MINUTE ITEM
This Calendar Item No. 83
was approved as Minute Item
No. 83 by the State Lands
Commission by a vote of 2
to 0 at its 2/27/96
meeting.

CALENDAR ITEM
83

A: 1, 6, 12, 13, 14, 16, 19, 21, 27, 33, 35, 37, 41, 53, 54, 67, 70, 73, 74, 78

S: 2, 3, 8, 9, 11, 15, 18, 19, 23, 27, 28, 35, 38, 39, 40

02/27/96
W9777.183
Gregory
Holly
Meier

CONSIDER ADOPTION OF EMERGENCY REGULATIONS REQUIRING INSPECTIONS OF CERTAIN OIL TRANSFER HOSES AT MARINE TERMINALS AND PROHIBITING USE OF THOSE HOSES FOUND TO BE DEFECTIVE

APPLICANT:

The Staff of the State Lands Commission

PROPOSAL:

The Staff of the State Lands Commission proposes adoption of emergency regulations to require that marine terminal operators vacuum test oil transfer hoses that have also been used in the past to transfer refined products containing certain additives. The regulations would also prohibit use of any hose that has been found to have a damaged lining or has not been tested. A copy of the proposed provisions is attached as Exhibit "A."

As emergency measures, the regulations would remain in effect for only 120 days. Staff intends to propose permanent and more comprehensive testing and inspection regulations for transfer hoses at a later date.

STATUTORY AND OTHER REFERENCES:

A. Public Resources Code Sections 8750 through 8760, inclusive
B. Gov. Code. Section 11346.1
C. 33 CFR 156.170.
D. 2 Cal. Code Regs. Article 5

AB 884:

N/A

CEQA APPLICATION:

Adoption and implementation of the proposed measures is exempt from the requirements of CEQA, pursuant to 14 Cal. Code Regs. 15061, as a categorically exempt project, Classes 7 and 8, an action by a regulatory agency as authorized by State law to assure the maintenance, restoration, enhancement, or protection of natural resources and of the environment where the regulatory process involves procedures for the protection of the environment (14 Cal. Code Regs. 15307 and 15308).

EXHIBITS:

A. Proposed Regulations: Title 2, Division 3, Chapter 1, Article 5, Section 2381. Hose Tests

B. Memorandum from Roy Mathur to Jay Phelps dated May 26, 1995; "Hose burst on T/B Millicoma at start up of cargo discharge."

C. Memorandum from Bob Chedsey to Jay Phelps dated June 30, 1995; "Additional facts concerning the oil spill at CHEVRON-Eureka; (T/B "MILLICOMA", OES#008437, 26 MAY 95)"

D. Facsimile Copy of the Accident Investigation Report prepared by Sause Bros. Ocean Towing Co., Inc.

OTHER PERTINENT INFORMATION

In recent months, Staff of the Commission's Marine Facilities Division (MFD) has discovered that certain oil transfer hoses at marine terminals are experiencing significant deterioration, giving rise to a serious pollution threat. Specifically, certain gasoline additives, such as methyl-tertiary-butyl-ether (MTBE), have been found to cause chemical deterioration resulting in separation of the inner hose lining from the hose body. The outer wall of the hose, called "the carcass" or "reinforcement," is thereby exposed to the product, accelerating the rate of deterioration, and substantially increasing the likelihood of a rupture during

subsequent use. One such spill occurred in May of 1995. Copies of memoranda and investigation reports are attached as Exhibits "B", "C" and "D".

This problem is exacerbated by the fact that many hoses used at one time to transfer lighter refined products, such as gasoline, are later put into "black oil" or "dirty" service involving crude oil or heavier products. Therefore, a hose with an undetected, damaged lining could ultimately fail while handling "black" products and cause a spill that is more likely to cause environmental harm and more difficult to contain and clean up.

This development was not discovered earlier because pressure testing, the only verification method required under existing federal regulations, does not readily reveal separated lining. Deterioration was usually discovered only after a hose ruptured or otherwise failed.

The sole positive means of detecting hose lining separation prior to carcass deterioration is to subject the hose to a vacuum test; i.e., a test which will cause the lining to pull away from the carcass in any location where separation has occurred. MFD Staff attended and observed such a test at a terminal where this practice is regularly undertaken as a standard safety measure. It was found to be very successful in revealing problems with the hose lining. MFD Staff has found no other testing procedure that identifies hose lining separation as effectively or as efficiently. This conclusion is supported by virtually every hose manufacturer.

