

Investigation of May 1984 Explosion And Fire
Lease OCS-G 3280, West Cameron Block 405
Gulf Of **Mexico**,
Off The Louisiana Coast

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Prepared by

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JULY 1985

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I. INVESTIGATION AND REPORT

A. Authority

A serious explosion and fire occurred on May 13, 1984, on Getty Oil Company's (Getty) Platform A, West Cameron Block 405, Lease OCS-G 3280, in the Gulf of Mexico, offshore the State of Louisiana. Pursuant to Section 208, Subsection 22 (d), (e), and (f), of the Outer Continental Shelf Lands Act Amendments of 1978, and Department of the Interior Regulations 30 CFR Part 250, the Minerals Management Service (MMS) is required to investigate and prepare a public report of this accident. By memorandum dated May 15, 1984, the following MMS personnel were named to the investigative panel:

E. G. Hubble, Lafayette, Louisiana
D. A. Oliver, Lake Charles, Louisiana
R. D. Whitaker, Metairie, Louisiana
R. R. Konecni, Metairie, Louisiana
C. J. Schoennagel, Metairie, Louisiana
P. McDonald, Reston, Virginia

B. Procedures

An informal meeting was convened at the MMS office in Metairie, Louisiana, on August 23, 1984. The investigative panel was present, reviewed the information obtained about the incident, and discussed methods of completing the investigation.

An informal hearing was convened by panel chairman Mr. E. G. Hubble with Getty employee Mr. W. M. Taylor, Platform A facility operator, on September 20, 1984, at 11:00 a.m. at Mr. Taylor's residence in Tioga, Louisiana. Mr. Taylor's legal counsel was present at this hearing.

II. INTRODUCTION

A. Background

Lease OCS-G 3280, West Cameron Block 405, Gulf of Mexico, approximately 5,000 acres, is located off the Western Louisiana coast (for lease location, see attachment 1). The lease was issued effective September 1, 1975, for a cash bonus of \$7,513,000 with a 1/6 fixed royalty rate. The original lessees were as follows:

Skelly Oil Company	-	50 percent
Texasgulf, Inc.	-	25 percent
Northern Natural Gas Company	-	25 percent

Skelly Oil was designated as operator of the lease, effective with its issuance. Effective January 31, 1977, Skelly Oil was merged with and into Getty Oil Company, which was merged with and into Texaco Producing, Inc. Effective December 31, 1984, the lessees were as follows:

Texaco Producing, Inc.	-	50 percent
Elf Aquitaine, Inc.	-	25 Percent
InterNorth, Inc.	-	25 percent

Three exploratory wells were drilled on this lease prior to Getty submitting a request, by letter dated October 10, 1977, to install Platform A in West Cameron Block 405.

On December 1, 1977, the Oil and Gas Supervisor for Field Operations granted approval for the design, plan of installation, and surface location for the platform (for platform location, see attachment 2).

Development drilling operations commenced from Platform A on April 29, 1978. One exploratory well was tied back and five development wells were drilled and completed from this structure by May 7, 1979 (for locations of exploratory wells 1 through 3 and platform wells A-1 through A-6, see attachment 3). On August 27, 1979, gas wells drilled and completed from Platform A were placed on continuous production.

The last complete inspection of Platform A by an MMS Petroleum Engineering Technician prior to the explosion and fire was conducted on December 4, 1983. The results of this inspection indicated that there were no violations of MMS regulatory requirements.

B. Description of Incident

On May 13, 1984, on West Cameron Block 405, Platform A, Lease OCS-G 3280, a high sand level in the test separator caused the float on the dump valve to hang up in the open position. As a result, dry gas was blown through the liquid hydrocarbon outlet line and subsequently through the liquid meter that measured the liquids from both the test and production separators.

At approximately 9:30 p.m. CDT, personnel on the platform decided to clean the sand out of the test separator. All production was then switched to the production separator to allow the produced sand to be removed from the test separator.

The test separator and sump tank were filled with water to float any liquid hydrocarbons out. A water hose was hooked up from the fire pump to a valve on the test separator. The water and sand were then flushed from the test separator through a 2-inch, normally closed drain line to the sump tank. The drain valve on the bottom of the sump tank was opened, and the sand and fluid were dumped directly overboard (for schematic of sump tank, see attachment 4).

While the test separator was being washed out, the alarm on the gas detection system sounded. The only two Getty personnel aboard the platform--Mr. Taylor, the facility operator, and Mr. Donald R. Stringfellow, facility roustabout--went upstairs to the living quarters to investigate the alarm. Upon entering the living quarters, they detected a strong gas odor. The door through which they entered was propped open, and both men started for the back door when an explosion occurred.

At this time, only Mr. Taylor could be accounted for; he exited through the door which he had entered, and made his way to the other side of the platform, where he actuated the emergency shutdown system. Subsequent to the initial explosion, but prior to abandonment of the platform, Mr. Taylor made several attempts to locate Mr. Stringfellow. In the course of these efforts, Mr. Taylor heard two additional explosions (for photograph of damage, see attachment 5).

In attempting to abandon the platform, Mr. Taylor found the escape capsule covered with debris. Fearing cable damage, Mr. Taylor lowered the capsule into the water before boarding it. Mr. Taylor then went down to the 12-foot level, jumped into the water, and crawled into the capsule. However, he could not release it from the launch cable because his hands were severely burnt. He then opened the hatch door and fired several flares. He was rescued shortly thereafter by the motor vessel Ocean King.

