MINUTE ITEM
This Calendar Item No. C 24
was approved as Minute Item
No. 24 by the State Lands
Commission by a vote of 3
0 at its 11-9-93
Meeting.

CALENDAR ITEM

C24

A 11

S 7

11/09/93
PRC 3414
Plummer
Meier

APPROVAL OF THE RENEWAL TERMS OF
A GENERAL LEASE-INDUSTRIAL USE FOR
A MARINE TERMINAL AND APPURTENANT PIPELINES

APPLICANT:

Pacific Refining Company (Lessee)
P.O. Box 68
4901 San Pablo Avenue
Hercules, California 94547

AREA, TYPE LAND AND LOCATION:

A 20-acre parcel of tide and submerged land located in the north San Pablo Bay near the mouth of the Carquinez Strait, Contra Costa County.

LAND USE:

Operation and maintenance of a marine terminal, a vapor recovery system and appurtenant pipelines for the transfer of crude oil and petroleum products between tanker vessels and barges and Lessee's upland facility.

PROPOSED LEASE RENEWAL TERMS:

Renewal period:

Ten years beginning November 18, 1990, and ending November 17, 2000, unless terminated earlier in accordance with other provisions of this lease.

Surety bond:

$ 50,000

Public liability insurance:

Lessee is self-insured in accordance with the program on file in the Sacramento offices of the Commission.

(Revised 11/08/93)

CALENDAR PAGE	149
MINUTE PAGE	2360

CONSIDERATION:

For each of the years 1990-1993, the annual rent shall be $32,500. Pacific Refining has made these rent payments. For each of 1993-1994 and 1994-1995, the annual rent shall be $55,000. Thereafter, the annual rent shall increase by 5% per year through the rent year 1999-2000, which is the last year of the Renewal Period, as follows: 1995-96, $57,750; 1996-97, $60,637; 1997-98, $63,669; 1998-99, $66,852; 1999-2000, $70,195. Payment of the annual rent is due, in advance, on November 18 of each year.

BASIS FOR CONSIDERATION:

Pursuant to 2 Cal. Code Regs. 2003.

APPLICANT STATUS:

Applicant owns adjacent upland parcels.

PREREQUISITE CONDITIONS, FEES AND EXPENSES:

Filing and processing costs have been received.

STATUTORY AND OTHER REFERENCES:

A. P.R.C.: Div. 6, Parts 1 and 2; Div. 7; Div. 13; and Div. 20

B. Cal. Code Regs.: Title 3, Div. 3; Title 14, Div. 6.

AB 884: N/A

BACKGROUND:

On November 18, 1965, the Commission issued a lease to Sequoia Refining Corporation for installation and operation of a marine terminal. In June of 1976, the Commission consented to assignment of the lease to Lessee. After amendment, the initial term of the lease ended on November 17, 1985, but three renewal periods are permitted. On November 18, 1990, the second renewal period was scheduled to begin; it is scheduled to end November 17, 2000.

In 1990, Lessee expressed its intent to exercise its right of renewal. Paragraph 20 of the lease provides that Lessee has the right to do so upon such reasonable terms and

conditions as the State, or any successor in interest thereto, might impose. Since that time, the Commission has sought and Lessee has provided new information about current terminal operations and modifications being undertaken or proposed by Lessee at its refinery. This information has been essential to the Commission's evaluation of renewal terms and conditions.

At this time, Lessee has agreed to a new rental schedule for each year of the current renewal period, as indicated above. Paragraph 2 of the lease therefore would be amended as set forth in Exhibit C, attached hereto.

Lessee has also agreed to the following process for determining what other terms and conditions may be appropriately added to the lease:

- Upon completion of an environmental impact report (EIR) currently being prepared for a new lease under which Unocal Corporation (Unocal) could continue operation of its nearby marine terminal at Oleum, the Commission staff will review the EIR to determine what, if any, mitigation measures may be appropriately applied to Lessee's facility.

- The Commission staff will also evaluate additional information provided by Lessee regarding the environment affected by, and operation of, its facility, along with correspondence and reports regarding modifications and activities previously undertaken by Lessee at the terminal.

- After review of all this information, the Commission staff will make a recommendation to the Commission regarding additional reasonable terms and conditions to be added to Lessee's lease. Lessee is prepared to acknowledge that the Commission may impose such additional reasonable terms and conditions.

- As reimbursement for Commission staff activities to date and related to the further review process described, Lessee has agreed to pay reimbursement amounts on an as-incurred, as-billed basis, not to exceed a total of $150,000, approximately $101,000 of which the Commission has incurred and billed to date and Lessee has paid.

Lessee has also agreed to make specified contributions to the Kapiloff Land Bank Fund (The Fund), established by the Kapiloff Land Bank Act of 1982 and later amendments thereto. The money would be contributed for unspecified projects and activities consistent with the Act, such as evaluation of public trust land usage at and in the vicinity of the leased lands and determination as to how the trust may be protected and enhanced. These activities may include review of leasing practices for the purpose of improving terms for the benefit of the trust, consideration of adverse effects the Lease may have upon the trust, and identification of potential means for alleviating or compensating for those effects. The amounts paid to the Fund may also be used for costs incurred and expenditures made in responding to inquiries from Lessee, governmental entities and the public regarding the lease and its effects upon the public health and safety, the environment and the trust.

The amount Lessee would pay to the Fund would total $111,000. Payments would be made as and when directed by the Commission staff. However, payment of no more than $20,000 shall be required prior to June 30, 1994; payment of no more than $30,000 of the remainder shall be required prior to June 30, 1995; and payment of no more than $30,000 of the remainder shall be required prior to June 30, 1996. The remaining $31,000 shall be paid prior to June 30, 1997.

Lessee also requests written permission to operate a vapor recovery system (VRS) it has installed at its facility. Lessee was directed by the Bay Area Air Quality Management District (BAAQMD) to install the VRS, and, under Paragraph 10 of the lease, Lessee is required to comply with the rules and regulations of any agency of the State of California having jurisdiction. However, Paragraph 8 of the lease prohibits any substantial alterations to existing structures or erection of new structures or removal of any structures without the prior written permission of the State. Lessee notified the Commission of the BAAQMD directive and of its intention to install the VRS, but proceeded with installation without first receiving permission from the Commission. Upon learning of the installation, the Commission staff had substantial concerns about the safety of the particular system chosen by Lessee to meet BAAQMD's requirements. After considerable review, correspondence, and modifications to the VRS to address fire safety and risk reduction concerns, staff believes it is appropriate to

approve the VRS upon the condition that it is operated and maintained in accordance with the directions and recommendations of staff and representations by Lessee as contained in correspondence between the two parties from April 5 to August 16, 1993, copies of which are attached as Exhibit D-1 through D-13.

OTHER PERTINENT INFORMATION:

Pursuant to the Commission's delegation of authority and the State CEQA Guidelines (14 Cal. Code Regs. 15061), the staff has determined that:

1. Approval of terms and conditions, as herein provided for renewal, is exempt from the requirements of CEQA because the activity is not a "project" as defined by CEQA and the State CEQA Guidelines; and

2. Pursuant to the Commission's delegation of authority and the State CEQA Guidelines (14 Cal. Code Regs. 15061), the staff has determined that the approval of installation and operation of a vapor recovery system is exempt from the requirements of the CEQA as a categorically exempt project. The project is exempt under Class 1, minor alteration of an existing facility involving negligible use beyond that previously existing and, specifically, an addition of a safety or health protection device for use in conjunction with an existing facility, 14 Cal. Code Regs. 15301.