Because of these incidents, the Chief of MFD issued a written notice to all terminal managers and barge operators drawing their attention to the problem. The notice also referred managers and operators to the recommendations contained in the Rubber Manufacturers Association's "Hose Handbook," which contains recommendations and tables for selection of compatible hose liners for various oil products.

Favorable response to the notice has been common, but not universal. Many terminal operators have treated this as a matter of urgency and have either

voluntarily vacuum-tested their hoses or planned to do so. Others, though, have made a decision not to undergo the expense or inconvenience of voluntary vacuum testing, running a significant risk of a hose rupture and oil spill.

The MFD Staff is in the process of developing comprehensive pressure- and vacuum-testing regulations for all hoses used at marine terminals in the State. The MFD Staff believes that a pressure test alone, as required by federal regulations, is not sufficient to verify the integrity of the hose. A pressure test followed by a vacuum test would more fully reveal equipment conditions. Analyses of these issues is currently underway with representatives from the regulated community, equipment suppliers and manufacturers and the U.S. Coast Guard.

Immediate action, though, is necessary, because MFD Staff's investigations have shown that a large number of oil transfer hoses currently in use in the State have been used to transfer products that may have caused a lining deterioration or separation. A rupture and spill in the near future is highly probable unless action is taken. For that reason, MFD Staff is proposing these limited emergency measures in anticipation of more permanent and comprehensive requirements.

Specifically, the emergency provisions would require that hoses that have been used to transfer high-aromatic products, such as MTBE or reformulated gasoline, be vacuum tested within 120 days of the date the regulations become effective. Such hoses that have been tested within 90 days prior to the effective date of the regulations would be exempt. Records of the required test would have to be prepared and kept at least one year for MFD review. Operators would be prohibited from using any hose that has not been tested or shows any signs of weakness or pulling away from the hose carcass.

Under the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act, generally, and Public Resources Code Section 8755, specifically, the Commission is directed to adopt regulations governing the character, performance standards and operation of all existing and proposed marine terminals within the State. Those regulations are also required to ensure the

best achievable protection of public health and safety and of the environment. Under this standard, consideration of the regulation is to be guided by the critical need to protect valuable coastal resources and marine waters, while also considering the protection provided by the measures and their technological achievability and cost. In this case, the discovered hose deterioration is significant enough to present a substantial likelihood of pollution if left uncorrected. This threat would essentially be eliminated by removing from service those hoses which vacuum testing reveals to have deterioration. The question of achievability is answered by the fact that many terminal operators are already undertaking the necessary action voluntarily. Furthermore, there are Teflon-lined hoses and combinations of liner materials on the market that have been formulated to handle a variety of substances and are not susceptible to damage from the higher aromatic products. Finally, as to cost, it is estimated that testing costs would amount to approximately $376 per hose. Replacement hoses vary in price, although a typical 8-inch-by-50-foot hose is likely to range from $2500 to $3500. However, those hoses found to have damaged linings would have to be replaced in any case, although that replacement would most likely be undertaken only after a rupture occurs. The proposed regulations would simply require earlier corrective action. The underlying goal must be to determine when a hose has a lining defect and to remove that hose from service prior to a total hose failure. No additional costs to the State or any local agencies or district will be incurred. Given that the Office of Oil Spill Prevention and Response conservatively estimates oil spill clean-up costs to average approximately $19,800 per barrel and that a ruptured hose could result in a spill of hundreds of barrels, the proposed provisions are a cost effective means of ensuring against substantial pollution events.

In consideration of the above, the Commission Staff believes that an emergency exists and that there is an urgent need for the proposed regulations to become effective immediately.

IT IS RECOMMENDED THAT THE COMMISSION:

1. FIND THAT THE ACTIVITY IS EXEMPT FROM THE REQUIREMENTS OF THE CEQA PURSUANT TO 14 CAL. CODE REGS. 15061 AS A CATEGORICALLY EXEMPT PROJECT, CLASSES 7 AND 8, AN ACTION BY A REGULATORY AGENCY AS AUTHORIZED BY STATE LAW TO ASSURE THE MAINTENANCE, RESTORATION, ENHANCEMENT, OR PROTECTION OF NATURAL RESOURCES AND OF THE ENVIRONMENT WHERE THE REGULATORY PROCESS INVOLVES PROCEDURES FOR THE PROTECTION OF THE ENVIRONMENT (14 CAL. CODE REGS. 15307 AND 15308).

2. FIND THAT THE PROPOSED EMERGENCY REGULATIONS ARE NECESSARY FOR THE IMMEDIATE PRESERVATION OF THE PUBLIC PEACE, HEALTH AND SAFETY OR GENERAL WELFARE.