Upon boarding the platform on May 14, 1984, Getty personnel found Mr. Stringfellow's body in the burnt remains of the living quarters. Both the living quarters and the generator building were destroyed by the explosions and fire.

III. FINDINGS

A. Preliminary Activities

During the course of normal producing activities at Platform A, West Cameron Block 405, problems developed with the test separator. The build-up of produced sand in this vessel caused dry gas to discharge through the liquid hydrocarbon outlet line to the liquid meter. The test separator, which was used continuously, was shut in, and all production was switched to the production separator. The test separator and sump tank were filled with water to purge the vessels of hydrocarbons.

The drain valves on both the test separator and the sump tank were opened, and water was pumped into the test separator. The sand was flushed out of the test separator and into a normally closed drain line that was piped to the sump tank. The drain valve on the sump was opened, allowing the water and sand flushed from the test separator to go directly overboard.

B. Accumulation of Explosive Gases

During the course of flushing the test separator, gaseous hydrocarbons that were entrained in the produced sand were separated from the sand particles. These gases accumulated in the sump tank, along with other gaseous hydrocarbons that may have been both entrained in the produced water from the regular production stream and vented from the glycol reboiler.

Since the dump valve to the sump tank was open, the liquid level in the sump tank dropped below the ends of the drain lines piped into this vessel. This allowed any gases flashed from the produced sand and produced water, or vented from the glycol reboiler, to enter not only the vent line that pipes such gases to the flare boom, but also the 6-inch deck drain line.

Normally, if any gases were flashed into the 6-inch deck drain line, they would be prevented from migrating through this drain system by a check valve located in a vertical run of pipe leading to the sump tank (for photograph of valving on top of sump tank, see attachment 5). However, upon investigation after the accident, it was determined that the flapper in this check valve was missing, rendering it inoperative. This allowed the gases to migrate through the deck drain system to openings under both the living quarters and generator building (for photographs of drain openings, see attachment 6). Gases migrating through the drain system accumulated under both of these buildings.

C. Explosion and Fire

An alarm for the gas detection system for the living quarters sounded, alerting personnel that an abnormal situation existed. Upon entering the living quarters to investigate this alarm, personnel detected a gas odor. Shortly after they entered the building, an explosion and fire occurred with additional explosions occurring thereafter. Several theories exist as to the cause of the initial explosion, but none is conclusive.

D. Emergency Shutdown and Evacuation

The platform emergency shutdown system was activated after the explosion and fire occurred. The escape capsule was lowered into the water but was unoccupied.

The survivor, Mr. Taylor, did not abandon the platform via the capsule because of fear that debris blown against it during the explosion had damaged the cable. He boarded the capsule after it was lowered in the water, but could not release it from the launch cable because of severe burns to his hands. He was rescued from the capsule by the motor vessel Ocean King.

E. Fatality and Damage

The explosion and fire resulted in the fatality of Getty employee Mr. Donald R. Stringfellow. His body was recovered in the burnt remains of the living quarters by personnel who reboarded the platform on May 14, 1984. The only other Getty employee aboard the platform at the time of the accident, Mr. William M. Taylor, sustained severe burns.

The living quarters and the generator building were completely destroyed by the explosion and fire. The heliport was blown into the water and has not been recovered (see the Getty Report, attachment 7). The damage was estimated to be \$1,250,000.

IV. CONCLUSIONS

A. Proximate Cause of Incident

The living quarters and generator building were both placed over open drains, and the openings between the buildings and the floor were sealed. The drains from under these buildings were routed to the sump tank. Washing the produced sand out of the test separator to the sump tank without maintaining a liquid level in the sump caused gas fumes to migrate up the drain line to the open drains under the buildings. The gas fumes then migrated up through the floor and walls into the living quarters.

B. Proximate Cause of Explosion and Fire

No evidence was available to determine the actual source of ignition. However, it is believed that the thermostat or air conditioner could be the source of ignition. One theory is that when personnel entered the living quarters to investigate the alarm, hot air from the outside caused the thermostat to trip and the air conditioner to start up. Another is that the gas-enriched air in the living quarters mixed with air from the outside when the living quarters door was propped open, creating an explosive mixture that was ignited by the thermostat.

