Knowlson – Santa Maria District, Pacific OCS Region, MMS

Shannon Shaw – Camarillo District, Pacific OCS Region, MMS

Ralph Vasquez – Camarillo District, Pacific OCS Region, MMS

Chris Smith – Marine Safety Detachment, USCG

Procedures

On November 19, 2004, the investigative team visited the site of the accident to gather information, photograph the site, inspect the layout of the platform, and conduct interviews. Additional interviews were conducted later.

000453
CALENDAR PAGE

000800
MINUTE PAGE

Investigation and Report

Brief Description of Incident

On November 18, 2004, at about 9:45 a.m., a loss of well control occurred during a recompletion operation on Well E-15 at Platform Gail. Pumping of completion fluids (seawater) into the well had been shut off so that a tubing hanger lockdown pin could be removed from the wellhead assembly to facilitate visual alignment of a split tubing hanger. An underbalanced pressure condition developed, resulting in a kick as formation fluids entered the well and migrated uphole. The fluids reached the surface and exited the well through the lockdown pin opening in the wellhead. Removal of the pin circumvented the blowout preventer (BOP) system. The well flowed unabated through the 1 ½-inch diameter hole; first completion fluid, then gas and oil. The deluge system was manually activated in all areas where gas might be present to help prevent ignition of the gas. Platform operations were manually shut down in their entirety upon receiving signals from LEL (lower explosive limit)/combustible gas and H_2S (hydrogen sulfide) detectors indicating the presence of these substances in the area of the release. The abandon platform alarm was sounded and 39 non-essential personnel were evacuated using two escape capsules. Twelve essential personnel remained on board the platform. The platform flare continued to burn off residual gas after platform operations were shut down. Fearing that it might ignite the gas being released from the wellbay, personnel attempted to manually extinguish the flare using a fire hose and dry chemical extinguishers. The pumping of seawater into the well was resumed, and attempts were made by personnel to place the pin back into the hole or to install a valve assembly in the open position before they were successful with the latter procedure. The valve in this assembly was then closed, securing the well.

Approximately 3 barrels of crude oil escaped through the lockdown pin hole during the incident and sprayed onto grating, decking, and walls in the wellbay. At the same time, the deluge system flooded the area with water at an approximate rate of 6000 gallons per minute. Debris clogged a filter screen in the deck drainage system, causing an overflow of the deck containment system (curbing) which resulted in a spill of an estimated 3 gallons of crude oil along with an undetermined amount of deluge water into the ocean.

No injuries to personnel occurred. No harm to seabirds or other wildlife was observed.

Background

Lease OCS-P 0205 covers approximately 5,760 acres and is located in the Santa Barbara Channel. The lease was issued to Humble Oil & Refining Company and to Standard Oil Company of California in1968. Humble Oil & Refining Company changed its name to Exxon Corporation on January 1, 1973. On February 1, 1977, Standard Oil Company of California transferred 100% interest to Chevron U.S.A. Inc. On November 1, 1990, Exxon assigned all of its interest to Chevron U.S.A. Inc. On February 1, 1999, Chevron U.S.A. Inc. assigned all of its interest to Venoco, Inc., resulting in 100% ownership.

The well was completed as a dual string completion years ago, and on October 28, 2004, the operator submitted and received approval for an Application for Permit to Modify (APM) to

restore production in the Lower Topanga Formation interval (long string) and reperforate and acidize the Monterey Formation interval (short string). During the incident, the Lower Topanga zone was isolated from the surface, while the Monterey zone was open and provided the sole source of hydrocarbon flow for the duration of the event.

Findings

Incident

On November 18, 2004, at about 9:45 a.m., a loss of well control occurred at Platform Gail during a recompletion operation on Well E-15 when a contracted wellhead service technician from Elco, Incorporated completely removed a 1½-inch diameter lockdown pin and packing-gland from the wellhead. The pin was removed to facilitate visual alignment during landing operations of the split tubing hanger. The pin is only supposed to be partially screwed in or out, not completely removed. Removal of this pin circumvented the blowout preventer (BOP) system.

The continuous pumping of well completion fluids (seawater) into the well at a rate of 2.6 barrels per minute to maintain hydrostatic overbalance was discontinued for an estimated 20 to 40 minutes to allow removal of the pin, but an underbalanced condition developed. Hydrocarbon fluids from open perforations in the Monterey Formation flowed to the surface, expelling completion fluid through the lockdown pin opening. The ensuing flow turned into a mixture of seawater, gas, and oil.

Upon realizing that the well was flowing, the Elco technician alerted rig personnel of the problem and attempted to replace the pin. At this time, the driller closed the annular preventer because the toolpusher observed completion fluid rising in the BOP stack. This action successfully prevented the well from flowing up onto the rig floor. However, it also caused increased flow and pressure out of the lockdown pin opening, further complicating efforts to reinsert the lockdown pin. A 2-inch diameter valve on the 9 ⅝-inch casing was opened in an attempt to relieve pressure and flow through the lockdown pin opening. This approach was not successful, and the valve was inadvertently left open for a short time which temporarily increased flow from the well.

The deluge system was manually activated in all areas where gas might be present to help prevent ignition of the gas. Platform operations were manually shut down in their entirety upon receiving signals from LEL (lower explosive limit)/combustible gas and H_2S (hydrogen sulfide) detectors indicating the presence of these substances in the area of the release.

The abandon-platform alarm was sounded and 39 non-essential personnel were evacuated from the platform via two escape capsules. Twelve essential personnel remained on board the platform. Precautions for working in an H_2S environment were taken by all personnel including the initial emergency response team (ERT). These precautions included having self-contained-breathing-air (SCBA) apparatus at the ready if needed and donned while working in proximity of the release. The platform flare continued to burn off residual process gas after the platform was shut down. Fearing that it might ignite the gas which was being released in the vicinity and direction of the flare stack, personnel attempted to douse the flare stack using firewater hoses/monitors and dry chemical extinguishers. The flare was eventually extinguished, after much difficulty.

000456
CALENDAR PAGE

000603
MINUTE PAGE

Upon initial entry into the upper wellbay, the ERT took readings of 0% LEL and 0 parts per million (ppm) H_2S using a handheld detector. Their second reading at that location indicated 5 ppm H_2S. A third reading, taken in the lower wellbay, registered 63 ppm H_2S. Another reading at that location taken 10 minutes later indicated 10 ppm H_2S. Entry was then made into the lower wellbay to isolate the 9 ⅝-inch casing valve which had been left open.

Drilling rig pumps were activated and sea water was pumped into the well through the kill line in the BOP stack at a high flow rate. The rate of leakage eventually subsided enough to attempt installation of a valve assembly in the open position in the lockdown pin opening. Several attempts were made before the crew successfully installed and then closed the valve assembly, securing the well. The H_2S concentration at the wellhead in the upper wellbay when the valve assembly was installed was 0 ppm.