3. FIND THAT THE PROPOSED EMERGENCY REGULATIONS WILL NOT GIVE RISE TO ANY ADDITIONAL COSTS TO THE STATE OR TO ANY LOCAL AGENCY OR DISTRICT.

4. FIND THAT NO ALTERNATIVE WOULD BE MORE EFFECTIVE IN CARRYING OUT THE PURPOSE FOR WHICH THE REGULATION IS PROPOSED OR WOULD BE AS EFFECTIVE AND LESS BURDENSOME TO AFFECTED PRIVATE PERSONS THAN THE PROPOSED REGULATION.

5. ADOPT REGULATIONS, AS EMERGENCY MEASURES, SUBSTANTIALLY IN THE FORM OF THOSE SET FORTH IN EXHIBIT "A", TO BECOME EFFECTIVE IMMEDIATELY UPON FILING WITH THE SECRETARY OF STATE.

6. AUTHORIZE THE COMMISSION'S STAFF TO MAKE MODIFICATIONS IN THE REGULATIONS PRIOR TO FILING WITH THE SECRETARY OF STATE IN RESPONSE TO RECOMMENDATIONS BY THE OFFICE OF ADMINISTRATIVE LAW.

7. DIRECT THE COMMISSION'S STAFF TO TAKE WHATEVER ACTION IS NECESSARY AND APPROPRIATE TO COMPLY WITH PROVISIONS OF THE GOVERNMENT CODE REGARDING ADOPTION OF REGULATIONS AS EMERGENCY MEASURES AND TO ENSURE THAT THE REGULATIONS BECOME EFFECTIVE.

8. DIRECT THE COMMISSION'S STAFF TO TAKE WHATEVER ACTION IS NECESSARY AND APPROPRIATE TO IMPLEMENT THE PROVISIONS OF THE REGULATIONS AT SUCH TIME AS THEY BECOME EFFECTIVE.

Title 2, Division 3, Chapter 1

Article 5. Marine Terminals Inspection and Management

[NOTE: ONLY THE SECTION OF ARTICLE 5 BEING ADDED IS HERE PRESENTED.]

. . .

§2381 Hose Tests.

(a) This section applies only to cargo hose strings or sections of cargo hose strings that are in service and have been used to transfer gasoline, methyl-tertiary-butyl-ether (MTBE) or other similar cyclic hydrocarbons used as gasoline additives.

(b) This section does not apply to a cargo hose string or section of cargo hose string where:

(1) The terminal operator can provide the Division with a record demonstrating that, within ninety (90) days prior to the effective date of this section, the string or section of string has been tested in accordance with the standards required under subsection (c) of this section; and

(2) That record meets the requirements of subsection (d) of this section.

(c) Operators of terminals shall, in addition to the testing and inspection requirements of subsection (j) of section 2380 of these regulations, within one hundred and twenty (120) days of the effective date of this section, vacuum test or cause to be vacuum tested each cargo hose string or section of a cargo hose string that will be used in a transfer operation. The test shall be conducted, at a minimum, in accordance with the recommended practice for Vacuum Testing in the "HOSE TECHNICAL INFORMATION BULLETIN: No. IP-11-4; Oil Suction and Discharge Hose; Manual for Maintenance, Testing and Inspection," 1987 edition, published by the Rubber Manufacturers Association (RMA), 1400 K Street, N.W., Washington, DC 20005.

(d) A carefully supervised record of the vacuum test for each length of cargo hose string shall be documented and shall include, but not be limited to, the following information:

(1) Date of test;

(2) Hose size;

(3) Hose brand;

(4) Hose serial number or identifying marks;

(5) Maximum vacuum applied;

(6) Results of vacuum test; and

(7) Results of visual inspection of interior of hose.

(e) Records of vacuum tests required by subsection (b) of this section, shall be maintained at the terminal for a period of one (1) year from the date of testing. Test records shall be made available for inspection by staff of the Division.

(f) A cargo hose string or section of cargo hose string subject to this section shall not be used for transfer operations if:

(1) During vacuum testing, the cargo hose string or section of cargo hose string shows separation of the inner lining of the hose from the carcass or noticeable blisters, bulges, tears, cuts or gouging of the of the inner lining or any other such deformity;

(2) The cargo hose string or section of cargo hose string is not tested in accordance with the provisions of subsection (c) of this section; or

(3) A record is not prepared and kept in accordance with the provisions of subsections (d) and (e) of this section.

Authority: Sections 8751, 8755, 8756, 8757 and 8758, Public Resources Code.

Reference: Sections 8750, 8751, 8755, 8756, 8757 and 8758, Public Resources Code.

. . .