V. RECOMMENDATIONS

A. OCS Order No. 7 Be Revised

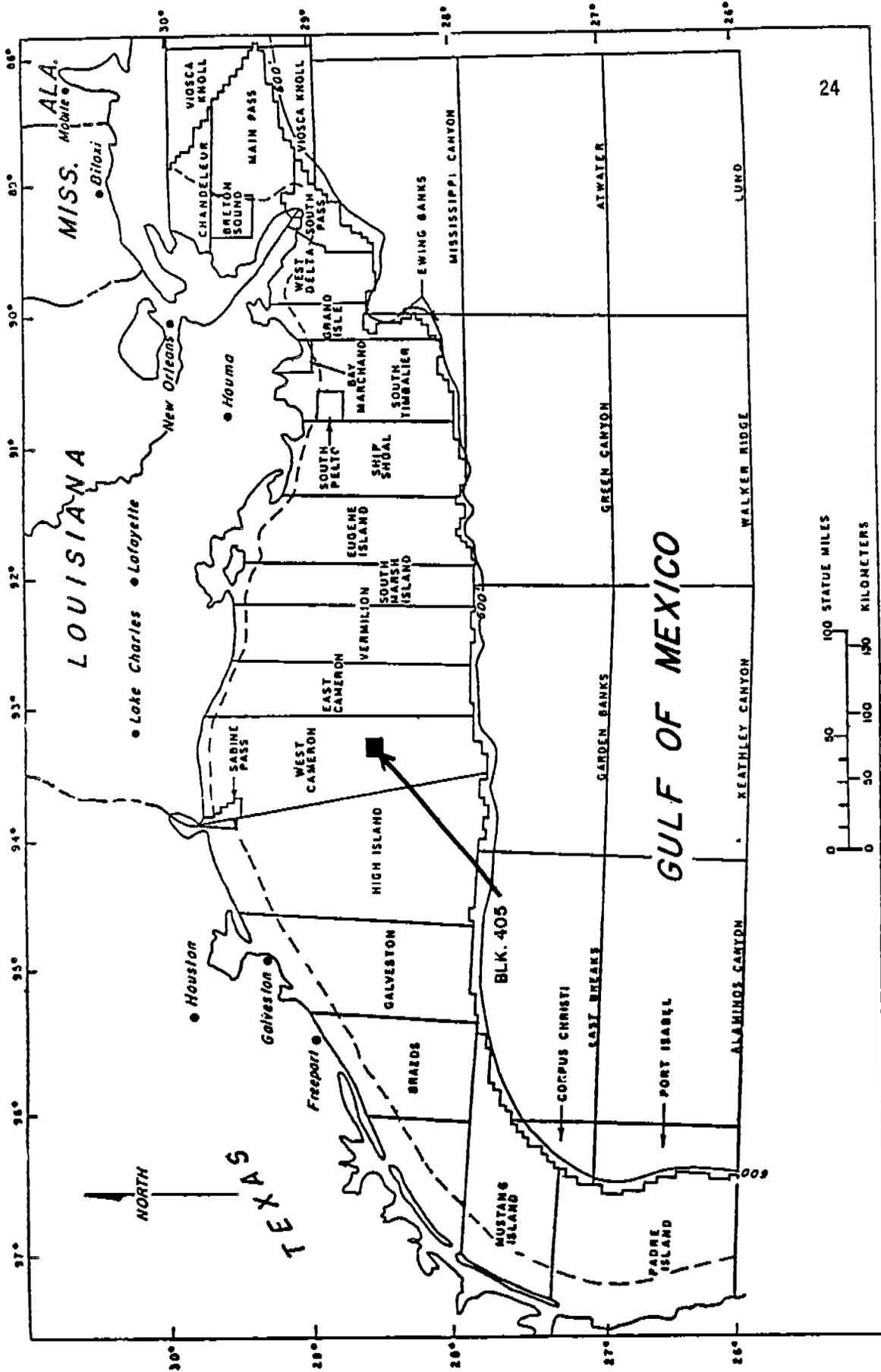
Traps shall be installed on drain lines to prevent vapors from backing up through open drains. If a check valve is installed in the drain line to prevent vapors from backing up through open drains, then the check valve shall be inspected on a regular basis.

B. OCS Order No. 5 Be Revised

The method of removal and disposal of produced sand from vessels or sump tanks shall be approved by the appropriate District Office prior to commencement of production from a platform.