The well flowed in an uncontrolled manner for about 2 ½ hours. Approximately 3 barrels of crude oil escaped through the lockdown pin opening during the incident and sprayed onto grating, decking, and walls in the wellbay. At the same time, the deluge system doused the area with firewater at an approximate rate of 6000 gallons per minute. Debris clogged a filter screen in the deck drainage system, causing a mixture of crude oil, sea water, and debris to overflow the deck containment system (curbing), which resulted in a spill estimated at 3 gallons of crude oil, along with an undetermined amount of deluge water (seawater), into the ocean.

No injuries to personnel or damage to the facility were reported. No harm to seabirds or other wildlife was observed. Most of the estimated 3 gallons of crude oil that went overboard was recovered using sorbent booms.

Training, Experience and Drills

Well Control

Venoco has adopted the California Offshore Operators Well Control and Production Safety Training Plan (COOP) as their basis for meeting the requirements set forth in 30 CFR 250 Subpart O, Well Control and Production Safety Training. Subpart O requirements are performance-based and are overseen in the MMS POCSR by the Office of Facilities, Safety, and Enforcement. There is no indication of any problems during this incident which could be directly related to the operator's well control training plan. The well-head technician that actually pulled the lockdown pin did not have well control training, but he was directly supervised by the foreman, tool-pusher, and driller, all of whom did have the necessary training.

Hydrogen Sulfide (H_2S)

All personnel on the platform receive H_2S training before beginning work at the facility and at least once each year thereafter, within 1 year's time of their previous training. Training includes the location and use of respirators, evacuation procedures, location of safe briefing areas, alarm system, hazards of H_2S and SO_2, and instructions on their responsibilities in the event of an H_2S release. Additionally, H_2S drills are conducted at least once per week with full participation by all personnel onboard. Safety meeting topics include discussions of H_2S drill performance, and

new or updated H_2S considerations or information on a monthly basis. H_2S precautions, training and drills are conducted in accordance with 30 CFR 250.490. Although the well had potential for an H_2S concentration up to 6000 ppm, the highest concentration observed during the incident was measured at 63 ppm with a portable handheld detector. As a result of their extensive training and exercises for H_2S emergencies, adequate H_2S precautions were taken by all personnel onboard the platform.

Oil Spill Response

Venoco conducts training and exercises for all response personnel annually pursuant to 30 CFR 254.41 and 254.42. For this incident, Venoco chose to mobilize its Spill Management Team at the Clean Seas equipment yard per its MMS-approved Oil Spill Response Plan. An estimated three gallons of crude were spilled into the Pacific Ocean and adequate response and cleanup operations were initiated to recover the oil. The oil spill cooperative organization Clean Seas responded and the Oil Spill Response Vessel Mr. Clean, onsite for the incident, deployed sorbent boom which was adequate for complete cleanup.

Platform Evacuation

In accordance with their Emergency Evacuation Plan, the operator conducted an emergency evacuation of all non-essential personnel from the platform via Whitaker Escape Capsules. The USCG assisted in transferring personnel from the escape capsules to boats for transit to shore. Venoco was commended by both the MMS and USCG for their efforts in preparing for and accomplishing an exceptionally risky evacuation operation which required knowledge, experience, and cooperation by all personnel involved.

According to USCG regulations found at 33 CFR 146.125, platform operators are required to perform monthly emergency evacuation drills. These drills along with all of the associated and extensive training given to platform personnel are credited for achieving a very successful evacuation of all non-essential personnel from the platform.

Safety Issues

History of Dual-String Completion Running Procedures

The procedure of pulling the lockdown pin had been used in the past on some workovers associated with dual-string completions without incident. It should be noted that the lockdown pin was not designed for this purpose nor does the manufacturer of the wellhead, FMC Technologies, recommend it. The pin was designed to be backed in and out of the wellhead to secure the tubing hanger without breaching the pressure integrity of the wellhead.

Apparently, the pin pulling procedure evolved to assist in aligning the split hanger, to verify that the hanger was set in the correct position. If the split tubing hanger is slightly misaligned, it could cause critical damage and added expense for additional rig time to correct problems. Prior to use of the lockdown pin pulling procedure, a mechanical finesse and measurement system was used to set dual string tubing completions.

Operations Management Oversight

Typical of the majority of facilities offshore California, Venoco hires third-party contractors as rig foremen who act as their representatives during rig operations. This is a common practice among independent operators due to sporadic operational needs. Supervisory contract personnel have been found to be extremely experienced, well trained, and especially capable of performing the duties required for their positions. In this instance, the rig foreman decided to allow a risky operation without consulting the operator's engineering staff or MMS-approved written procedures.

The written procedures were detailed but did not contain explicit information on tubing setting operations nor were they required to by regulation to contain such information. The regulation at 30 CFR 250.613(b)(1) states that a "brief description of the well-workover procedures to be followed" is to be included in the APM submitted for approval. The approved procedures did contain sufficient detail for MMS regulatory purposes. Also, the MMS-approved procedures submitted by Venoco did specify the following: "Sufficient fluid will be pumped into the well to keep the well under control per the field rules." Had Venoco abided by this measure, the incident would most likely not have occurred, and the pin pulling procedure would not have come to our attention.

Engineering Review

In light of the inherent risk of pulling the lockdown pin, it is difficult to understand or explain how this action could occur without sufficient engineering review. Apparently, the contract rig foreman and crews were hired to perform an objective but were provided minimal supervision by Venoco. The operator relied upon its contractors' extensive experience to have the job performed correctly. Rig foremen usually inform Venoco personnel if they encounter any problems during actual operations. The foreman in this case, although admittedly uncomfortable with the planned procedure to pull the pin, did not recognize this procedure to be worthy of review and approval by operator personnel. The foreman did discuss the procedure with his crew and decided to proceed since it had been successful in the past.

<u>On-Scene Findings</u>

An MMS/USCG accident investigation team flew to the platform on November 19, 2004. The team consisted of MMS employees (Dan Knowlson, Petroleum Engineer; Shannon Shaw, Petroleum Engineer; and Ralph Vasquez, Supervisory Inspector) and a USCG representative (Chris Smith, Marine Science Technician). Platform Gail remained shut in following the incident and during the investigation visit, awaiting approval from MMS to resume production and recompletion operations. Cleanup operations were underway on the production deck and sump deck.

In the wellbay, the investigative team examined the wellhead of Well E-15, as well as the lockdown pin and valve assembly utilized to plug the lockdown pin opening and secure the well. The team also surveyed the area and took photographs around the wellhead in the upper and lower parts of the wellbay, including photographs of other wellheads, grating, decking, and walls

that were subjected to the oily discharge from the well. All surfaces in the immediate area of the well were covered with a thick, oily residue, but no actual damage to any of these components was found.

The team examined the blowout preventer stack as well as the drilling rig being used to conduct the recompletion operation, with no irregularities or items of concern noted.