State of California

State Lands Commission

Memorandum

To :JAY G. PHELPS

Date :MAY 26, 1995
File No : W 9777.85

From :ROY M. MATHUR

Telephone:(510) 741-4950
Fax :(510) 741-4970
TDD/CRS 1-800-735-2929

STATE LANDS COMMISSION
MARINE FACILITIES DIVISION
NORTHERN CALIFORNIA FIELD OFFICE
725-B Alfred Nobel Drive
Hercules, California 94547-1897

Subject :Hose burst on T/B Millicoma at start up of cargo discharge.

At **Eureka** CA, on May 26, 1995.
Hose burst / Oil spill at Chevron Oil Terminal.

In accordance with instructions received from
Jay G. Phelps
Supervisor
(Marine Facilities Division)

I attended on the open dock at **Chevron Oil Terminal** on May 26, 1995 at 1900 hrs, in order to investigate an oil spill at the Chevron Oil Terminal. As per 'California Office Of Emergency Services Hazardous Material Spill Report,' Mr Dick Laur of Sauce Brothers Ocean Towing had informed OES of a Gasoline spill from a cargo hose break at Chevron Dock. The quantity of oil spilled was reported to be **two (2) gallons.**

Prior to my attendance the following representatives of the USCG and F & G had inspected the dock in connection with the oil spill.

Mr Joaquin P. Mariante (OSPR)
Mr Mark McKaughueino (USCG)
Mr R Kimberling (USCG)

GENERAL CONSTRUCTION OF CHEVRON MARINE TERMINAL

The pier is 'T' shaped and the apron is constructed of reinforced concrete with wooden

piling with integral poured concrete dock. The walkway consists of a wooden docking of appox (6) feet width for a length of appox 150 feet, with wood stringers along under each side and strengthened with X-braces under pier structure.

The 'T' head is aligned in an appox North-South direction, whereas the walkway is constructed at appox right angles to the wharf i.e. in an East-West direction. The face of the wharf is strengthened by pile clusters at the outboard end, braced by 6x6 wooden members. At the water level are short lengths of rubber fenders fastened by chains. The cargo pipe lines, electrical conduits and fire main line run alongside the southern side of the walkway and are supported by steel brackets and supports.

THE SPILL

The T/B Millicoma (Registered in Portland Or) arrived Port side alongside at Chevron dock at **1330 hrs** on May 26, 1995 on a scheduled stop and was made all fast at **1350 hrs**. Mr Harry Mollier (Tankerman and **VPIC**)with two assistants commenced **the hook-up of three (3) hoses** in order to discharge a cargo of Gasoline and Diesel.

***NOTE:** All hoses had the required markings clearly stencilled on the hoses at both ends which read:

Oil Service
MAWP 275 PSI
Tested 4 / 20 / 95

Chevron Terminal was manned by Mr Pete Prather (Terminal Manager and **TPIC**) and Scott Parsons (assistant) who connected the T/B Millicoma hoses to the terminal manifolds. Hose connection time was logged as **1410 hrs.**

Mr Harry Mollier (**VPIC**) personally lined up the barge and Mr Pete Prather (**TPIC**) lined up the shore side lines. Before start up of cargo transfer, the **VPIC** and the **TPIC** took up their positions, near their respective manifold connections.

WEATHER: Low water for the day was **1638 hrs** and ht 2.4 feet
The **tide** was at an ebbing in a **southerly** direction.
The **wind** was blowing gently in a Northerly direction at appox **10 miles** per hour.

At **1448 hrs**, the barge **commenced pumping** the cargo. The initial start up, was at a very slow rate with the pump running at an idle speed of appox 750 RPM, delivering a pressure of appox 30 PSI compared to normal running speed of 1800 RPM delivering an appox pressure of 110 PSI on the hose.

Almost immediately, the gasoline hose burst around the mid section area squirting a jet of oil directly into the water below. At this time the hose was elevated slightly off the deck and dock by the barge crane and supported by a nylon sling.

At this moment, the **TPIC** and **VPIC** were at their stations a few feet away from the hose burst. Mr Harry Mollier (**VPIC**) upon sighting the burst, ran over and activated the '**emergency stop**' button for the pump. Within two (2) minutes, at **1450 hrs**, the pump was shut off and the valves secured shut. Mr Mollier (**VPIC**) then used the crane to hoist the leaking hose at a higher elevation in order to **drain** the cargo hose and restrict the spill.