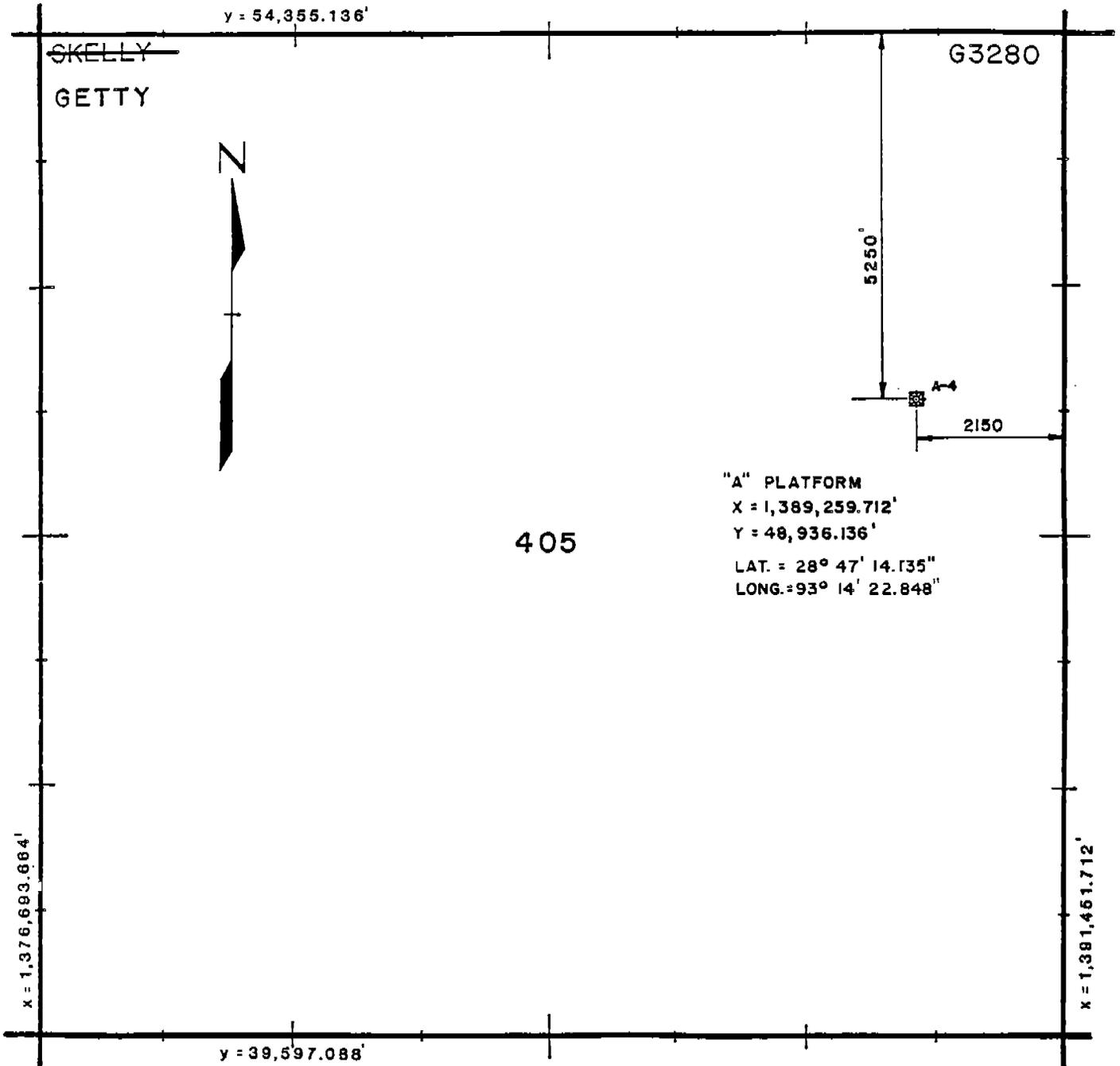
C. Safety Alert Be Issued

1. Production platforms should be analyzed to see if open drains exist under buildings.
2. Production systems where glycol reboilers are vented into the sump system should be reviewed.

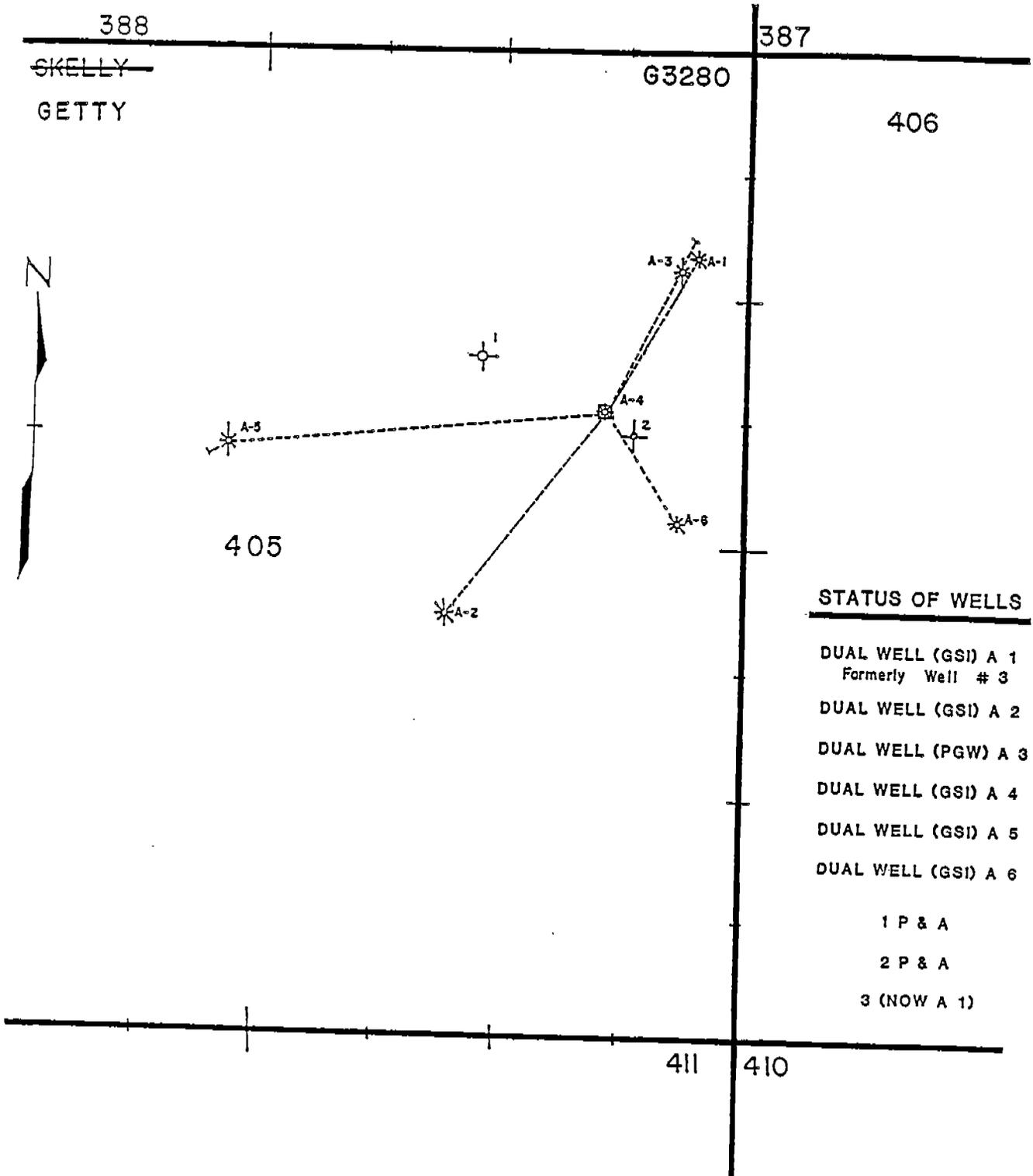


INDEX MAP SHOWING OUTER CONTINENTAL SHELF LEASING AREA OFF TEXAS AND LOUISIANA. DASHED LINES, SHOWN AT 3 MARINE LEAGUES (9 NAUTICAL MILES) FROM THE TEXAS COAST AND 3 NAUTICAL MILES FROM THE LOUISIANA COAST, INDICATE BOUNDARY BETWEEN STATE AND FEDERAL WATERS. SOLID LINE INDICATES 600-FOOT WATER DEPTH.