EXHIBITS:

A. Land Description

B. Location Map

C. Amendment to the Lease

D. Correspondence relating to Lessee's Vapor Recovery System

IT IS RECOMMENDED THAT THE COMMISSION:

1. FIND THAT APPROVAL OF THE PROPOSED TERMS AND CONDITIONS HEREIN PROVIDED FOR RENEWAL OF THAT LEASE DESIGNATED AS

PRC 3414.1 (THE LEASE) ISSUED TO PACIFIC REFINING COMPANY (LESSEE) IS EXEMPT FROM THE REQUIREMENTS OF CEQA PURSUANT TO 14 CAL. CODE REGS. 15061 BECAUSE THE ACTIVITY IS NOT A PROJECT AS DEFINED BY P.R.C. §21065 AND 14 CAL. CODE REGS. 15378.

2. FIND THAT AUTHORIZATION OF OPERATION OF A VAPOR RECOVERY SYSTEM IS EXEMPT FROM THE REQUIREMENTS OF CEQA PURSUANT TO 14 CAL. CODE REGS. 15301 BECAUSE THE ACTIVITY IS A MINOR ALTERATION OF AN EXISTING FACILITY INVOLVING NEGLIGIBLE USE BEYOND THAT PREVIOUSLY EXISTING AND, SPECIFICALLY, IS AN ADDITION OF A SAFETY OR HEALTH PROTECTION DEVICE FOR USE IN CONJUNCTION WITH AN EXISTING FACILITY.

3. AS A TERM AND CONDITION FOR RENEWAL OF THE LEASE, AUTHORIZE THE FOLLOWING AMENDMENT TO THE LEASE AS SET FORTH IN EXHIBIT C HERETO, WHICH SHALL RESULT IN THE ADJUSTMENT OF RENT AS OF NOVEMBER 18, 1990, AS FOLLOWS:

   A. FOR EACH OF THE YEARS 1990-1993, THE ANNUAL RENT SHALL BE $32,500, AMOUNTS WHICH LESSEE HAS PREVIOUSLY PAID.

   B. FOR EACH OF 1993-1994 AND 1994-1995, THE ANNUAL RENT SHALL BE $55,000.

   C. THEREAFTER, THE ANNUAL RENT SHALL INCREASE BY 5% PER YEAR THROUGH THE RENT YEAR 1999-2000, WHICH IS THE LAST YEAR OF THE RENEWAL PERIOD, AS FOLLOWS: 1995-96, $57,750; 1996-97, $60,637; 1997-98, $63,669; 1998-99, $66,852; AND 1999-2000, $70,195.

4. RESERVE THE RIGHT TO IMPOSE ADDITIONAL REASONABLE TERMS AND CONDITIONS FOR RENEWAL OF THE LEASE FOLLOWING COMPLETION OF AN ENVIRONMENTAL IMPACT REPORT (EIR) CURRENTLY BEING PREPARED FOR A NEW LEASE UNDER WHICH UNOCAL CORPORATION (UNOCAL) COULD CONTINUE OPERATION OF ITS NEARBY MARINE TERMINAL AT OLEUM.

5. AS A CONDITION FOR RENEWAL OF THE LEASE, REQUIRE LESSEE TO ACKNOWLEDGE THAT THE COMMISSION MAY IMPOSE ADDITIONAL REASONABLE TERMS AND CONDITIONS FOR RENEWAL OF THE LEASE FOLLOWING COMPLETION OF THE EIR FOR UNOCAL'S NEW LEASE.

6. DIRECT STAFF TO DO THE FOLLOWING

   A. UPON ITS COMPLETION, REVIEW THE EIR CURRENTLY BEING PREPARED FOR UNOCAL'S NEW LEASE TO DETERMINE WHAT, IF ANY, MITIGATION MEASURES RECOMMENDED IN THAT EIR MAY BE APPROPRIATELY APPLIED AS REASONABLE TERMS AND CONDITIONS TO LESSEE'S FACILITY;

   B. REVIEW ANY AND ALL INFORMATION LESSEE MAY PROVIDE REGARDING THE ENVIRONMENT AFFECTED BY, AND OPERATION OF, LESSEE'S FACILITY, ALONG WITH CORRESPONDENCE AND REPORTS REGARDING MODIFICATIONS AND ACTIVITIES PREVIOUSLY UNDERTAKEN BY LESSEE AT THE TERMINAL;

   C. AFTER REVIEW OF ALL THIS INFORMATION, MAKE RECOMMENDATIONS TO THE COMMISSION REGARDING ADDITIONAL REASONABLE TERMS AND CONDITIONS, IF ANY, TO BE ADDED TO LESSEE'S LEASE.

7. AUTHORIZE OPERATION OF A VAPOR RECOVERY SYSTEM (VRS), PROVIDED THAT, AS A TERM AND CONDITION FOR RENEWAL, THE VRS IS OPERATED AND MAINTAINED IN ACCORDANCE WITH COMMISSION STAFF DIRECTIONS AND LESSEE'S REPRESENTATIONS CONTAINED IN THE CORRESPONDENCE INCLUDED IN EXHIBIT D HERETO.

IT IS ALSO RECOMMENDED THAT THE COMMISSION, ACTING AS TRUSTEE OF THE KAPILOFF LAND BANK FUND (THE FUND):

1. ACCEPT PAYMENT OF $111,000 BY LESSEE TO THE FUND FOR UNSPECIFIED PROJECTS AND ACTIVITIES CONSISTENT WITH THE KAPILOFF LAND BANK ACT OF 1982 AND LATER AMENDMENTS THERETO, WITH ALL AMOUNTS PAID AT SUCH TIMES AS DIRECTED BY STAFF, BUT IN NO EVENT LATER THAN JUNE 30, 1997.

2. DIRECT STAFF TO INFORM LESSEE WHEN PAYMENTS ARE TO BE MADE, BUT IN NO EVENT SHALL PAYMENT OF MORE THAN $20,000 BE REQUIRED PRIOR TO JUNE 30, 1994; PAYMENT OF MORE THAN $30,000 OF THE REMAINDER BE REQUIRED PRIOR TO JUNE 30, 1995; OR PAYMENT OF MORE THAN $30,000 OF THE REMAINDER BE REQUIRED PRIOR TO JUNE 30, 1996.

3. DIRECT THAT THE MONIES PAID BY LESSEE TO THE FUND SHALL BE USED FOR PROJECTS AND ACTIVITIES RELATING TO EVALUATION OF PUBLIC TRUST LAND USAGE AT AND IN THE VICINITY OF THE LEASED LANDS AND DETERMINATION AS TO HOW THE TRUST MAY BE PROTECTED AND ENHANCED. THESE ACTIVITIES MAY INCLUDE, BUT NOT BE

LIMITED TO, REVIEW OF LEASING PRACTICES FOR THE PURPOSE OF IMPROVING TERMS FOR THE BENEFIT OF THE TRUST, CONSIDERATION OF ADVERSE EFFECTS THE LEASE MAY HAVE UPON THE TRUST, AND IDENTIFICATION OF POTENTIAL MEANS FOR ALLEVIATING OR COMPENSATING FOR THOSE EFFECTS. THE MONEYS PAID TO THE FUND MAY ALSO BE USED FOR COSTS INCURRED AND EXPENDITURES MADE IN RESPONDING TO INQUIRIES FROM THE LESSEE, GOVERNMENTAL ENTITIES AND THE PUBLIC REGARDING THE LEASE AND ITS EFFECTS UPON THE PUBLIC HEALTH AND SAFETY, THE ENVIRONMENT AND THE TRUST.

EXHIBIT "A"

Two contiguous parcels of submerged land lying in the bed of San Pablo Bay, situate in the City of Hercules and the City of Rodeo, Contra Costa County, State of California and being more particularly described as follows:

PARCEL 1

A strip of submerged land 50 feet wide lying 25 feet on each side of the following described centerline:

COMMENCING at the most northerly corner of Parcel 2 as shown on that Parcel Map MSH-1 on file in the office of the county recorder of said county; thence S 04° 00' W 150.58 feet along the Agreed Boundary Line as shown on said parcel map, to the TRUE POINT OF BEGINNING; thence N 37° 47' 18" W 508 feet; thence N 10° 09' 18" E 6,588.66 feet to a point designated as Point "A" for the purposes of this description and the end of the here-in-described centerline.