A ribbon measuring appox 4'x12' was observed between the barge and the dock. The tankerman placed **sorbant pads and sorbant rolls** on the spilled oil at the water surface. Reportedly the spilled oil started drifting slowly in a Southerly direction with the **ebb tide**. The crew encircled the oil slick with sorbant rolls and effectively cut off the advance of the oil slick. Numerous sorbant pads were placed on the water surface to absorb the oil. As reported by Mr Pete Prather (**TPIC**) appox **two (2)** gallons of gasoline had spilled out. According to other witnesses **not more than (5) gallons** had spilled into the water below.

NOTE *: The following markings were embossed on the damaged cargo hose.

Spec no :G-2006
Sr no :0200
OIL SUCTION AND DISCHARGE
Nitrile Tube
W P : 275 PSI
Date tested: 1 / 89

At **1600 hrs** the damaged hose was replaced by a spare hose on the barge. The terminal manager Mr Pete Prather used the Chevron Oil Spill Response Boat '*RESPONSE I*' to lay and pick up the soiled sorbant pads.

***NOTE:** The boat '*RESPONSE I*' was lowered into the water but the engine was not fired up. Mr. Peter Prather (**TPIC**) used long wooden poles to lay and pick up oil absorbent sorbant pads and oars to maneuver the boat around the terminal.

At **1615 hrs** the USCG representatives from the MSO Mr Mark McKaughueino and Mr R Kimberling arrived on the scene. Reportedly after seeing the clean up in progress and the extent of the clean up already accomplished, they gave their consent to resume discharge of cargo. The OSPR representative Mr Joaquim P. Mariente arrived shortly thereafter at **1739 hrs**.

***NOTE:** The soiled pads were collected in plastic bags and stowed in the storage shed awaiting disposal.

Cargo transfer was resumed at **1615 hrs** and expected to finish at appox **0200 hrs** the following morning.

EVALUATION

DELEGATION: The oil spill in this case was successfully restricted in a short period of time since each person clearly understood his task and followed policy guide lines.

COMMUNICATION: The **TPIC** and **VPIC** were on their stations at start up and in **ear shot** of each another. This made it possible for corrective action to be taken instantly.

RESPONSIBILITY: The subordinates fully understood the responsibilities and the authority had been **delegated** properly. There were enough competent personnel at hand to carry out their duties and met the contingency.

ORGANIZATIONAL RESPONSIBILITY: The TPIC Mr Pete Prather was adequately prepared by training and experience to meet the contingency. The VPIC Mr Harry Mollier and his personnel had the required equipment and knew how to use it, thus taking timely action to restrict the spill.

CAUSE

The following reasons may have contributed to the burst in the cargo hose.

1) Constant **chafing** of the cargo hose around the mid section on the edge of piers at different terminals.

2) Wear and tear around the mid section of the hose due to the **narrow sling that suspends the hose** from the crane.

3) Inherent weak spot / bubble in the cargo hose.

4) Unreliable and doubtful records of the hose test report.

5) Unsuitable and **incompatible** cargo hoses for the kind of cargo carried by the barge.

RECOMMENDATIONS

1) Supply the barge with ' BUN' sling supports as shown in photo no 8.
Reason: This will give added support to the hose at the suspension area.
These slings are available at:

Hose handlers International Inc
Model no R S 600
Genuine Hosebun Sling
Made in Canada.

2) Supply ' DOLLYS' as shown in photograph no 7.
Reason: This will allow the hose to be lifted off the dock and thus prevent chafing against the sharp corners on the apron of the dock.
Manufactured by:

Goodyear Rubber and Supply Co
3055 Northwest Yeon Avenue
PO Box 10447
Portland Oregon 97201

3) Hydro test all hoses again at the earliest with a witness.
Reason: The hose was pressure tested in the dry-dock just over a month ago to a pressure of 475 PSI. It is rather amazing that the very same hose was pressure tested at 475 PSI but burst at a mere 30 PSI during cargo operations.

*NOTE: Attached is a copy of the Hose Test report carried out in dry dock.
Length (original) and length (pressurized) are recorded.
A test pressure of **425 PSI** is recorded on the test report.

4) Replace all existing hoses on board T/B Millicoma from Nitrile lined to Cross Linked Polyethylene lined (XLPE) cargo hoses.
Reason: The barge operators may be using oil transfer hoses that are incompatible with high aromatic products. The barge operators regularly use transfer hoses equipped with Nitrile core lining for transferring high aromatic oil products. Regular annual inspections and periodic checks showed no evidence of blistering, abrasions, flattening of hose, leakage or visible signs of deterioration. The rupture of the hose occurred within one month of a successful annual inspection and pressure test. The nitrile core hose burst during initial start-up of product transfer at a pressure less than thirty (30) psi and subsequently, resulted in the oil spill.