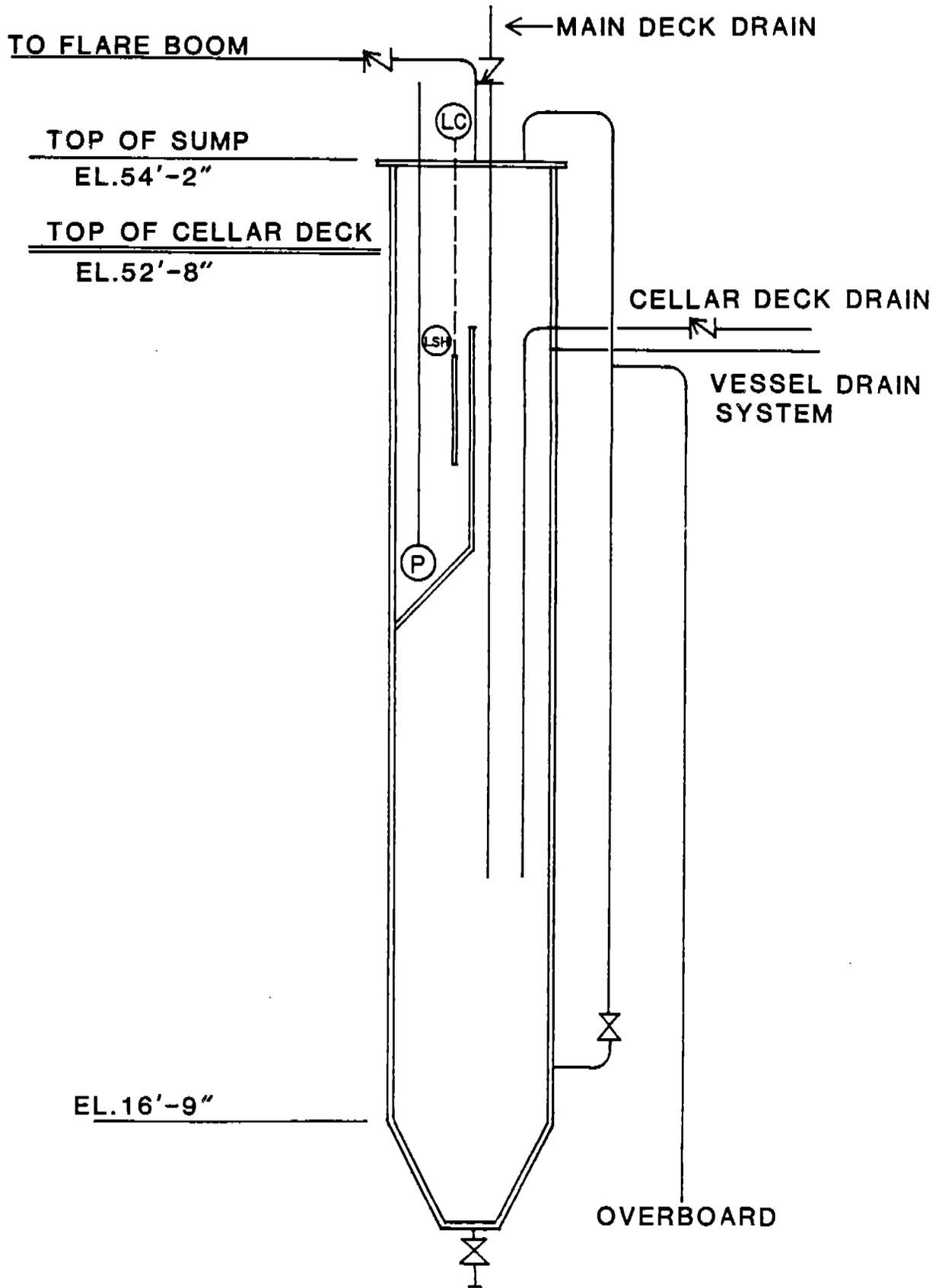
WEST CAMERON BLOCK 405
LOCATION OF PLATFORM A
ON LEASE OCS - G 3280

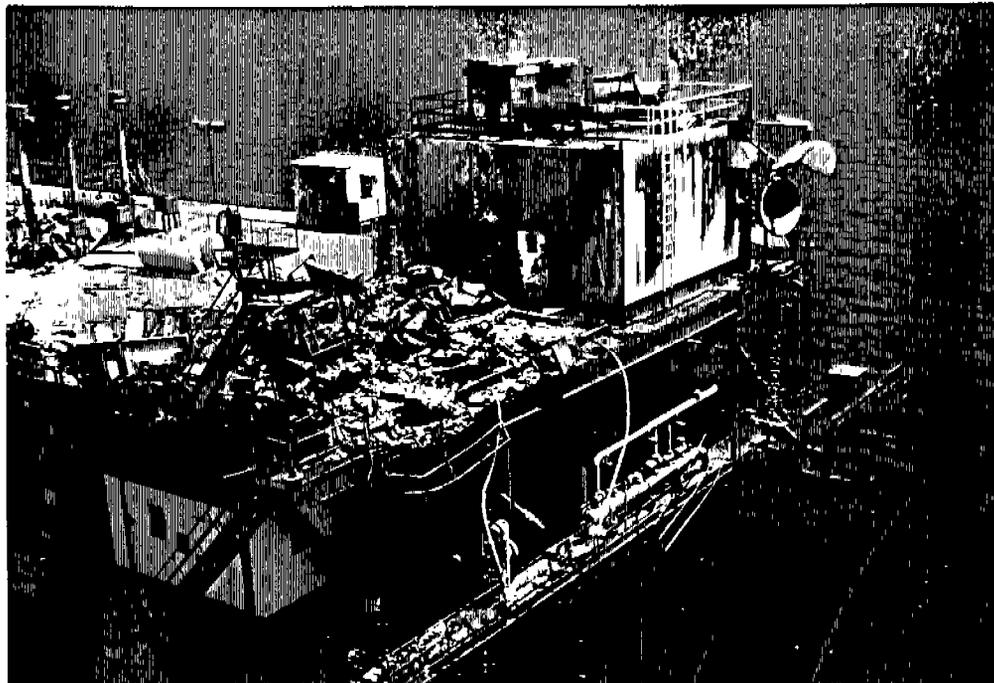


WEST CAMERON BLOCK 405
LOCATION OF PLATFORM A
ON LEASE OCS - G 3280

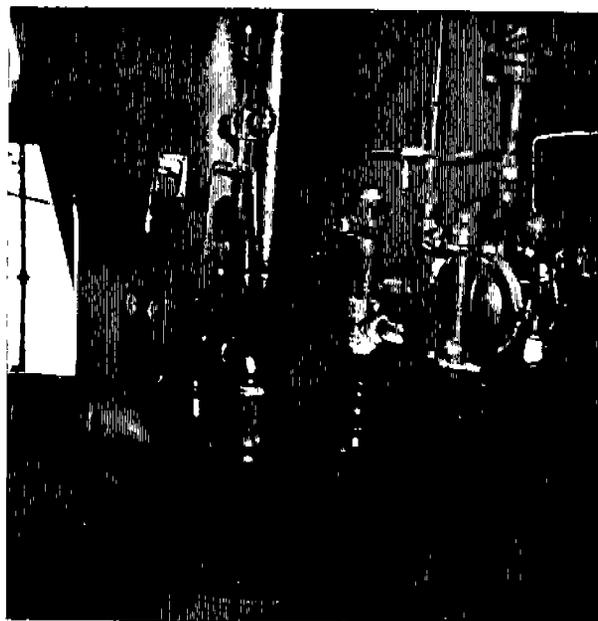


SUMP TANK-W.C.405





DAMAGE INCURRED TO WEST CAMERON BLOCK 405, PLATFORM A



VALVING ON TOP OF SUMP TANK



DRAIN OPENING UNDER LIVING QUARTERS



DRAIN OPENING UNDER GENERATOR BUILDING



Getty Oil Company

Post Office Box 51367, Lafayette, Louisiana 70505 • Telephone: (318) 232-5813

Lafayette Area, Offshore District
Southern Exploration and Production Division

August 16, 1984

CERTIFIED MAIL

File: OCS-G 3280 Lease
West Cameron Block 405
Platform "A"
Gulf of Mexico, Western
Offshore Cameron Parish
Louisiana
AGENCY GENERAL
CONFIDENTIAL

In Re: Explosion and Fire
May 13, 1984
FINAL REPORT
30 CFR 250.45 (a) (2)

United States Department of the Interior
Minerals Management Service DO-4
P. O. Box 3288
Lafayette, LA 70502-3288

Attention: Mr. Elmo Hubble

Gentlemen:

The purpose of this letter is to make a Final Report to the Minerals Management Service (MMS) concerning the explosion and subsequent fire that occurred at Getty Oil Company's (Getty) West Cameron Block 405 OCS-G 3280 Production Platform "A". This report is made pursuant to the provisions of Title 30, Code of Federal Regulations, Part 250.45 (a) (2), Chapter II (July 1, 1982).

Subject platform is owned and operated by Getty and located approximately 67 statute miles south of Cameron, Louisiana. The platform has produced natural gas and associated liquids continuously since August, 1979. There were two persons assigned to the platform at the time of the incident.