PARCEL 2

BEGINNING at the above-mentioned Point "A" thence N 77° 00' 30" E 712.00 feet; thence N 12° 59' 30" W 400.00 feet; thence S 77° 00' 30" W 1300.00 feet thence S 12° 59' 30" E 400.00 feet, thence N 77° 00' 30" E 588.00 feet to the point of beginning.

This description based on the California Coordinate System Zone 3.

END OF DESCRIPTION

Prepared J. Collins Checked Leroy F. Weed

Reviewed [illegible] LAND SURVEYOR Date 3/14/74

LICENSED LAND SURVEYOR
LEROY F. WEED
NO. 3000
STATE OF CALIFORNIA

CALENDAR PAGE	156
MINUTE PAGE	2368

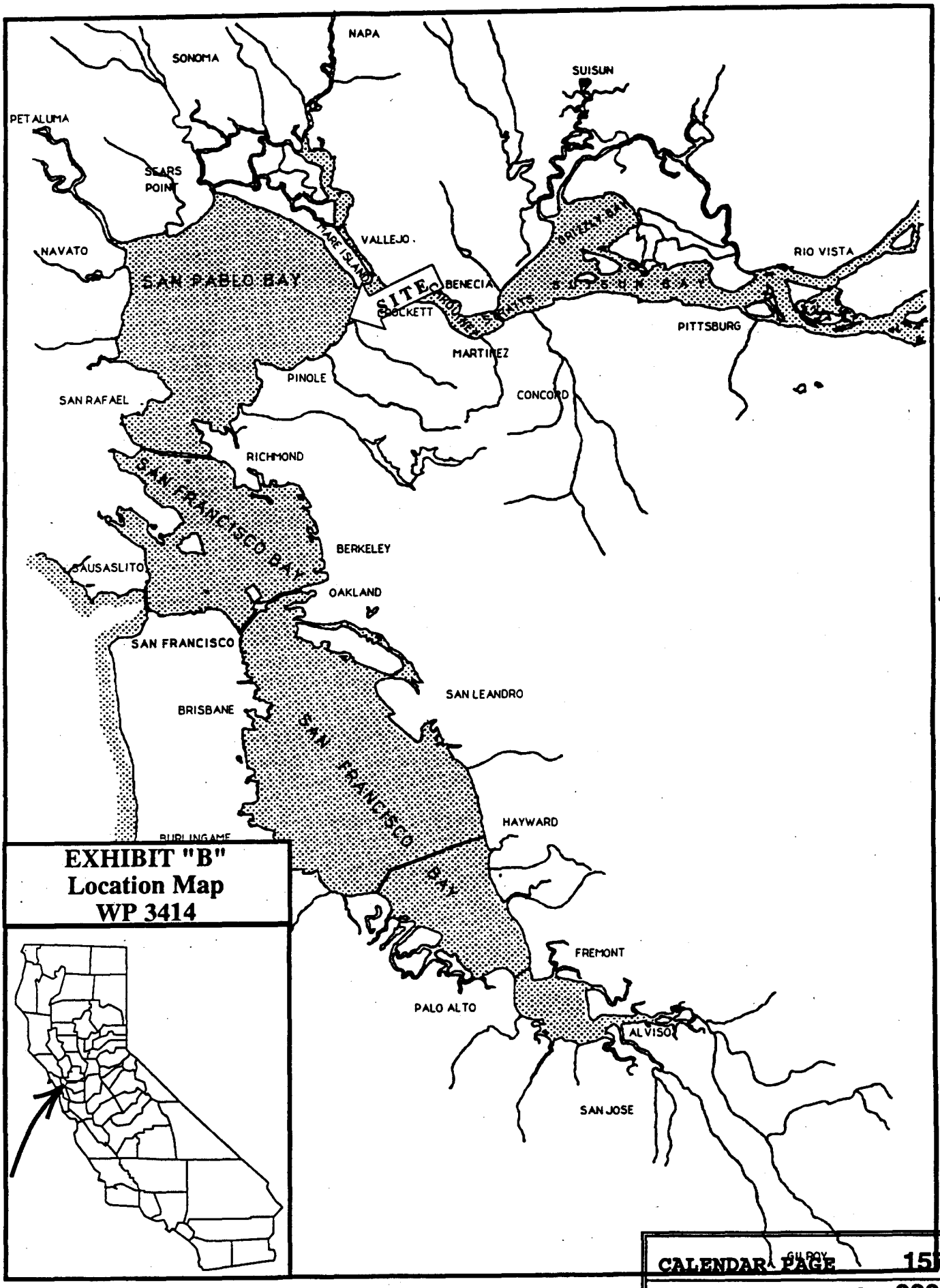


EXHIBIT "B"
Location Map
WP 3414

STATE OF CALIFORNIA
STATE LANDS COMMISSION
AMENDMENT OF LEASE P.R.C. 3414.1

WHEREAS;

A. Pacific Refining Company (Lessee) currently holds Lease PRC 3414.1 (the Lease) issued by the State of California upon approval by the State Lands Commission (the Commission);

B. That lease permits Lessee to renew the lease for a period from November 18, 1990, to November 17, 2000, upon such reasonable terms and conditions as the State, or any successor in interest thereto, might impose;

C. As agent for the State, the Commission is authorized to impose reasonable terms and conditions upon the Lease as a condition for renewal thereof;

D. An amendment to the lease to increase rent in accordance with an agreed-upon schedule is a reasonable term and condition for renewal of the lease;

NOW THEREFORE, it is agreed by and between the parties hereto that paragraph 2 of the Lease is hereby amended to read as follows:

2. (1) The firm annual rental shall be in accordance with the following schedule:

(a) For the period from November 18, 1990, to November 17, 1993, retroactively, the annual rent shall be $32,500, such amounts having been paid by Lessee prior to this amendment;

EXHIBIT C

CALENDAR PAGE	158
MINUTE PAGE	2370

(b) For the period from November 18, 1993, to November 17, 1995, the annual rent shall be $55,000;

(c) For the period from November 18, 1995, to November 17, 1996, the annual rent shall be $57,750;

(d) For the period from November 18, 1996, to November 17, 1997, the annual rent shall be $60,637;

(e) For the period from November 18, 1997, to November 17, 1998, the annual rent shall be $63,669;

(f) For the period from November 18, 1998, to November 17, 1999, the annual rent shall be $66,852;

(g) For the period from November 18, 1999, to November 17, 2000, the annual rent shall be $70,195.

(2) If the lease is renewed for another period beginning November 18, 2000, and the Commission does not impose a new annual rental as a term and condition for renewal, then the annual rent for that period ending November 17, 2000, shall continue thereafter, except that it shall be increased 5% each year as of the first date of the new renewal period.

(3) The annual rental shall be payable annually in advance at such place as may be designated from time to time, provided that rental paid in advance shall not be refundable in the event of termination of said lease prior to expiration of the term thereof.

The effective date of this Amendment shall be and is November 18, 1993.

This Agreement will become binding on Lessor only when duly executed on behalf of the State Lands Commission of the state of California.

PACIFIC REFINING COMPANY

*BY _____

TITLE _____

ADDRESS _____

_____

_____

DATE _____

STATE OF CALIFORNIA
STATE LANDS COMMISSION

BY _____

TITLE _____

DATE _____

The issuance of this lease amendment was authorized by the State Lands Commission on

_____

*In executing this document, attach a certified copy of the Resolution or other document authorizing execution on behalf of the Lessee.