The team conducted interviews of key personnel involved in the incident including the drilling foreman, platform supervisor, control room and wellbay operators, instrumentation specialists, and emergency response team members.

The team collected photocopies of documents including platform alarm summaries, wellbay diagrams, drilling reports, personnel manifests, and equipment schematics.

The team confirmed that the platform evacuation and lifesaving equipment used during the incident response had been replaced and left in a ready condition. A strong odor of vomit was detected, probably a result of seasickness in some of the personnel in the escape capsules.

As a result of the initial investigation, the team issued to the operator a Notification of Incidents of Noncompliance (INC) with the following two citations:

- INC E-100, a violation of 30 CFR 250.300(a), for failure to prevent pollution of offshore waters from the well control incident.

- INC G-110, a violation of 30 CFR 250.107(a), for failure to perform all operations in a manner that ensured complete well control and resulted in a sustained and uncontrolled flow of hydrocarbon fluids to the surface.

On December 1 and 2, 2004, investigation team members conducted additional interviews via telephone with personnel on the platform at the time of the incident. The team also prepared and faxed separate drilling and production questionnaires to drilling company and platform production personnel, respectively. Responses to the faxed questionnaires were received by December 3, 2004.

United States Coast Guard (USCG) Findings

A copy of the USCG report and assessment of the pollution aspect of the event can be found in the Appendix.

Conclusion

Causes

Two direct causes of the loss of well-control incident were identified.

First, cessation of the pumping of completion fluids into the well to maintain sufficient hydrostatic overbalance of the Monterey Formation allowed an underbalanced well condition to develop. Consequently, formation fluids entered the well and migrated uphole.

Second, the tubing hanger lockdown pin was completely removed from the wellhead assembly. Removal of this pin circumvented the blowout preventer system and provided an exit point for the wellbore fluids.

The above causes acted in combination to cause the well control incident.

Possible Contributing Causes

The operator and its contractors did not adhere to the MMS-approved APM and field rules. This allowed conditions to develop that were conducive to well-control problems.

Inadequate and/or inappropriate training with respect to performing the inherently unsafe operation of removing the lockdown pin may have contributed to the incident.

The well was not closely monitored for flow or fluid level during the split-tubing hanger landing operation. A lack of immediate appropriate action by the rig crew may have resulted from this inattentiveness to developing well conditions.

The operator relied upon its contractors' extensive experience to perform the job correctly. However, the operator provided inadequate supervision to the contractors. In addition, the operator and contractors failed to complete a job safety analysis for this operation.

Venoco's Analysis and Corrective Action

Venoco submitted its Taproot incident investigation report to MMS on December 10, 2004. Venoco identified two main root causes that fall under the broader topics of "Work Direction/Planning" and "Management System."

The "Work Direction/Planning" root cause relates to three main areas: 1) "Job Work Packages" (JWP), which are similar to "Job Safety Analysis" (JSA), lacked detail on hazards regarding well-workover procedures; 2) Adequate site supervision was lacking; 3) Deficiencies in decision making with regard to corrective actions and mitigation of known risks were also identified.

Venoco also identified three main areas of concern under their "Management System" root cause: 1) "Standards, Policies, or Administrative Controls" (SPAC) were not used by the wellhead contractor or onsite personnel, leading to the development of a high-risk and

unauthorized procedure; 2) A technical error was made in not following the wellhead manufacturer's recommended practice; 3) There was an apparent lack of enforcement and oversight by the wellhead contractor to ensure that existing written procedures were followed in the field.

Venoco proposes several steps to prevent similar events from occurring in the future. These actions include revising procedures to change the workover fluid pumping position from the fill-up line to the 9 ⅝-inch casing valve access point. New JWP's will be developed and will contain greater detail on significant procedures, contractor involvement, risks, Venoco engineering review, increased site supervision, and communications. The drilling contractor will modify standard operating procedures to ensure adherence to established well control procedures. Personnel changes have been made and participation by the wellhead manufacturer's technical staff is planned during future operations.

Recommendations

MMS Actions

Incidents of Noncompliance (INC's) and Potential INC's (PINC's)

PINC's are regulatory items derived from Federal regulations and are listed on inspection forms which MMS inspectors utilize in performing their duties on offshore platforms. INC's are issued to provide written documentation of violations found during inspections by MMS inspectors.

Within 24 hours following the event, the MMS accident investigation team issued to the operator two INC's for failing to maintain well control and for pollution of offshore waters. A copy of the INC form identifying the INC's issued is included in the Appendix. As a result of the preliminary investigation, another potential INC relating to; (i) Venoco's failure to pump sufficient completion fluid into the well, and (ii) removal of the lockdown pin which circumvented the proper functioning of the well control and blowout prevention system during workover and/or completion operations in accordance with MMS approved Plans and Applications, was identified. Although the two INC's issued broadly address the non-compliances related to the subject incident, an INC specifically referencing 30 CFR 250.514(a) and .614(a) and 30 CFR 250.517(d) and .617(d), regarding well completion and/or workover operations would have been more suitable. The current approved PINC's do not present this option to our inspectors. This investigative team is, therefore, recommending that PINC's be added to the currently approved MMS PINC list that specifically cover the above mentioned regulations.

Safety Alert

A Safety Alert is being drafted and recommended for issuance. The Safety Alert will identify the importance of avoiding the circumvention of the well control system. The Safety Alert will also recommend that:

1. Lessees and operators develop specific procedures or revise existing procedures for landing dual-string casing hangers so that circumvention of the well control system is eliminated.

2. Well control training and safety meetings cover potential consequences of well-control system circumvention.

3. Operators review and/or provide detailed work procedures to be used by company and contract employees.

4. Rig crews and third-party personnel be instructed to conform to approved Applications for Permit to Modify (form MMS-124) and Field Rules.

5. Job Safety Analyses be conducted for all tasks involving potential hazards.

MMS Regulations

The MMS should review current regulations to determine if existing wording is specific enough to prevent/discourage operators from circumventing the well-control and blowout-prevention systems. Workover and completion regulations currently specify that well-control equipment shall be designed, used, maintained, and tested in a manner necessary to assure well control in foreseeable conditions and circumstances as in 30 CFR 250.514, .515, .614, and .615. Also, 30 CFR 250.517 and .617 specify that a wellhead (and tree) shall be designed, installed, used, maintained, and tested so as to achieve and maintain pressure control.

A definition of well-control equipment should be added to the regulations that specifies inclusion of all pressure containment devices including casing, risers (below the BOP stack) and wellhead.

MMS should also consider adding specific requirements for casing valves and associated lines coming off of the wellhead during rig operations which are often used as fill-up lines to pump fluid down the backside of the well. Consideration should be given to requiring conformance with API RP 14C or treating the lines as choke/kill lines with dual valves. Test pressures and time frames for tests should be specified as necessary. Explicit pressure test requirements are also lacking for production/ "Christmas" trees whose test pressures and time frames are not identified in the regulations. Risers and some wellhead components are tested in conjunction with BOP tests.