Nitrile lining is incompatible gasolines having an aromatic content greater than fifty percent (50%). A more compatible inner core lining for such products is 'Cross-Linked Polyethylene' (XLPE). Due to the high aromatic additives in gasoline, the Nitrile lining tends to break down earlier. XLPE lining is more favored in transferring products with a high aromatic content.

Operators must bear in mind that a visual inspection cannot verify the internal integrity of a rubber hose lining. Therefore they must ensure that the hoses used are compatible with the products transferred.

The Marine Facilities Division of the State Lands Commission would like to draw the attention of terminal and barge operators to the publications of the Rubber Manufacturer's Association. These publications include tables and recommendations for the selection and use of appropriate rubber hose. Specifically, the "Hose Handbook" IP-2/1987, Chapter 7, has guidelines for hose and coupling selection. Chapter 8 of the "Hose Handbook", includes a Table of Chemical Oil and Solvent Resistance of hose. Additionally, publication IP-8,/1982 entitled "Specifications for Rubber Hose for Oil Suction and Discharge" contains information that may be useful to operators. The above publications may be obtained from the Rubber Manufacturers Association, 1400 K St., N W.,Washington D C, 20005, Tel: (202) 682-4854.

State of California

State Lands Commission

Memorandum

COPY

To : Jay PHELPS

Date : 30 JUN 95
File No : W9777.85

From : Bob CHEDSEY

Telephone : (510) 741-4950
TDD/CRS 1-800 -735-2929

STATE LANDS COMMISSION
MARINE FACILITIES DIVISION
NORTHERN CALIFORNIA FIELD OFFICE
725 B Alfred Nobel Drive
Hercules, California 945471-1897

Subject : Additional facts concerning the oil spill at CHEVRON-EUREKA; (T/B "MILLICOMA", OES#008437, 26 MAY 95)

On my recent monitoring trip to CHEVRON-EUREKA, I happened to inquire of the barge and terminal personnel on duty what, if anything had been found to be the cause of the hose failure resulting in the above-referenced spill.

Tankerman Harry MOLLIER, of Sause Bros. Ocean Towing, who was on duty on the "MILLICOMA" at the time of the spill, advised me that the hose had been sent to an independent laboratory for failure analysis, and that preliminary results had revealed that a portion of the inner lining of the failed hose had sloughed away and separated from the hose, possibly contributing to the failure. He stressed that these were preliminary findings, and that the information that he had received had not been official or first-hand.

Terminal technician Scott PARSONS added that he had indeed found a portion of the hose lining in the fuel strainer system leading from the dock to the tankage at the facility. The portion of lining in question had been approximately three feet in length, irregularly shaped.

Mr. MOLLIER went on to say that he suspected that the Methyl Tertiary Butyl Ether (M.T.B.E.) additive in the gasoline products handled may have had a deteriorating effect on the liner, and that the hydrostatic testing done on the hoses shortly (1-2 months) prior to the failure may have even contributed to an already damaged condition of the hose. He reiterated that this was non-scientific speculation on his part.

One further point made by Mr. MOLLIER was that there is a procedure for conducting a simple, inexpensive, and non-destructive internal inspection of the hoses, which is outlined in the Rubber Manufacturers Assn. publication that we use a reference for hose handling, storage and testing. To his knowledge, such an internal inspection (which consists of drawing a vacuum on the hose, and looking through a plexiglass or similar see-through blank flange, with a light placed at the far end) is/was not done on a routine basis, at least by Sause Bros.

Pending a final analysis of the cause of the hose failure on 26 MAY 95, the idea of seeking to require internal hose inspections at the time of hydrotesting is an idea which may have some merit. In speaking with terminal personnel at refineries locally, I have found that such inspection is a common procedure at the larger facilities; I have not gathered information on the smaller terminals. In asking vessel and barge personnel, I am finding that such testing is not as common, if done at all; Once again, however, I have not gathered any empirical data on this.

In conclusion, I feel that the spill at CHEVRON-EUREKA on 26 MAY 95 may have brought to light an aspect of spill prevention that may have been previously overlooked, and can be readily addressed with a minimum of expense or effort on the part of industry. Internal inspection of hoses at the time that other testing is done may be an idea that could be advanced toward the rules and regs people for consideration.

As always, If I can be of any further assistance, please don't hesitate to call on me.

Bob - Good Report.

Kathy - Reader File.

Harold - Please call me Upon Vacuum Testing of Hoses.

Jim - Please Follow-up & Investigate.