EXHIBIT C

STAT. OF CALIFORNIA

PETE WILSON, Governor

STATE LANDS COMMISSION

LEO T. McCARTHY, *Lieutenant Governor*
GRAY DAVIS, *Controller*
THOMAS W. HAYES, *Director of Finance*

EXECUTIVE OFFICE
1807 - 13th Street
Sacramento, CA 95814

CHARLES WARREN
Executive Officer
(916) 322-4105
FAX (916) 322-3568

April 5, 1993

Mr. Ralph J. Edwards, Director
Environmental and External Affairs
Pacific Refining Company
P.O. Box 68
Hercules, CA 94547

Subject: Notice Regarding Proof of Safety and Condition of Vapor Recovery System (VRS) at Hercules Terminal

Dear Mr. Edwards:

This letter is to inform you that your use of the Vapor Recovery System (VRS) at the Hercules Terminal is to cease until the Marine Facilities Inspection and Management Division of this Commission has determined that it is in good repair and that it can be safely operated in accordance with State and Federal regulations. The reasons for this action are stated below. This course of action is taken as an alternative to declaring the lease by which you occupy the property to be in breach. That remedy will be invoked if we cannot be assured that the VRS is safe to operate.

As you know, we have expressed from the outset concerns regarding the particular technology and placement of the VRS chosen by your company. We have also informed you that the VRS not be put in place or operated without the approval of the State Lands Commission (SLC) given in conjunction with your pending lease application. Described generally, the problem areas are in fire safety, design and tie-down, which we have indicated on Attachment I.

This matter has come to a head with a suspension of amendment to your Coast Guard Letter of Adequacy. Information garnered during an SLC inspection revealed that a fire had occurred in the VRS months earlier. Further review has generated evidence that the Coast Guard was not informed of this event prior to its issuance of an amendment to the Letter of Adequacy for your Operations Manual which allows your use of the VRS. This problem is compounded by what appears to be a shifting of the VRS on the dock, bringing into question its stability and safe operation.

As a starting point to resolving this problem, please contact Jim Hart of our office at (310) 499-6400 to set up a time to describe the actions which will be taken by Pacific Refining to assure the safe operation of the VRS.

Sincerely,

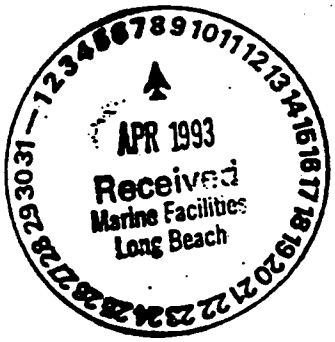
Charles Warren
Executive Officer

Attachment

cc: J. M. McDonald, Captain
U.S. Coast Guard
Bill Bacon, Terminal Supervisor
Pacific Refining Company

CALENDAR PAGE	162
MINUTE PAGE	2374

bcc: Jane Sekelsky
Gary Gregory
Kevin Mercier
Mark Meier
Blake Stevenson



CALENDAR PAGE	163
MINUTE PAGE	2375

ATTACHMENT 1

April 1, 1993

W 9777.14

Pacific Refining Marine Terminal
Vapor Recovery System (VRS) Fire Safety, Design and Tie-Down Improvements

A. Sponge oil stripper, T-15, may start up with a combustible atmosphere, but it is not isolated from the compressor suction scrubber, V-31, inlet via the light gas recycle line with a detonation arrester. Our concern is that a detonation in T-15 could propagate to V-31, to the inlet vapor compressor and to all the hydrocarbon processing vessels downstream of the inlet vapor compressor. A detonation arrester should be installed in the light gas recycle line.

B. The flame arrester, FA-51, installed in-line between the lube oil separator, V-42, and inlet compressor after cooler, E-3, is not designed for detonation arrester service and needs to be replaced with a detonation arrester.

C. High and low level alarms and a high level shut down should be installed on the dock sump to shut down the VRS, close product MOVS, and shut down any shipping pumps on shore to prevent the sump from overflowing in case of an upset. The high and low level alarms and high level shutdown should annunciate in the refinery control room and the wharf shack.

D. The following ten improvements to the wharf fire and safety provisions, which were recommended by PrimaTech, Inc., should be implemented:

1. Develop a wharf emergency plan identifying coordination between emergency aid resources, including the lines of communication for potential hazard scenarios.

2. Provide a special Oil Movement Head Operator for supervision of the start-up of the VRS and to provide dedicated cargo operation support in the refinery control room.

3. Evaluate the means for emergency evacuation and the requirements for a boat on the wharf.

4. Regularly test the performance of the fire pump and evaluate the reliability of the electrical power supply.

5. Provide automatic fire pump start, or remote start capability at the fire water monitors and the fire hose reels.

6. Relocate the fire water monitors to the wharf walkways and provide a fixed firewater spray system for exposure protection of the VRS.

7. Provide fire fighting foam capability for the fire water monitors and fire water hand lines for a minimum of 10 minutes foam injection.

8. Provide fusible plug type fire detection and combustible gas detection in the skid base of the VRS.

9. Provide manual fire alarm stations for activation of the wharf firewater system and alert of the refinery control room staff.

10. Relocate the drum storage to a curbed location away from the VRS.

E. Install an additional fire water pump with an independent power source to provide fire suppression capability in case of failure of the main fire pump and/or its power supply.

F. Provide a list of qualified individuals who are available for training of wharf technicians on the start-up, operation and shut-down of the VRS and associated wharf duties.

G. Provide a complete report on any fires and/or deflagrations and their causes in the VRS before and after certification by the USCG approved certifying entity, Babet Engineering. Describe what has been or will be done to prevent recurrence of any fires and/or deflagrations.

H. A seismic analysis of major VRS components and tie-down to the concrete deck is required. This work shall be performed by a California licensed civil or structural engineer and is subject to review by Commission staff. The as-built condition of the substructure tie-down to the concrete deck is not satisfactory and will require modifications. In addition, some of the major components tied to the VRS steel frame are not sufficiently anchored.

Applicable sections of API RP 2A, 19th edition, should be used as a primary reference for the seismic analysis. In-structure response spectra shall be calculated and used to determine appropriate lateral and vertical forces for VRS components.

PACIFIC REFINING COMPANY
A Joint Venture of Sinochem and The Coastal Corporation Subsidiaries

P.O. BOX 68 (510) 799-6[illegible]
4601 SAN PABLO AVENUE FAX (510) 7[illegible]2
HERCULES, CALIFORNIA 94547

April 28, 1993

Kevin Mercier
Assistant Division Chief
State Lands Commission
330 Golden Shore, Suite 210
Long Beach, California 90802-4246

Re: Proof of Safety and Condition of Vapor Recovery System at Hercules Terminal

Dear Mr: Mercier:

Per a conference call with your staff on April 15, concerning the above subject matter, the attached is the data we indicated we would supply. As we stated during the call, the operation of the Vapor Recovery System is mandated by the Bay Area Air Quality Management District. Therefore, it is very critical that we resolve the issues of concern as soon as possible. In the mean time, we have obtained a Variance from the BAAQMD to operate the wharf without penalty.

Please direct all correspondence concerning this matter to me.

Sincerely,

Ralph J. Edwards
Director, Environmental & External Affairs

RJE:eab
Attachment
f:\user\braue\rje\ltr\slc-vrs.ltr
cc: J.M. McDonald, Captain
US Coast Guard

CALENDAR PAGE	166
MINUTE PAGE	2378

EXHIBIT D - 2

ATTACHMENT
RESPONSE TO STATE LANDS COMMISSION
MARINE VAPOR RECOVERY (MVR) COMMENTS

Listed below is Pacific Refining's response to the State Lands Commission letter dated, April 1, 1993. Responses are given in the same order as the original letter.