Other MMS Actions

MMS should investigate ways to minimize or eliminate operator failures and performance inconsistencies due to communication problems between contractors and operator personnel with responsibility over rig operating procedures. One way that this could be accomplished is through a Safety and Environmental Management Plan (SEMP) process. Detailed aspects of contractors' duties and limitations while performing as operator representatives could be discussed at the Annual Performance Review (APR) meeting held with each operator by MMS. Also, distinct aspects of contractor oversight could be added to the Focused Facility Review (FFR) matrix.

APR's involve face-to-face meetings with operators on varying agenda items which currently may include:

- -operator safety and compliance history
- -events, accidents, and civil penalty referrals/assessments
- -level, type, and management of operations
- -organizational information or changes that may have affected compliance or performance during the preceding year
- -a company's success in incorporating the prior year's goals
- -establishment of new goals for the upcoming year
- -special topics/situations unique to the operator
- -OCS-wide issues

FFR's are an enhanced inspection program based on a systemic approach with emphasis on SEMP. They are designed to complement MMS's routine facilities inspection program and, on

000464
CALENDAR PAGE
000811
MINUTE PAGE

average, are conducted on each facility once during 5 year cycles. The frequency may very depending upon platform operations and condition, as well as operator performance.

FFR items of discussion could be expanded to include:

1) General contractor oversight with regard to following approved plans;
2) Methods of monitoring contractor activity;
3) Limitations on contractors' development of unique procedures and methods;
4) Expectations for contractor reporting of all problems and planned repair methods to operator personnel prior to actual repairs.

Venoco Actions

Venoco's planned corrective actions as outlined in the "Conclusions" section of this report will adequately resolve the immediate managerial and procedural problems which directly contributed to the well control incident.

Venoco does not specifically stress discontinuing the practice of pulling the lockdown pin in the corrective action items discussed in its December 9, 2004, incident investigation report. However, the revised dual-string hanger landing procedures submitted with an ensuing Application for Permit to Modify (APM) indicated that the lockdown pin would not be pulled. The operator should discuss its revised dual-string procedures with each crew on future workover/completion operations involving dual string completions.

Well-control training and safety meeting topics should be updated to include items such as:

1) Potential consequences of circumventing the well-control system without adequate downhole isolation and securing of appropriate variances from MMS;
2) Unique operating challenges presented by the characteristic behavior of the Monterey Formation;
3) Increased awareness and attentiveness to operations which could significantly impact well behavior such as precise monitoring of well completion fluid pumping.

MMS *Securing Ocean Energy & Economic Value for America*

The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

The Minerals Management Service Mission

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The MMS **Minerals Revenue Management** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.

U.S. Department of the Interior
Minerals Management Service (MMS)

Submit ORIGINAL plus THREE copies, with ONE copy marked "Public Information"

OMB Control Number 1010-0045
OMB Approval Expires 10/31/2005

APPLICATION FOR PERMIT TO MODIFY (APM)

(Replaces Sundry Notices and Reports on Well)

1. TYPE OF SUBMITTAL ☒ REQUEST APPROVAL ☐ SUBSEQUENT REPORT ☐ CORRECTION	2. MMS OPERATOR NO. 02309	3. OPERATOR NAME and ADDRESS *(Submitting Office)* Venoco, Inc. 5464 Carpinteria Ave., Suite J Carpinteria, CA 93013-1423	
4. WELL NAME E-15	5. SIDETRACK NO. 01	6. BYPASS NO. 00	
7. API WELL NO. *(12 digits)* 043112066401	8. START DATE *(Proposed)* Oct. 29, 2004	9. PRODUCING INTERVAL CODE SS-D02/LS-D01	10. WELL STATUS SS-09/LS-12
11. WATER DEPTH *(Surveyed)* 739'	12. ELEVATION AT KB *(Surveyed)* 113'		

WELL AT TOTAL DEPTH	WELL AT SURFACE
13. LEASE NO. P-0209	16. LEASE NO. P-0205
14. AREA NAME 6B	17. AREA NAME 6B
15. BLOCK NO. 4761	18. BLOCK NO. 4661

RECEIVED OCT 28 2004 MINERALS MANAGEMENT SERVICE AMARILLO DISTRICT

19. PROPOSED OR COMPLETED WORK *(Describe in Section 22)*

- ☐ INITIAL COMPLETION
- ☐ MULTI-COMPLETION
- ☐ RECOMPLETION
- ☒ MODIFY PERFORATIONS
- ☐ CHANGE ZONE
- ☐ PERMANENT PLUGGING
- ☐ TEMPORARY ABANDONMENT
- ☐ PLUG BACK TO SIDETRACK / BYPASS
- ☐ OTHER _____
- ☐ ACIDIZE WITH COIL TUBING
- ☐ ARTIFICIAL LIFT (INITIAL)
- ☐ WORKOVER
- ☒ CHANGE IN APPROVED PROCEDURE
- ☐ FINAL LOCATION PLAT ATTACHED

20. RIG NAME OR PRIMARY UNIT *(e.g., Wireline Unit, Coil Tubing unit, etc.)* Kenai Drilling Rig No. 2

21. RIG TYPE PF

22. DESCRIBE PROPOSED OR COMPLETED OPERATIONS *(Attach Prognosis or Summary of Completed Work, As Appropriate)*

Public Information Copy

FAXED 10/28/04 SJC

23. CONTACT NAME John Hood	24. CONTACT TELEPHONE NO. (805) 745-2164	25. CONTACT E-MAIL ADDRESS jhood@venocoinc.com
26. AUTHORIZING OFFICIAL *(Type or Print Name)* Roger Hamson	27. TITLE V.P. Southern Assets	
28. AUTHORIZING SIGNATURE John for Roger Hamson	29. DATE October 28, 2004	

THIS SPACE FOR MMS USE ONLY

APPROVED BY	TITLE	DATE
Shannon J. Shaw	for: District Manager	10/28/04

PAPERWORK REDUCTION ACT OF 1995 (PRA) STATEMENT: The PRA (44 U.S.C. 3501 et seq.) requires us to inform you that we collect this information to obtain knowledge of equipment and procedures to be used in drilling, well-completion, workover, and production operations. MMS uses the information to evaluate and approve or disapprove the adequacy of the equipment and/or procedures to safely perform the proposed operation. Responses are mandatory (43 U.S.C. 1334). Proprietary data are covered under 30 CFR 250.196. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB Control Number. Public reporting burden for this form is estimated to average 1 ½ hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to the Information Collection Clearance Officer, Mail Stop 4230, Minerals Management Service, 1849 C Street, N.W., Washington, DC 20240.