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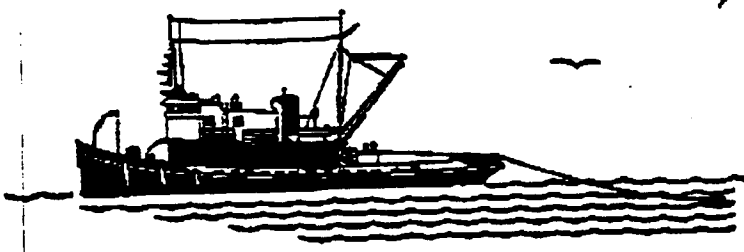
Exhibit C



SAUSE BROS.
OCEAN TOWING CO., INC.

155 E. MARKET AVE. • COOS BAY, OREGON 97420
TELEPHONE: (503) 269-5841
FAX: (503) 269-5866

TO: Roy

COMPANY: State Lands

FAX: 510-741-4975

FROM: John Lemos

COMPANY: Sause Bros. Ocean Towing Co., Inc.

FAX: (503) 269-5866

DATE: 9-11-95

SUBJECT: Incident Report

COVER PAGE PLUS 4 PAGES

Call if any questions

If there are any problems with this transmission, please call (503) 269-5841.
Thank you.

Sender: _____ Time: _____

SEP-11-1995 09:28 5032695866 P.01

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Exhibit D

ACCIDENT INVESTIGATION REPORT

Vessels: Tug: Honcho Master: D. Smith
Barge: Millicoma PIC: H. Mollier
Tankerman: S. Shay, I. Barrett

Location: Chevron Terminal in Eureka, CA.

Date of Incident: May 26, 1995 Time: 1450

DESCRIPTION

The barge was prepared for discharging cargo. Two hoses were connected to the facility header. The blue hose and blue system was designated to discharge unleaded gasoline. The PIC carried the radio and was positioned on the barge deck at midship. Another Tankerman was in the pump room house. He engaged the clutch on the blue system to initiate discharge of unleaded gasoline. Less than one minute elapsed when the terminal PIC signaled the Barge PIC to shut down. The terminal PIC heard a "pop" sound, looked over the dock rail, and saw a small stream of liquid coming from the hose.

The barge PIC instructed the Tankerman, that engaged the clutch, to disengage. At the same time, the barge PIC activated the emergency stop system. The barge PIC proceeded to the dock to determine why the terminal PIC had signaled to shut down. The barge PIC saw the hose was "dribbling" product into the water. The barge PIC repositioned the hose support slings over the section of the hose rupture. Using the barge crane, the hose was elevated to drain any remaining product to the dock drip pan and the barge fill valve.

After stopping any additional product from spilling, the barge PIC notified the tug master of the spill and to activate the spill action plan. Estimated amount spilled was 2 gallons. All personnel participated in deployment of the sorbent boom, sweeps, and pads. The USCG gave the PIC's authority to discontinue the clean up operations at 1700. Sorbent materials were cleaned off of the water and discharge resumed at 1720. Discharge was completed at 0120 on May 27.

Remedial Actions

The barge was not scheduled for a voyage in the immediate future. The investigation team decided to remove all of the hoses from the barge for evaluation. The hoses were removed from the barge on June 3, 1995. Ron Elliott, a consultant used by Chevron for testing hoses, was contacted. Mr. Elliott gave instructions on how to cut the hose for inspection and subsequent testing. Mr. Elliott arrived in Coos Bay on June 7, 1995. The visual inspection determined that the liner was completely missing from the area surrounding

the rupture and extending to approximately 2 feet on both sides of the ruptured area. Mr. Elliott believes the liner failure may have been due to chemical deterioration. He requested the hose pieces to be shipped to the lab in Richmond, California for further analysis. The hose pieces were packaged and shipped on June 8, 1995. Mr. Elliott estimated the analysis and report would be completed within one week after receiving the hose. After receiving his report additional recommendations may be forthcoming.

Hose History

The hose was manufactured in January 1989. The hose brand is Empex. The hose liner material is nitrile. We purchased the hose in August 1989. It was placed in use on the Millicoma on July 1, 1991 as a new hose. The hose was pressure tested on that same date. The hose was subsequently tested on December 16, 1991. The hose was tested on July 17, 1992; June 28, 1993; June 21, 1994; and finally on April 20, 1995. The overall elongation from manufacture's length at 10 psi to final length at 425 psi was 1.5 percent.

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The test procedures used are to lay the hose straight on a flat surface. This is either the barge deck or adjacent dock. The hose length is measured and recorded. The hose is filled with water and slowly brought to a pressure of 425 psi. The hose is visually inspected for leaks and abnormalities, such as bulging, during the time the hose is being brought up to the test pressure. The hose is also visually inspected for abrasion and kinks during the annual tests.