A. Detonation Arrester in Sponge Oil Stripper Recycle Line

The practice of operating petrochemical facilities and equipment through the flammable range is commonly accepted in industry and is safe with operating safeguards. Examples include the loading and unloading of marine barges and cone roof tanks. Both of these applications allow for the introduction of air into the equipment as they are being emptied. The primary precaution in preventing a fire is the elimination of all ignition sources which hinders the completion of the fire triangle.

During the startup of the MVR, air is introduced to pressurize the system in order to reach refrigeration temperatures required to perform vapor recovery. It is accepted that during this period parts of the system will pass through the flammability range.

Precautions taken during this period include:

- Elimination of all possible ignition sources.
  The lube oil separator is being replaced since it has been identified as a potential ignition source.

- Installation of high temperature shutdown and alarm points in the system.

- Isolation of the system from the vessel. The vapor header is isolated from the vessel during this entire period. In addition, two detonation arresters will contain any incident from propagating from the system and to the vessel.

It is Pacific's position that the system can be operated in safe and effective manner without the installation of a detonation arrester in the recycle gas line.

B. **Removal of Flame Arrester FA-51**

The installation of flame arrester FA-51 was made after a high temperature incident occurred in the Lube Oil Separator. Although this flame arrester was not rated for the discharge pressure of the inlet compressor, it was installed as an additional safeguard until modifications could be made.

The discharge pressure of the inlet compressor is 120 psi. There's no certified flame or detonation arresters that are rated above 10 psi. The installation of either type of arrester, while an additional safeguard, would be only cosmetic in nature. We have been notified by the manufacturer that the specific arrester installed may already be rated as a detonation arrester at much lower pressures (<10 psig). Should this be correct, we will leave the arrester in place.

C. **High/Low Level Alarm and High Shutdown for Wharf Sump**

The MVR system is manually drained to the sump during its operation and is also normally blocked in during this period. These two systems are independent in function. Installation of additional alarms and a high level shutdown would not provide any additional protection.

D.1. Included in Pacific's Wharf Operations Manual and in the OPA 90 Oil Spill Response Plan is Pacific's Emergency Response Plan that identifies emergency aid resources and includes the lines of communications for potential hazard scenarios. Copies of these documents were given to your Vallejo facility.

D.2. Pacific is currently reviewing corporate guidelines for the establishment of new positions within the work force. In addition, we will review the need for such positions versus our current staffing.

During normal working hours, cargo operation support is provided by the Terminal Department. Normal working hours are defined as 0730 to 1600 hours. After and before these hours, support is provided by the Control Room. The Shift Supervisor assumes responsibility for the wharf operation and provides any needed support and direction.

D.3. Pacific has reviewed the requirements for a boat on the wharf necessary for emergency evacuation. Based on this review, Pacific will provide a small inflatable craft for evacuation purposes.

D.4. Pacific will develop a schedule, as part of our ongoing wharf operation, to regularly test our fire pump.

During the recertification period of the Vapor Recovery System, Pacific will evaluate the reliability of the electrical power system. Pacific currently plans to install a larger generator to supply power to the pump in case of a power failure.

D.5 As noted in D.6., Pacific will install either a water deluge system or a fixed monitor for fire fighting purposes on the VRS. Regardless of which system we install, it will have remote start capability.

D.6. Pacific will require additional study of this recommendation. As an alternative, Pacific may elect to install a water deluge system versus a fixed monitor.

D.7. Pacific will provide some type of fire fighting foam capability for the VRS. As noted above, once we decide on the type of fire fighting system, deluge versus fixed monitor, foam will be placed on the wharf.

D.8. The majority of the area under the skid is open vented, therefore, we do not believe that a gas detection alarm is required.

D.9. Manual fire alarm stations will be installed in conjunction with a modified fire fighting system. Once activated, the system will alert the control room. As you may be aware, the wharf is presently under constant surveillance via remote cameras. Thus, the wharf operators have a continuous backup in the system.

D.10. The drum storage has been relocated to a curbed location away from the VRS.

E. Pacific will install a larger generator to provide power to the fire pump in case of a power failure.

F. A list of qualified individuals will be provided in the near future.

G. A report on any fires and/or deflagrations in the VRS before and after certification by the USCG and their causes, as well as what has and/or will be done to prevent it's recurrence will be provided you. The report is near completion and should be in your office within the next two (2) weeks.

H. As you are aware Pacific and it's contractor, who will be performing the seismic study, have been waiting on a response from State Lands concerning it's proposal on the study. Pacific contracted with EQE Engineering Consultants in July, 1992 to perform the study which began in October, 1992. Once approval of the proposal is received we will begin work immediately.

With regards to the State Lands position that the substructure tie-down to the concrete deck is not satisfactory, Pacific disagrees. Additional information regarding the tie-down and the major components will be provided you.

STATE OF CALIFORNIA PETE WILSON, Governor

STATE LANDS COMMISSION
MARINE FACILITIES INSPECTION
AND MANAGEMENT DIVISION
330 Golden Shore, Suite 210
Long Beach, California 90802-4246
(310) 499-6312
TDD/CRS 1-800-735-2929
FAX (310) 499-6317

May 13, 1993
W9777.14

Ralph J. Edwards
Director, Environmental and
External Affairs
Pacific Refining Company
P. O. Box 68
Hercules, CA 94547

Dear Mr. Edwards:

RE: **Proof of Safety and Condition of Vapor Recovery System (VRS) at Hercules Terminal**

This letter is in response to Pacific Refining Company's (PRC) letter of April 28, 1993, that addresses PRC's explanations, alternatives, and plans of action for the critical concerns expressed in the Executive Officer's letter of April 5, 1993. Problem areas considered completed satisfactorily are noted. Other items below include further discussion/clarification in reply to your proposals, and/or items which can be completed when plans of action are completed:

A. **Detonation Arrester in Sponge Oil Stripper Recycle Line**

SLC staff accepts PRC'S explanation. Action complete.

B. **Removal of Flame Arrester, FA-51**

SLC staff accepts PRC'S explanation and plan of action. Advise determination of rating for in-place arrestor.

C. **High/Low Level Alarm and High Shutdown for Wharf Sump**

High and low level alarms are required to be installed on the dock sump and annunciate in the refinery control room and wharf shack. This is item 51 on page 13 of the HAZOP completed on the VRS. These alarms are to annunciate upon detecting

abnormal sump levels caused by any of the following: pump controller left in off position; sump pump high level switch failure; valve, piping, and/or vessel failure; sump pump failure; loading arm failure; sump tank failure. These alarms will prompt shutdown of loading or discharge operations before the sump overflows or leaks, even in the event of operator error or incapacitation.

D. PrimaTech Recommended Improvements to the Wharf Fire and Safety Provisions

D.1. SLC staff accepts PRC'S explanation. Action complete.

D.2. Since the primary wharf alarm system during cargo operations is the operator (refer to HAZOP and SAFE Chart), a second qualified individual is required on the wharf for supervision of the start-up of the VRS. This is a reduction in the requirements forwarded in the SLC April 5 letter.

D.3. SLC staff accepts PRC'S plan of action. Advise when boat is in place.

D.4. The fire pump must be tested periodically in accordance with the requirements of the NFPA 20 - Centrifugal Fire Pumps standard. The pump capacity and discharge head shall be evaluated to the original specifications. SLC will review PRC'S report on the reliability of the electrical power supply to the wharf. Provide report when available.

D.5. PRC agrees to install remote start capability for the fire pump at all the fire water monitors and all the fire hose reels on the wharf. Advise when completed.

D.6. Relocating two monitors to the walkways would provide improved application onto the barge berth as outlined on P. 17 of the PrimaTech Report. Since the wharf arrangement requires several additional monitors dedicated for protection of the VRS, a practical approach is to provide a water curtain around all four sides of the VRS or a deluge system automatically activated with a fusible plug heat detectors located in the VRS skid as described on P. 17 of the PrimaTech Report. The fusible plug detection system shall automatically activate the fire pump, shutdown the VRS and alarm the refinery control room.