On May 13, 1984 at approximately 11:00 p.m. CDT, an explosion and subsequent fire occurred at the platform referenced hereinabove. The U. S. Coast Guard was notified by personnel aboard the M/V

August 16, 1984

Ocean King which was in the area and noticed the fire. Appropriate personnel within the Getty organization were then notified by the Coast Guard. The M/V Ocean King proceeded to the burning platform to attempt to effect a rescue of personnel assigned to the facility. One survivor was picked up from the water, with one person unaccounted for. The survivor was transported to Getty's West Cameron Block 436 Production Platform where a Medi-Vac Helicopter then transported the individual to the John Sealey Burn Center in Galveston, Texas. The survivor was identified as William M. Taylor, a resident of Tioga, Louisiana. Mr. Taylor was the Facility Operator.

A search was initiated by Coast Guard helicopters, and Getty marine vessels and helicopters for the other man. At approximately 7:00 a.m., Getty personnel boarded the platform to survey the damage. During the inspection, the body of the missing person was discovered inside the door in the SW corner of the quarters. The air and sea search was terminated at that time. The Cameron Parish Coroner was transported to the platform to retrieve the body. The body was then transported to Cameron, Louisiana for disposition. The deceased was identified as Donald R. Stringfellow, a resident of Pittsview, Alabama. Mr. Stringfellow was the Facility Roustabout.