No visual defects were found on the external surface of the failed hose to indicate a handling error.

SYSTEM DEFICIENCIES AND REMEDIAL ACTION PLANS

We received Mr. Elliotts's report on July 31, 1995. The hose failure was due to the liner disbonding and tearing. The liner disbonding was most likely due to high aromatics in the gasoline cargo. The subsequent tearing occurred when the liquid got behind the liner, causing more disbonding, combining with the velocity of the fluid to tear the lining and rupture of the non oil resistant hose carcass. His recommendation is to use Viton lined cargo hoses for Chevron gasoline products, because the levels of aromatic hydrocarbons have exceeded 40 percent.

Immediate Action Plan: Replace all current nitrile liner gasoline cargo hoses with Viton or equivalent cargo hoses. Target Date: As soon as possible.

1. Determine the current hose specifications from our customers and manufacturers for the products carried aboard our barges.

Action Plan: The Bulk Products Manager is developing the products list. He will work with the Engineering and Design Manager to develop a specification for purchasing new hoses. The specification will be used by the purchasing manager to order new viton liner hoses. Target date: September 1, 1995

2. Determine why Viton hose liners were ordered and placed on the "Trinity" but not on the other gasoline tankers.

Cause: The Viton liners were ordered when the barge was converted for vapor recovery. Viton liners were also placed on the barge operating in Hawaii. We had an internal communication breakdown in not recognizing the need to replace the cargo hoses on other barges transporting the same gasoline products.

Action Plan: See causal analysis.

Additional recommendations not related to the current failure, but discovered during the investigation.

3. Review of purchasing procedures for identified critical parts and items. The barge hose should be considered a critical part.

Action Plan: The cargo hose will be added to the barge inspection report completed by the boat master. Cargo hose inspection will also be included on the liquid cargo log completed by the tankerman. The respective inspectors will receive training on hose inspection criteria. Estimated completion date: December 1995.

4. Documentation for annual pressure testing and the manufacture's specifications are currently maintained in the barge maintenance files with a copy on the barge. The current documentation system is adequate, however, a separate record that tracks the life of the hose would be more efficient in determining when the hose should be removed from service.

Action Plan: Develop a separate hose record. The hose record will document the date of purchase; the date the hose was placed on the vessel; pressure testing information; type of service; and other pertinent information. The investigation team will develop a draft form in cooperation with the shipyard manager. Target date: August 15, 1995

5. Develop a standard written procedure for testing cargo hoses. This will help ensure consistency of the testing methodology. The test procedures will include a method of visually inspecting the condition of the liner.

Action Plan: The investigation team is developing the draft procedure in cooperation with the shipyard manager. Target date: September 1, 1995. Specific shipyard employees will receive training in proper hose testing procedures. These employees will be internally certified as the persons responsible for completing the annual testing. Target Date: October 1, 1995.

6. We currently do not have a standard to remove cargo hoses from service based on time in service or age.

Action Plan: A removal from service will be established based on age of the hose and the information provided by regular inspection and testing. Target date: September 1, 1995. (already replaced).

CAUSAL ANALYSIS

An external communication deficiency occurred between the customer and Sause Bros. The aromatic hydrocarbon levels of the cargoes were approaching and sometimes exceeding the limits of the nitrile lined cargo hoses.

NITRILE to VITON

An internal communication deficiency occurred within Sause Bros. in failing to recognize to review all cargo hose needs when the specification for Viton lined hoses were required for some operations and not others performing essentially the same operation.

Recommended action plan: The Bulk Products Manager should periodically review the cargo composition with our customers. The information should be reviewed with operations, engineering, and safety/health to determine if changes are required in any of the systems. The customer cargo review should be performed annually or when customer cargo requirements change, whichever is more frequent.

This incident will be reviewed with all operations personnel through regularly scheduled safety meetings.

INTERNAL DISTRIBUTION:

Dale Sause, President
Jack Wilskey, Engineering Manager
John Lemos, Barge Operation Manager
Roy Mollier, Northern Area Manager
Steve Hoisington, Shipyard Manager
Jeff Browning, Southern Area Manager
Jeff Hill, Port Captain, West Coast
Doug Won, V.P. Sause Bros. Inc., Hawaii
Brad Rimell, Port Captain, Hawaii
Sam Maiuo, Tank Barge Operations Manager, Hawaii
Rick Kimberly, Loss Control/Safety Manager
Kathy Senz/Rose, Claims Manager
Doug Eberlein, Training/Personnel Coordinator

EXTERNAL DISTRIBUTION

M. E. Metcalf, Chevron USA Products Co.
Pete Prather, Chevron; Eureka, CA.