D.7. In the April 5 SLC letter, this item addresses providing fire fighting foam capability for the <u>whole</u> <u>wharf</u> as outlined on P. 19 of the PrimaTech Report. SLC requires PRC to implement recommendation #10 on P. 19 of the PrimaTech Report.

D.8. Since propane is used in the VRS refrigeration system, SLC requires that PRC install combustible gas detectors on the VRS skid. The gas detectors should alarm the common wharf trouble alarm and refinery control room at a point not higher than 25% of the lower explosive limit (LEL), shutdown the VRS and prompt shutdown of cargo operations at a point not higher than 60% of the LEL as described in API RP 14C, C1.4b., P.82.

D.9. SLC staff accepts PRC'S plan of action.

D.10. Action complete.

E. Installing a generator of sufficient electrical capacity, dedicated to power the fire pump at full flow capacity, and that will automatically start and provide power to the fire pump upon failure of the pump's main electrical supply will satisfy SLC concerns regarding the possible failure of the main fire pump's power supply.

F. SLC staff accepts PRC'S plan of action.

G. SLC staff accepts PRC'S plan of action.

H. EQE, under the direction of PRC is in the process of performing a seismic evaluation of the VRS skid and components. The present "tie-down" of the VRS skid to the concrete deck is not acceptable and a new retro-fit design will be required. Under mutual agreement between PRC and SLC staff, SLC technical staff has been communicating directly with EQE, to discuss concerns about the seismic vulnerability of the VRS and other related structural issues. We understand that EQE has passed on our concerns to appropriate PRC staff. Both the applied seismic loads and the retro-fit design will be reviewed by SLC technical staff when available.

Pacific Refining may cease reporting on items noted as complete. SLC is also eager to resolve these issues of concern as soon as possible. Mr. Jim Hart continues to be the primary SLC point of contact for this matter. His phone number is (310) 499-6400.

Sincerely,

Kevin Mercier
Assistant Division Chief

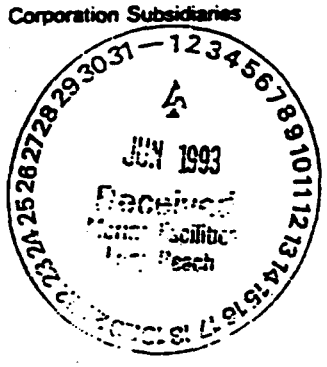
cc : Charles Warren
J. M. MacDonald, COTP SF Bay

bcc: Jane Sekelsky
Mark Meier
Pete Johnson
NCFO

PACIFIC REFINING COMPANY
A Joint Venture of Sinochem and The Coastal Corporation Subsidiaries

P.O. BOX 66
4901 SAN PABLO AVENUE
HERCULES, CALIFORNIA 94547

(510) 799-6000
FAX (510) 799-6042



May 26, 1993

Kevin Mercier
Assistant Division Chief
State Lands Commission
330 Golden Shore, Suite 210
Long Beach, California 90802-4246

Re: Proof of Safety and Condition of Vapor Recovery System at Hercules Terminal

Dear Mr. Mercier:

This letter will provide State Lands Commission a status update of Pacific Refining Company's effort to address concerns of the Commission. We are currently working with the United States Coast Guard (USCG) and its third party certifying entity, Babet Engineering, to recertify the MVRS. Your approval is necessary in order to run a "hot" test on or near June 3, 1993, which is needed to complete recertification.

Pacific's current schedule for test runs show "dry" runs with air only beginning June 1, 1993. The "dry" runs consist of starting the unit and running it for an extended period of time under Babet Engineering's direction and supervision. Additionally, should the following update prove satisfactory to the Commission, Pacific requests that upon recertification we be permitted to operate the MVRS on an ongoing basis.

The following is an update of our current effort to address the commission's concerns:

B. We are currently working with the third party certifying entity as to the whether the flame arrester is acceptable as a permanent component in the system. Its utility is negligible since it is not rated for service at this pressure. To date, there are neither flame or detonation arresters rated at these pressures.

In the interim, we have installed a removable piping spool place in the system where the flame arrester can be either removed or installed depending on the outcome of the third party certifying entity's decision.

C. A high level alarm is currently installed on the wharf sump that annunciates in the refinery control room. A low level alarm would serve no purpose in preventing a spill / fire scenario and therefore is not installed in the system.

Upon an alarm, it is standard procedure for the control room operator to notify the Wharf Technician (Tech) by radio. This procedure is necessary since the Wharf Tech could be attending to activities aboard the vessel at dock. For this reason, we do not propose to install annunciators in the wharf shack.

f:\user\braue\rje\ltr\slcvrs.ltr

CALENDAR PAGE	175
MINUTE PAGE	2387

EXHIBIT D - 4

We are examining the feasibility of installing a pump running detector that would indicate if the pump not running in a high sump level condition. This relay connection, if possible, will be installed by June, 1993. We will advise you of our progress in this area.

D.2 The MVR system is designed to be started and operated by the Wharf Tech on duty prior to cargo transfer operations. The need for a second operator during startup is unnecessary.

Since the MVR unit requires 1-2 hours to cool the unit down to refrigeration temperatures, the unit is normally started 2-4 hours prior to actual cargo operations. This startup is accomplished by the Wharf Tech on duty.

D.4 We have and will continue to test the pump to NFPA 20 standards.

D.5 The wharf fire pump is already equipped with a remote start capability from the electrical room adjacent to the wharf shack.It allows the operator to start the pump from either this location or locally at the fire water pump. These two locations provide operator access on either side of a fire that would presumably be situated at either berth or on the MVR unit. See attached fire safety assessment.

D.6 We have studied the possibility of relocating both fire water monitors and have found that this modification may actually limit its intended fire fighting capability of the loading platform, where a oil based fire would be situated. We are working with a registered fire protection engineer to possibly relocate the single monitor adjacent to the MVR unit. We will advise you of the outcome of this study.

The fire water monitors have a limited reach (100') for fire fighting effectiveness. In the current configuration, there are two points of fire fighting attack for a fire located at the ship berth where the majority of all loadings take place. In addition, a foam spray as well as fire hose coverage can be positioned for a barge fire.

The wharf is equipped with eight 50 ft. fire fighting hoses.

We are installing a fire water deluge system over the MVR unit. This system will automatically activate upon startup of the fire water pump. We do not agree that fusible plug heat detectors are necessary to activate the fire water pumps or the deluge system. Since the wharf is manned during the operation of the MVR unit (when the greatest threat of fire exists), wharf personnel would activate the fire water system. The MVR unit is de-energized when not in use. The deluge system will be installed by August, 1993. See attached fire assessment report.

D.7 Fire fighting foam will be installed on the two monitors that protect the loading platform where an oil base based fire would be situated. The monitors located on the walkways do not have an effective reach (> 100') to the loading platform. See attached fire assessment report.

D.8 Due to the open air configuration of the MVR unit, a gas detector would have limited value in detecting a hazardous atmosphere condition unless there was a major propane release caused by a system rupture, during MVR operation. In this case, the unit would be isolated and shutdown by the refrigeration's PLC control. The fire deluge system would be activated by the Wharf Tech on duty.

However, as required by our BAAQMD Permit to Operate, we must maintain the unit leak free and gas tight.

H. We are designing specialized lateral shear connectors to withstand a 1.0 G force. These will be fabricated and installed by August, 1993.

E. Pacific will be installing a generator of sufficient electrical capacity, dedicated to power the fire pump at full flow capacity, and that will automatically start and provide power to the fire pump, sump pump and dock lighting. Upon failure of the pumps and other noted equipment main electrical suply. The subject generator will be delivered and installed by August, 1993.

H. Work is proceeding in this area.

We would appreciate responses to both of our requests as soon as possible in order to proceed with our current schedule.