U.S. Department of Homeland Security
United States Coast Guard

Marine Safety Office/Group
Los Angeles – Long Beach
Supervisor
Marine Safety Detachment
Santa Barbara

111 Harbor Way
Santa Barbara, CA 93109-2397
Staff Symbol: Port Operations
Phone: (805) 962-7430
Fax: (805) 962-7968

16460
December 6, 2004

Mr. Joe Hollis
5464 Carpinteria Ste J
Carpinteria, CA 93013

Subject: WARNING IN LIEU OF CIVIL PENALTY

Dear Mr. Hollis:

Coast Guard personnel investigated an oil spill on November 18, 2004, and discovered the following violation:

Violation Cite: 33 USC 1321(b)(3)
On 18 November 2004, there was a discharge of approximately 3 gallons of crude oil from Platform Gail. This spill created a sheen in the Pacific Ocean, a navigable waterway of the United States.

It was determined that justice will best be served by issuing you a warning rather than pursuing a monetary civil penalty for your conduct as set forth above. You are advised that this warning will become a matter of Coast Guard record and will be considered for any future enforcement actions against you. If you feel this warning is not warranted, you may decline it by signing and dating under the statement below and returning this letter to the address above within 30 days of the date of this letter. However, your refusal will result in civil penalty proceedings being initiated against you in accordance with 33 CFR 1.07. You may contact me at the number above with any questions.

Sincerely,

J. W. RUSSELL
Lieutenant, U.S. Coast Guard
Supervisor, MSD Santa Barbara
By direction

I hereby decline the above-mentioned warning.

Responsible Parties Name

Date

U.S. DEPARTMENT OF THE INTERIOR
MINERALS MANAGEMENT SERVICE

MMS

Page 1 of 1

Date: 11/19/04

Time: (24 HR Clock) 1400

MMS Rep: (Last Name-Print) Shaw

NOTIFICATION OF INCIDENTS OF NONCOMPLIANCE

You are hereby ordered to correct any identified Incident of Noncompliance (INC) listed below. You have the right to appeal any INC notification in accordance with Title 30 CFR, part 290. Your appeal must be filed in the office of the official issuing this notice. However, the filing of an appeal with the Director shall not suspend the requirement to comply with this notice.

MMS Office Address:	Lease No.	Area and Block:	Facility/Rig & Well No.
Camarillo District 770 Paseo Camarillo Camarillo, CA 93010	P-0205	6B/4661	Platform Gail Well # E-15

Lease Operator: (Print)	Drill, Prod, P/L Contractor: (Print)	Turnkey Company: (Print)
Venoco	Kenai Drilling Ltd	N/A

Enforcement Action: W - Warning C - Component Shut-in S - Facility Shut-in

PINC No	Enf Act.	Authority 30 CFR 250.	INC Description and any Special Orders (shut-in of operations, facility, wells, etc.)	Date Corrected
E-100	W	300(a)	Operator was unable to prevent pollution of offshore waters that resulted from a well control incident from Well # E-15 on 11/18/04.	11/18/04
G-110	S	107(a)	Operator did not perform all operations in a manner that ensured complete well control resulting in a sustained and uncontrolled flow of hydrocarbon fluids to the surface.	11/18/04

Signature of MMS Representative: Shannon J. Shaw

Signature of Operator Representative: (Please Print Last Name and Sign) MARTINEZ Tony Martinez Date: 11/19/04

The date each Incident of Noncompliance was corrected shall be inserted in the appropriate column and the green copy of this form signed and dated below and returned by the operator to the MMS office identified above no later than 14 DAYS from the date of issuance. If the green copy cannot be returned within the allotted time, a waiver must be obtained from the appropriate MMS office. This process should ensure that onshore operator management is aware and acknowledges that INC's were issued on this facility, on this date, but in no way delays any enforcement action taken.

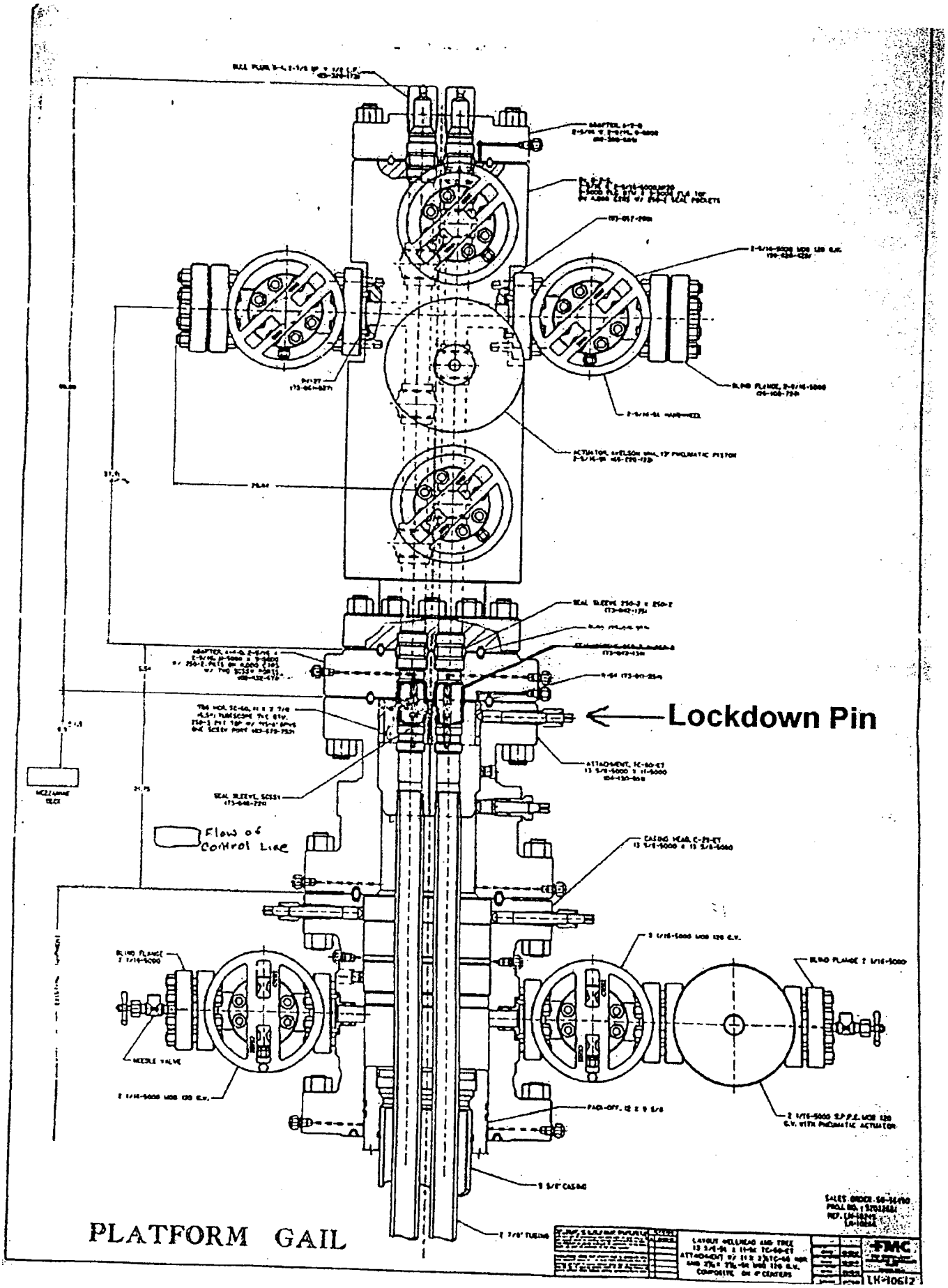
Unless specifically ordered otherwise, the operator representative must correct and inspect all component and facility shut-in INC's identified and notify the issuing MMS office before returning to operations.