Prior to the explosion, both men were on the production deck level washing out the test separator. They heard the gas detection warning alarm. At that time both men, after having shut down the cleaning operation, went upstairs to investigate the cause of the alarm. Both men entered the quarters building at the same time. They smelled gas and propped open the door from which they entered. They were on their way to open another door when the initial explosion occurred. The source of the ignition has not been determined. Following the primary explosion, Mr. Taylor was able to escape the burning structure by exiting through the kitchen door. After having escaped and recovered from the initial shock, Mr. Taylor attempted to locate Mr. Stringfellow, but due to the extreme intensity of the heat, he was unable to approach the building.

Mr. Taylor then made his way to the other side of the platform and actuated the Emergency Shutdown Device (ESD) located on the NE corner next to the down stairway, thus shutting in the platform. A second explosion occurred in the Quarters while he was at the other end of the platform. Mr. Taylor then made his way down to the +12' level and laid down. He apparently went to sleep for an undetermined period of time. Mr. Taylor was awakened by a

third explosion and jumped into the water. He was wearing a life vest. He was in the water for approximately 30 minutes. Mr. Taylor made his way around to the ladder and reboarded the platform. He then returned to the second deck to attempt to activate the capsule. The capsule release mechanism was covered with debris. Mr. Taylor did not attempt entry into the capsule for fear of cable damage from the debris. He therefore lowered the capsule into the water empty. He then went back downstairs to the +12' level and reentered the water, and crawled into the capsule. He attempted to release the capsule from the launch cable but could not. Mr. Taylor opened the hatch door and fired several flares. He was rescued shortly thereafter by the M/V Ocean King.

The explosion and fire completely destroyed the Quarters Building and the Generator Building located adjacent to the Quarters Building. The heliport was blown into the water and never recovered.

Prior to the accident, high sand volumes in both the production and test separators were detected and there was a possibility that they might not continue to operate until morning. Therefore, all wells were switched to the production separator to allow the test separator to be cleaned. The test separator and sump were filled with water to float any residual condensate out. The separators are connected to the sump through a closed drain system. The Living Quarters Building and Generator Building were both positioned over an open drain. These drains were also routed to the sump. It appears that during the washing out of the test separator, gas may have backed up through the drain system under the Quarters Building. Gas may have then migrated up through the flooring and walls thus contaminating the building with natural gas. The gas was then ignited from an undetermined ignition source.

In addition to the safety devices already in place, all drain lines have been plugged or removed from under all buildings on Getty operated production platforms. A separate vent line has been installed to the drain system to supplement the vent already on the sump. "P" traps have been installed to help keep vapors from being emitted through the drains. The glycol reboiler has been vented to atmosphere instead of into the sump. All employees assigned to the production platforms have been directed to stay away from buildings in the event a gas detection alarm is triggered until the source can be identified and eliminated by safe means.

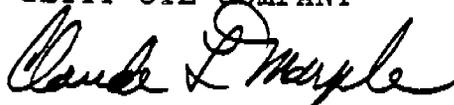
Attached is a schematic of the drain systems and the sump at the present time.

United States Department of the Interior
Page 4
August 16, 1984

Should you have any questions concerning this report, please advise.
Getty sincerely appreciates your patience and consideration in this matter.