Sincerely,

Ralph J. Edwards
Director, Environmental & External Affairs

RJE:eab
cc: Myles Butler, Paul Miller, Judy Moore, John Sakamoto, Guy Young

f:\user\braue\rje\ltr\slcvrs.ltr

Eichleay Engineers Inc.
of California

Suite 600, 1390 Willow Pass Road, Concord, California 94520 • 510-689-7000 • FAX 510-689-7006

May 25, 1993

Ralph Edwards
Director, Environmental and
External Affairs
Pacific Refining Co.
P.O. Box 68
Hercules, CA 94547

Re: Proof of Safety and Condition of Vapor Recovery System (VRS) at Hercules Terminal

Dear Mr. Edwards,

We have reviewed both the May 13, 1993 letter from Kevin Mercier to you and the PrimaTech report regarding their recommendations for safety improvements. Based on this as well as a physical inspection of the facility we offer the following conclusions and recommendation with supporting explanatory information.

D.4 Pacific agrees and will comply. The fire pump will be inspected and operated weekly and performance tested annually. The performance will be compared to the original specifications. The test procedure will comply with the requirements of NFPA 20.

D.5 The fire pump for the loading platform has remote start capability from two locations. The locations have been selected to assure they are immediately accessible to the operator when an emergency occurs and took into account the operators duties and the emergency response plan. Based on the analysis, the optimum locations to assure immediate activation of the fire pump, are at the platform switch room adjacent to the operator house and on the escape route on the west breasting platform.

D.6 The location of the fire water monitors was based on their safe access during an emergency and the effective reach of the water stream to fire risk areas. Since their installation, the addition of the VRS skid somewhat inhibits the effectiveness of the west monitor. It will be relocated to the west, accessible from the catwalk, approximately 10 feet from the west edge of the platform. In this location, it will protect the ship berth and can effectively reach over the VRS skid to the barge berth providing protection for both the barge berth and the VRS skid. The easterly monitor on the platform is properly located.

Though the risk is very low, should a fire occur, it most likely would be at the area of higher usage. Evaluation of risk took into account that cargo transfers involving ships occurs approximately 15% of available platform time while barges account for only 2% of the time. Exposure is about 7 times greater for the ship handling area of the platform.

In addition to the fire water monitors which can provide area protection, incipient stage fires will be responded to by the trained operator who is in attendance 100% of the time the platform is activated and in use. First aid fire fighting devices include, foam/water line hose

reels or dry chemical extinguishers.

D.7 The entire loading platform has fire fighting foam protection provided by two monitors which have been equipped with foam capability. Live hose reels with foam capability provides reliable protection for incipient stage fires. This level of protection is consistent with industry practices and with the design and operation of this loading platform.

D.8 The addition of combustible gas detectors on the VRS skid has been evaluated and determined to be impractical and will not provide an additional level of protection. Reasons are:

- As reported in the PrimaTech findings, the loading platform is adequately ventilated as defined in API 500 and NFPA 30, the applicable standards. After inspecting the VRS skid, there are no confined spaces for vapor to collect or where it may be in the presence of an ignition source. The openings within the base of the skid are less than 18" in depth and there are no ignition sources within the skid.
- The loading platform has been classified Class I, Div 2 and all electrical devices meet the requirements of the area classification. Other ignition sources are not permitted on the platform during operation.
- The loading platform has a trained person in attendance 100% of the time the equipment is energized and is in operation. This person continuously monitors the operation and will take emergency action should a leak develop.
- There is not a significant quantity of propane refrigerant contained in the VRS equipment; this limits the potential risk and consequences.
- Should a leak develop, the operator will immediately activate the VRS skid deluge system which will dilute and disperse vapor to avoid conditions which could lead to ignition and fire.
- During the connecting, disconnecting and transfering of flammable liquids, it is possible that small quantities of vapor may be present from time-to-time. A vapor detection system would be expected to detect the vapor and likely result in spurious nuisance trips when no risk is present.

Sincerely,

D. L. Blomquist, P.E.
Registered Fire Protection Engineer, CA.

David L. Blomquist, P.E.
Process Safety Specialist, Registered Fire Protection Engineer

Eichleay Engineers
of California

Experience Summary

Dave has over thirty-years years experience where he worked with Chevron Corporation and many of its subsidiary companies listed below. He worked in many areas which included refinery process operations, maintenance, engineering and risk assessment. He is a recognized expert in fire protection engineering and the principles of loss prevention through process safety management. Has developed and maintained corporate fire loss prevention engineering standards. Responsibilities have included loss prevention design reviews and risk assessment surveys at hundreds of major petroleum and chemical processing, storage & handling facilities. The size of projects ranged from single plants to major integrated refinery processing complexes with total constructed value up to $1 billion.

Fields of Competence

He played a leadership role in the initiation and development of Process Hazards Management (PSM) and has extensive experience in the application of the elements of PSM. Is knowledgeable in on & off-shore oil production, refining processes, pipeline, marketing, chemical processes, warehousing, tank field design, LPG storage, process control centers & building life safety. He has years of experience on code writing committees and is knowledgeable in application and interpretation of related codes and developing and presenting equivalences to approval agencies.

Credentials and Professional Affiliations

B.S. Mechanical Engineering - Oregon State University
Registered Professional Fire Protection Engineer - California
Society of Fire Protection Engineers
American Petroleum Institute, Committee on Safety & Fire Protection
National Fire Protection Association, Technical Committee on Flammable & Combustible Liquids

Key Projects

- Manager of corporate fire loss prevention program for world wide petroleum refining, production, marketing, chemical, pipeline, shipping, mining, office building and computer center operations.
- Loss prevention design review of more than 50 major petroleum processing plants, chemical plants, oil production platforms, and on-shore oil and gas separation plants, project sizes, $100 million to $1 billion.
- Loss prevention design specification, design & construction review for a $600 million refinery expansion project including crude units, hydro-processing, gas recovery, sulfur recovery, cat reforming and jet fuel sweetening.
- Design and construction of tank field with 525,000 to 750,000 barrel storage tanks and a major LPG storage facility with unique spill containment design.
- Extensive fire protection/risk assessment review of major Saudi Arabia oil company producing and refining facilities.
- Investigated and determined cause of more than 15 incidents of fire/explosion and provided technical litigation support and expert testimony.

Key Client Relationships

- Chevron Corporation
- Chevron Chemical Company
- Gulf Oil (Great Britain) Ltd.
- Chevron Overseas Petroleum Inc.
- Chevron Shipping Company
- Chevron USA Inc., Producing, Refining & Marketing
- ARAMCO, Saudi Arabia
- BORCO, Grand Bahama
- Warren Petroleum Company
- Chevron Pipeline Company
- Chevron Canada Resources
- Chevron U.K. Ltd.

W 9777.14

PACIFIC REFINING COMPANY

A Joint Venture of Sinochem and The Coastal Corporation Subsidiaries

May 28, 1993

Kevin Mercier
Assistant Division Chief
State Lands Commission
330 Golden Shore, Suite 210
Long Beach, Ca. 90802-4246

RE: Proof of Safety and Condition of Vapor Recovery System at Hercules Terminal

Dear Mr. Mercier

Per your request attached is a copy of the report on the fires and or deflagrations that occurred in the VRS before and after certification by the USCG. The report goes into detail as to the possible causes as well as what has been done or will be done to prevent it's recurrence.

Should you have any questions concerning this report please contact me.