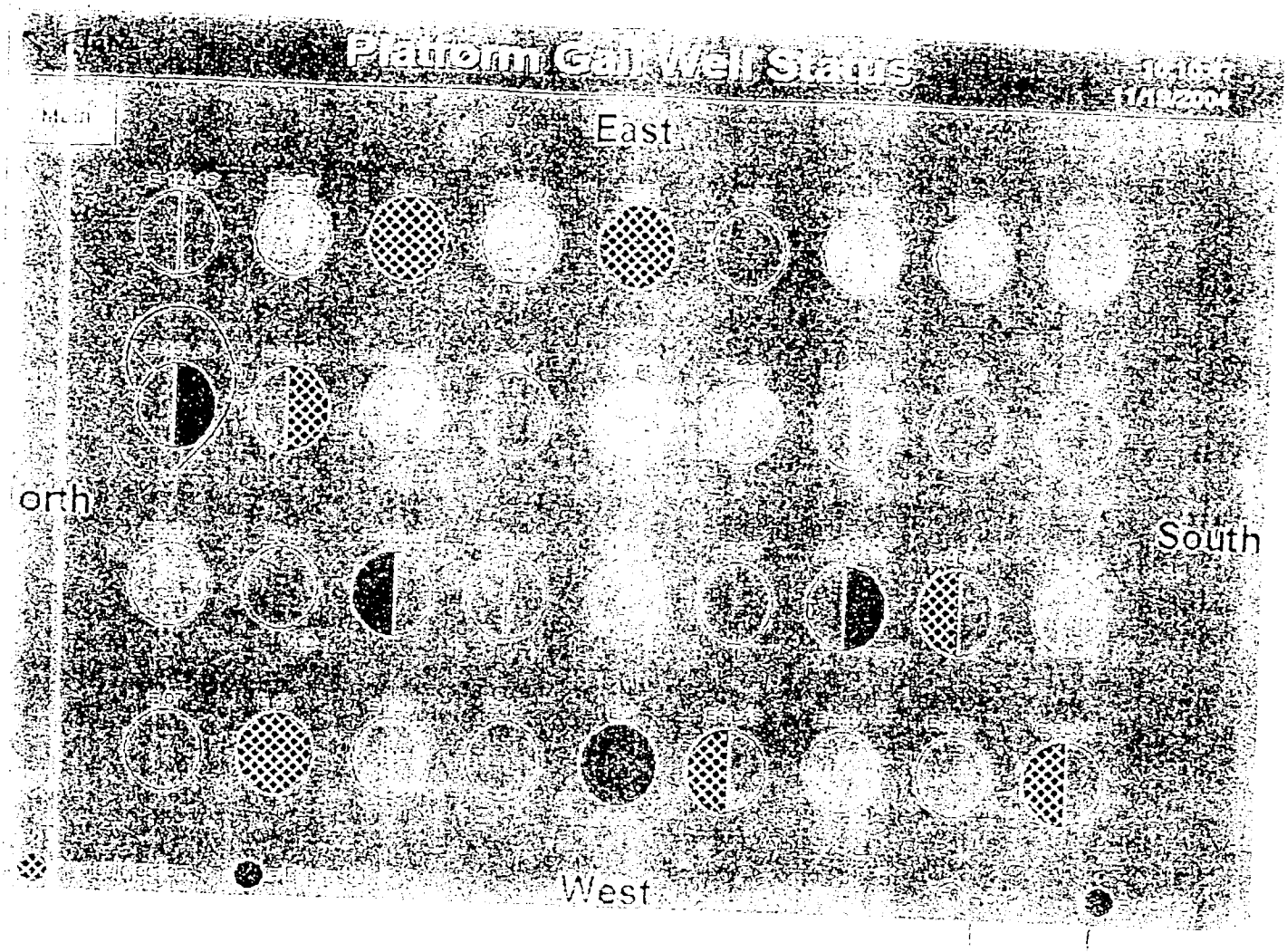
I, the undersigned, certify each Incident of Noncompliance listed above has been corrected on the corresponding date.

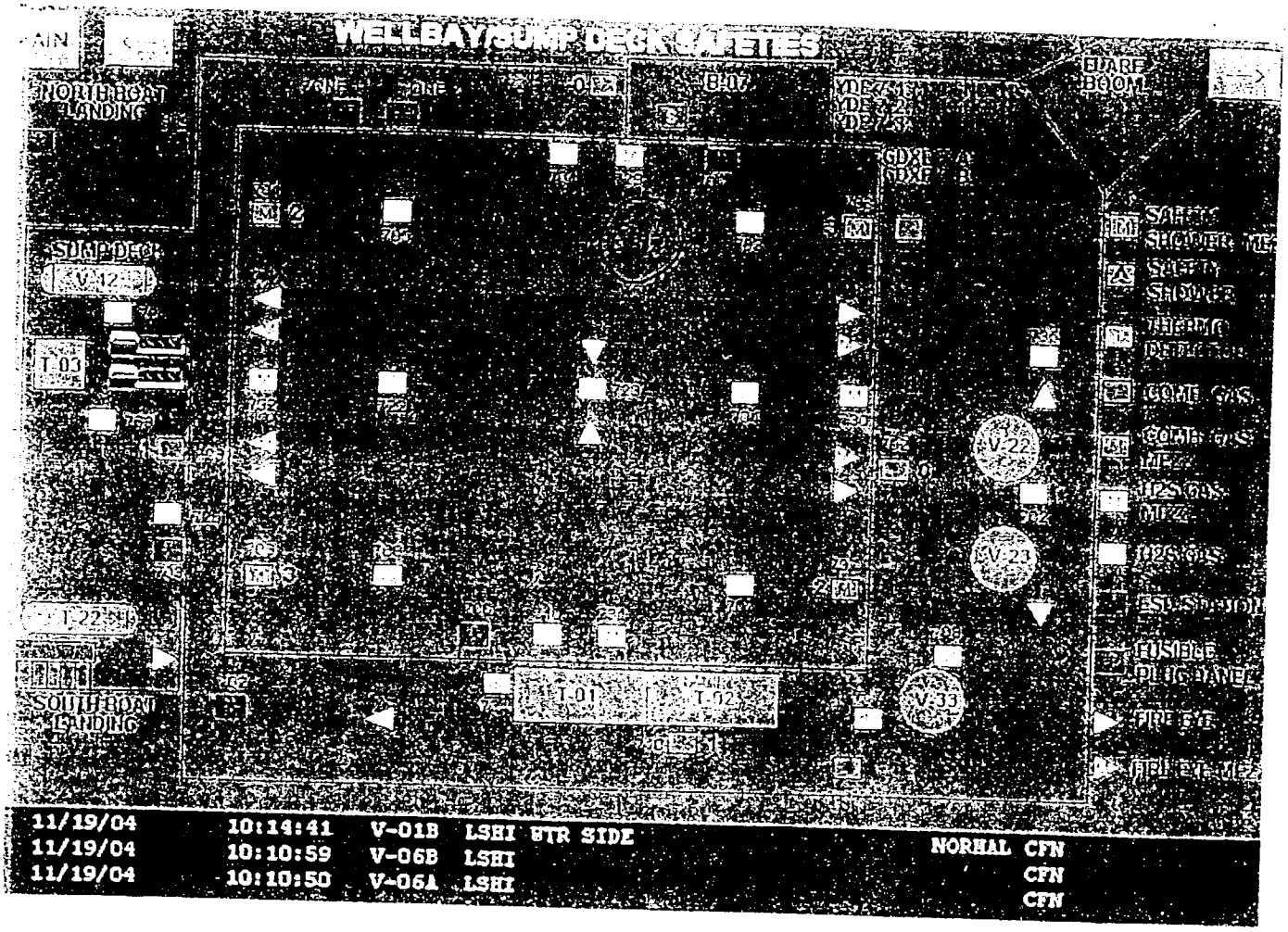
Manager/Supervisor: (Please Print Last Name) (Sign) Date:

Form MMS-1832 - January 1998
(Supersedes Form MMS-1832, March 1996). ORIGINAL COPY

Your comments are important. The Small Business and Agriculture Regulatory Enforcement Ombudsman and 10 Regional Fairness Boards were established to receive comments from small businesses about federal agency enforcement actions. The Ombudsman will annually evaluate the enforcement activities and rate each agency's

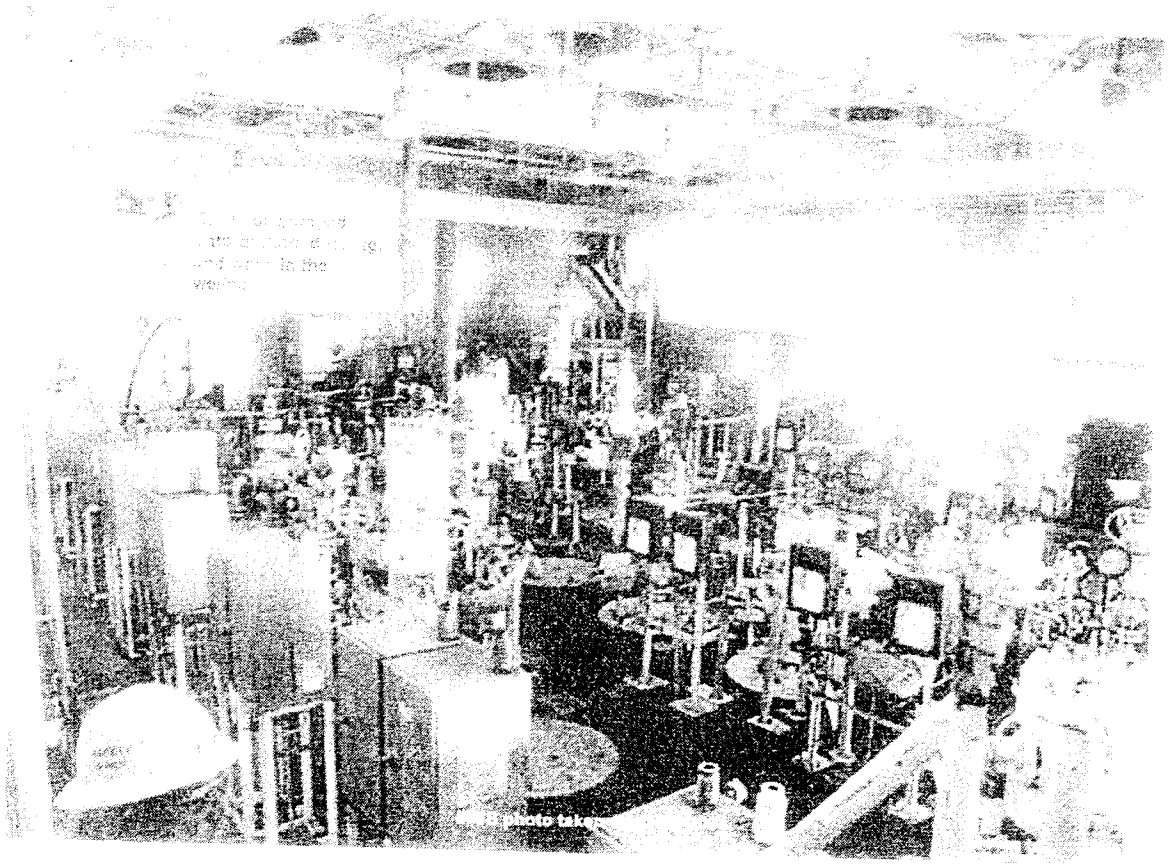

Lockdown Pin
Flow of Control Line
PLATFORM GAIL
FMC


Platform Gail Well Status
Main
East
orth
South
West


WELLBAY/SUMP DECK SAFETIES
NORTH BOAT LANDING
SUMP DECK
V-12
T-03
T-22
SOUTH BOAT LANDING
T-01
T-02
V-22
V-21
V-33
FLARE BOOM
SAFETY SHUTDOWN
THERMO DETECTOR
COMB GAS
ESD SHUTDOWN
FUSIBLE PLUG PANEL
FIRE EYE
11/19/04 10:14:41 V-01B LSHI HTR SIDE NORMAL CFN
11/19/04 10:10:59 V-06B LSHI CFN
11/19/04 10:10:50 V-06A LSHI CFN

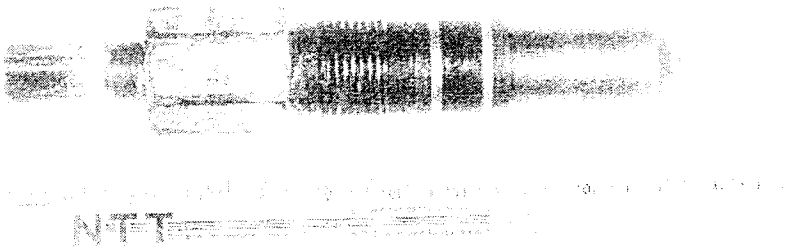
Platform Gail, showing location of wellbay.