Yours truly,

GETTY OIL COMPANY



Claude L. Marple
Area Superintendent

LH, III/ddh

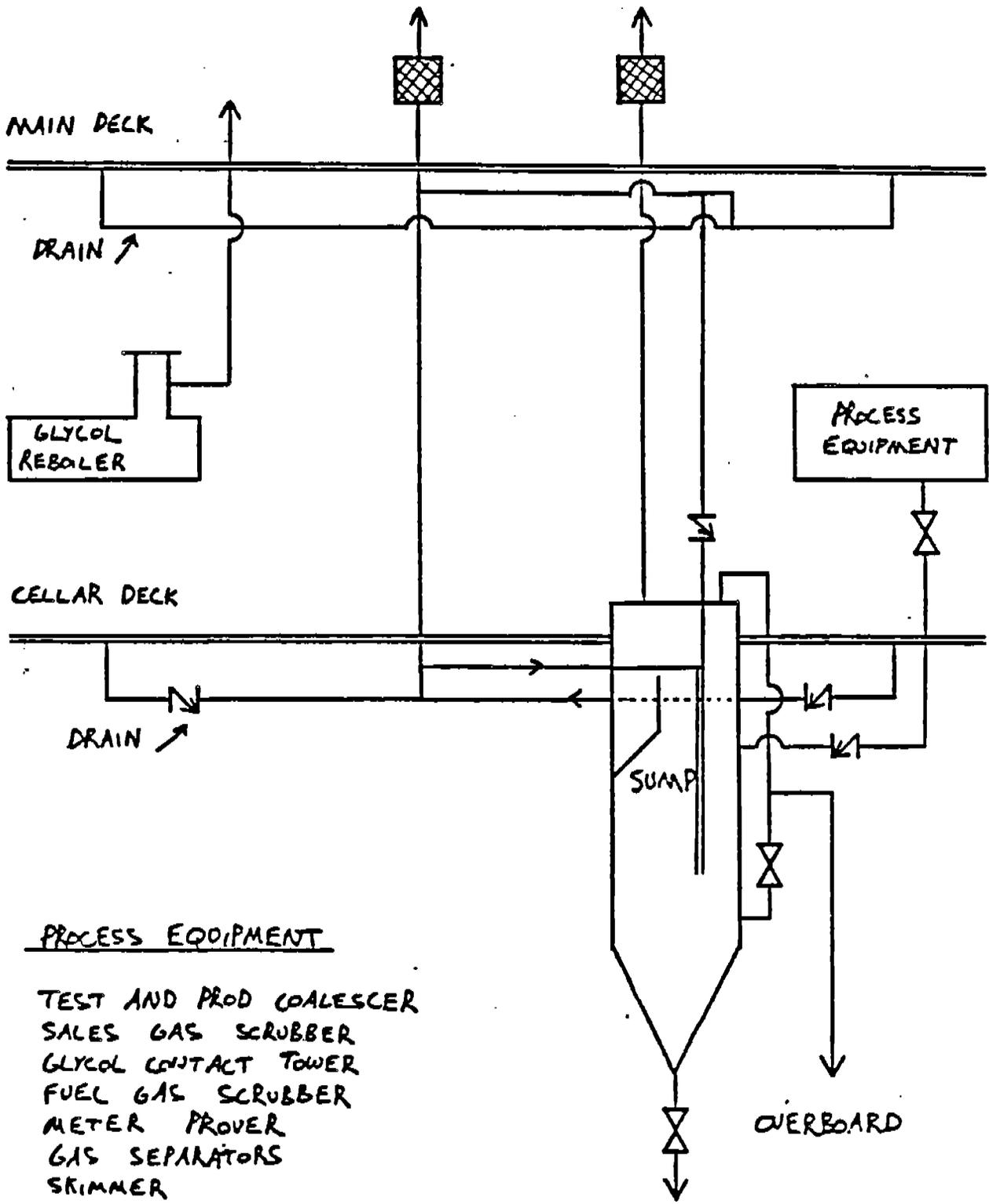
Attachment

cc: Mr. B. M. Breining (w/attachment)

United States Coast Guard (w/attachment)
Marine Safety Office
7875 75th Street and Highway 69
Port Arthur, TX 77650
Attention: Lt. Jack Hardin

WEST CAMERON BLOCK 405 A PLATFORM

SUMP DIAGRAM



PROCESS EQUIPMENT

- TEST AND PROD COALESCER
- SALES GAS SCRUBBER
- GLYCOL CONTACT TOWER
- FUEL GAS SCRUBBER
- METER PROVER
- GAS SEPARATORS
- SKIMMER

GLOSSARY

check valve (n): A valve with a free-swinging clapper that permits flow in one direction only.

closed drain line (n): Closed containment system of piping from a production process component to a sump tank, used primarily to manually drain (discharge) sand and mud accumulations from the component to the sump.

drain system (n): Platform containment system installed to collect and direct escaped liquid hydrocarbons to a safe location such as a sump tank.

drain valve (n): Manually operated valve used to drain water, oil, or sand from a production process component such as a separator.

dry gas (n): Gas that has been processed through production separators, scrubbers, and glycol contactor to remove all free liquids.

dump valve (n): Automatic control valve used to maintain desired liquid levels (water or oil) in production process equipment.

emergency shutdown system (n): Any safety equipment in a designed system which initiates shutdown of all wells and production process equipment and stations when manually activated, if an abnormal condition is observed.

escape capsule (n): Device or means of evacuating platform personnel from a platform if a catastrophic event occurs.

flare boom (n): System for conducting discharged gas from process components under normal conditions (flare, vent) and abnormal conditions (relief) to a safe location for final release to the atmosphere.

flashed (v): During the production and separation process, hydrocarbons are subjected to pressure drops (high pressure to low pressure/low pressure to atmospheric pressure), which result in vapors of gas migrating (flash) from the liquids. The amount of gas emitted from the liquids is proportional to the vapor pressure drop. The greater the pressure drop, the greater the amount of gas that is flashed.

float (n): Buoyant device designed to be sensitive to oil and water or oil-water interface, internally installed in a production process component to activate or deactivate a dump valve as the liquid level rises and falls.

gas detection system (n): Automatic detection devices and system to alert personnel by an audible alarm or visual alarm to the presence of low gas concentration, 20 percent lower explosive limit (L.E.L.), and to shut off the gas source if the gas concentration approaches 60 percent L.E.L.

gaseous hydrocarbons (n): Unprocessed gas from a gas reservoir.

generator building (n): Building containing generators which are used to produce electricity for the platform.

glycol reboiler (n): The fired component of a glycol system, which boils off water that the glycol drying agent has absorbed through the contactor.

hydrocarbons (n): An organic compound of hydrogen and carbon, called petroleum.

liquid hydrocarbons (n): Hydrocarbons which are liquid at surface temperature and pressure.

liquid meter (n): Device used to measure liquids.

living quarters (n): Building where personnel live while offshore.

petroleum (n): A complex liquid mixture of hydrocarbon compounds, oily and inflammable in character.

platform (n): Structure from which wells are drilled, and/or production equipment installed, and/or living quarters installed.

produced sand (n): Sand from a reservoir that is carried with the flow stream to the surface.

production separator (n): Vessel or device for separating mixtures of oil/water/gas.

sump tank (n): Tank or metal container that is used to collect liquid hydrocarbons throughout the platform from leaks, intentional release, or overflow from hydrocarbon handling vessels.

test separator (n): A pressure rated, three-phase separation (oil-water-gas) vessel used primarily to conduct monthly evaluation tests on all producing wells.

12-foot level (n): Deck on platform that is approximately 12 feet above mean sea level.