MMS Photo taken on 11-19-2004



MMS offshore platform showing crude oil sprayed onto grating, decking, and walls in the wellbay.

MMS photo taken on 11-19-2004



Lockdown Pin

Lockdown pin from offshore oil platform next to 12" ruler to show size.

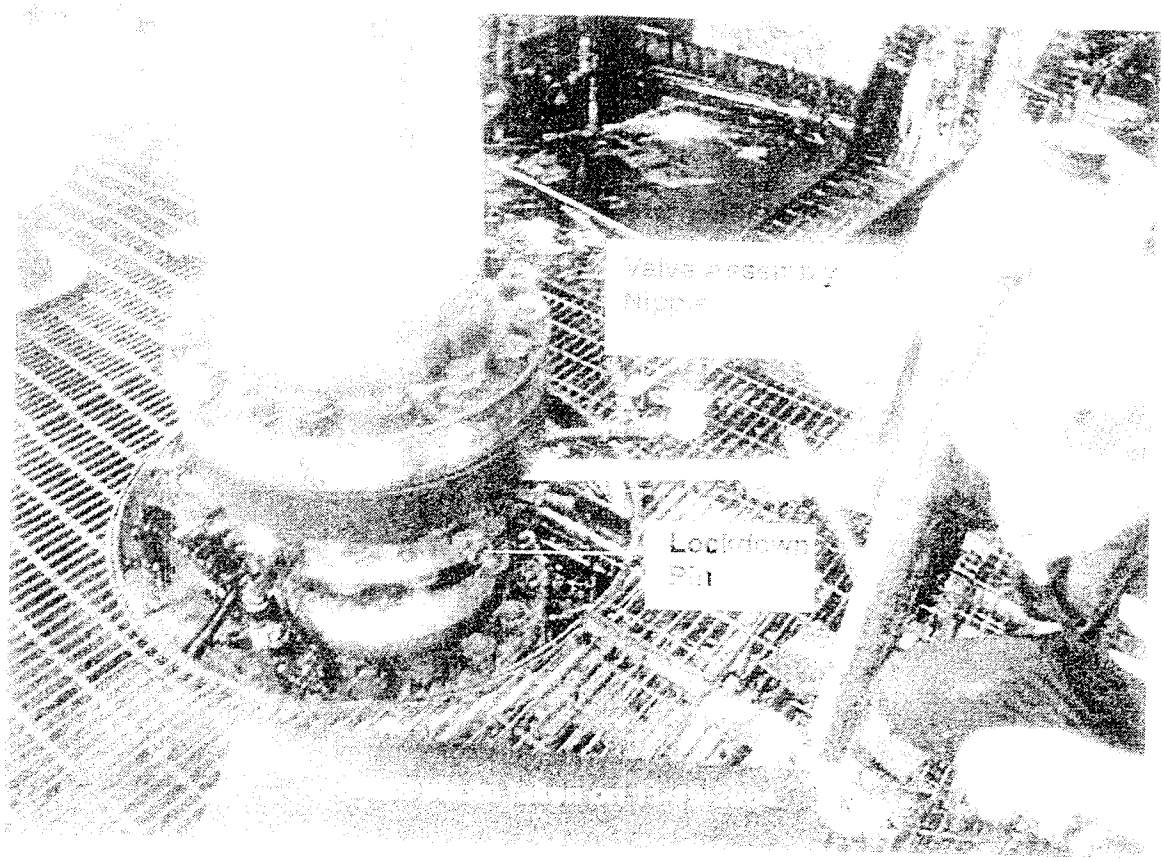


Photo showing valve assembly nipple and lockdown pin on offshore oil platform.

MMS photo taken on 11-19-2004

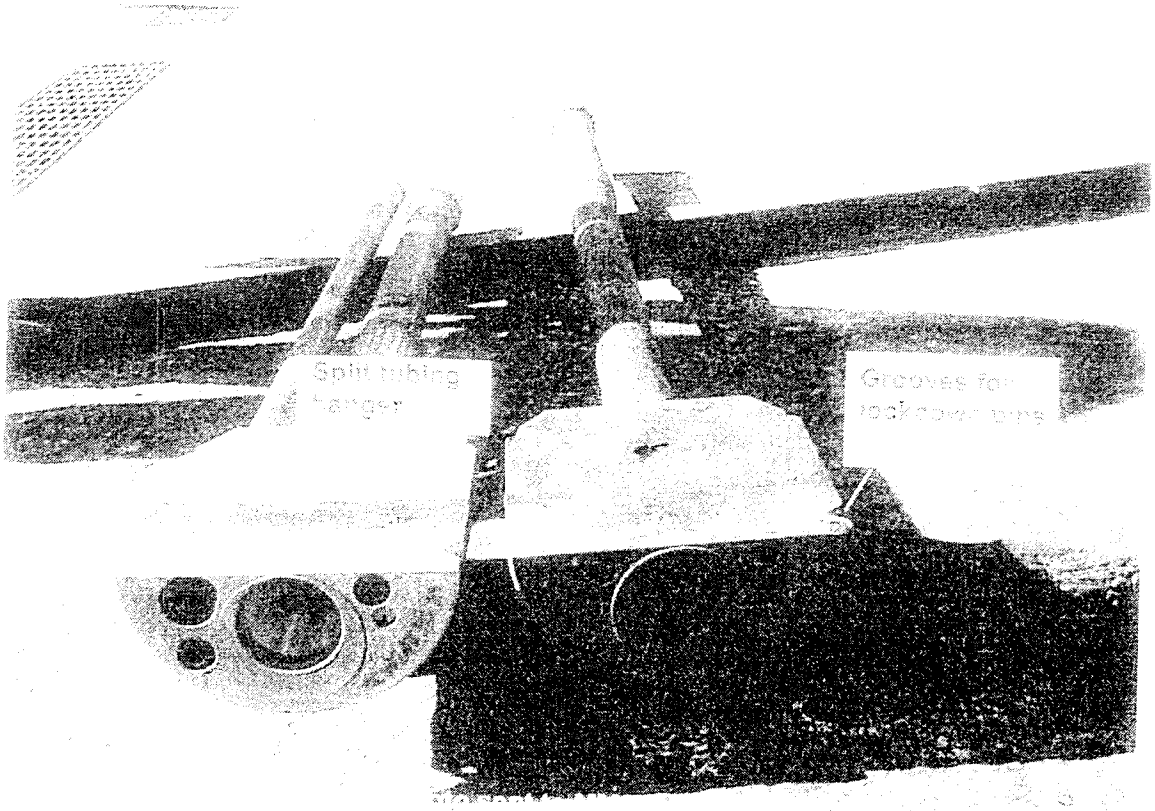


Photo showing split tubing hanger and grooves for lockdown pins on offshore oil platform.

Venoco photo sent to MMS on 11-24-2004