Sincerely,

Ralph Edwards

Director, Environmental and External Affairs

cc: Paul Miller
Judy Moore
Bob Berkland
John Sakamoto

P. O. BOX 68
HERCULES, CA 94547
(415) 799-8000
FAX (415) 799-8042

CALENDAR PAGE	181
MINUTE PAGE	2393

EXHIBIT D - 5

INCIDENT REPORT
MARINE VAPOR RECOVERY UNIT

PACIFIC REFINING
HERCULES, CALIFORNIA

May 24, 1993

Eichleay
ENGINEERS INC. OF CALIFORNIA

Project No. 4514

CALENDAR PAGE	182
MINUTE PAGE	2394

INCIDENT REPORT
MARINE VAPOR RECOVERY UNIT

PACIFIC REFINING
HERCULES, CALIFORNIA

May 24, 1993

By: .....

CALENDAR PAGE	183
MINUTE PAGE	2395

Table of Contents

I. Introduction

II. High Temperature Incidents

III. MVR Skid Movement

IV. Recommendations

Attachments and References

I. Introduction

Listed below are the findings of the investigation of the incidents as cited by the USCG in its suspension of Pacific Refining's MVR Letter of Adequacy. The incidents investigated include:

- High temperature excursions (fires) in the MVR unit, and
- Possible movement of the MVR skid.

II. High Temperature Incidents

Executive Summary

On March 4, 1992 and November 19, 1992, high temperature events (presumed fires) occurred in Pacific Refining's MVR unit during trial and startup exercises. The fires were detected by smoke emanating both from the system's vent and leakage from a fire damaged valve. The fires were contained each time by a shutdown of the system, thereby restricting available oxygen in the closed system.

Marine vessels were not connected to the system during the incidents. A barge was present at the dock during the second incident.

The cause of these incidents is strongly linked to the installation of a demister pad in the lube oil system.

It is believed that a localized high temperature may have been present on the demister pad. This temperature may have reached autoignition temperatures (350 degrees C.) due to the exothermic reaction of lube oil oxidation on the steel wire mesh at stagnation points.

A second explanation is that static charges on the demister pad provided an ignition source for the ignitable vapors that could be present during each system startup. Other scenarios investigated but dismissed include auto-ignition of compressed lube oil vapors, pyrophorics, and mechanical sparking of the compressor.

The system is being retrofitted with a larger lube oil separator that will minimize lube oil losses without the use of a demister pad.

Background

On March 4, 1992, a high temperature event occurred in Pacific Refining's MVR unit as part of the unit's commissioning activities. During this time, Pacific, in conjunction with the MVR manufacturer, were performing vapor flow tests by drawing air into the system to verify its flow capacity. No vessels were present at the wharf.

After running the unit for a period of 2-4 hours, smoke was noticed emanating from the system's vent and from the packing of control valve, PCV-10. The system was immediately shutdown by personnel at the unit. This action snuffed out the fire. Flames were not visible during the event.

Inspection of the unit revealed the following:

- A charred demister pad in the Lube Oil Separator, V-42.

- Temperature damaged parts of backpressure control valve PCV-10.
- Cracked and peeled paint on the pipe section from V-42 to PCV-10.

Retrofits were then performed to prevent a similar incident from incurring. See Retrofits on page 6.

The system was run without similar incident for seven months from March through November. During this period, high lube oil losses of > 1 gallon / operating hour were encountered.

In late October - early November, Pacific reinstalled the demister pad to cut down on the high lube oil losses in the compressor system. The pad was installed without its gasket to improve its electrical grounding contact to prevent a buildup of static electricity. On November 19th, a second incident occurred with similar results. The system was shutdown automatically by sensors that were installed after the first incident.

In neither incident, there was no indication that excessive heat migrated back to the compressor. All hot spots were localized to the separator and its downstream piping.

System Operation

The portion of the system that was involved in the fire was the Lube Oil Separator, V-42, of the Vapor Inlet Compressor, C-40, system. This shown is shown on attached P & ID drawing F-102. Vapors are drawn into the MVR unit using the suction action of the vapor inlet compressor. This compressor, known as a oil-flooded rotary compressor, mixes large amounts of lubrication (lube) oil with the inlet vapors that are drawn into it. Together, the vapors and lube oil are compressed and discharged into the Lube Oil Separator vessel.

The oil serves as a dynamic lubricant in the system and acts as a coolant to draw the excess heat away from the vapors. This heat is formed in the process of compressing the vapors from atmospheric pressure to 120 psig. The temperature of the discharged flow is 220 degrees F.

The Lube Oil Separator is a large reservoir where the liquid oil is separated from the vapor. The liquid oil will tend to fall to the bottom of the vessel where it is cooled, filtered, and recirculated to the inlet of the compressor. The de-oiled vapor stream, which still contains trace lube oil mists, is then passed through a demister pad where oil droplets coalesce and fall by gravity into the oil reservoir of the Separator. De-Oiled and de-misted vapors then exit the Separator from its overhead piping and continue in the system.

A backpressure control valve, PCV-10, located downstream of the Separator regulates the system's pressure. This pressure is necessary to efficiently startup and operate the system as well as to obtain the required degree of vapor recovery efficiency.

Investigation

Pacific and Schedule A examined the possible causes for the incident. These are shown in Table I. It was determined that either autoignition or static electricity on the demister pad was the source of the ignition for the event.

Table I

Potential Root Cause	Findings
Localized High Temperature of the Demister Pad Due to the Exothermic Reaction of Lube Oil Oxidation	1. The rapid oxidation of lube oils is an exothermic reaction. 2. Localized stagnation or a buildup of oxidized lube oil residues within the demister pad may have created a local hot spot that reached autoignition temperatures of about 350 degrees C (> 600 degrees F.).
Static Electricity Buildup on the Lube Oil Separator Demister Pad	1. A local electric[illegible]ial could possibly develop in the weaves of [illegible]ister pad. 2. Circumstantial Evidence ▲ Fires occurred shortly after demister pad was installed and run in a standby mode for 2-4 hours. ▲ The system was operated for extensive periods with no incidents when the demister pad was removed. 3. The construction of the demister pad cannot assure that positive grounding is obtained. 4. Positive grounding of the pad, with its gaskets installed, was questionable during the first incident. Grounding staples in the gasket provided grounding protection. 5. The actual lube oil sample was found to have a conductivity value of > 2000 picoSiemens / meter.

Potential Root Cause	Findings
Pyrophoric Iron Deposits	1. Pyrophorics are usually deposited at the low points of a liquid filled section. The Separator's oil level is monitored and filled as required at the start of each run. A low level shutdown would have immediately shut the system down prior to exposing any pyrophorics. 2. The system was purged with air at the beginning and end of each run to oxidize any pyrophorics that may have been deposited during the MVR's operation. 3. Oil filters, located downstream of the shaft driven recirculation pump in the lube oil system, removes particles over 50 microns.
Mechanical Sparking of the Compressor Components	1. The nature of a oil flooded rotary compressor makes it an unlikely that it would generate a mechanical spark unless it is run dry of lubrication oil[Ref. 1]. This condition will shutdown the system due to low oil level. 2. Oil filters, located downstream of the shaft driven recirculation pump in the lube oil system, removes particles over 50 microns.
Auto-Ignition of Compressed Lube Oil Vapors.	1. Previous studies have shown that the auto-ignition of lube oils in rotary compressors are highly unlikely[Att. 6]. 2. The outlet conditions of the compressor are far below those required to generate auto-ignition of the vapors[Ref. 2].

The demister pad is a metal woven material similar in construction to a steel wool pad. This pad is placed at the vapor outlet of the Separator to coalesce any lube oil mists that could be carried into the system.

The demister pad, in operation, is coated with lube oil and operated at 120 psig at 220 degrees F. Under these conditions, some oxidation of lube oil would be expected. The rapid oxidation of lube oils on the pad may have been the primary source of ignition. As lube oils oxidize in the presence of air, exothermic heat is given off. This heat could have resulted in localized hot spots (350 degrees C.) in the stagnant areas of the pad. If a hot spot approached autoignition temperatures, a deflagration may have resulted.

In addition, the demister pad acting as a dielectric which collected electrical charges deposited by the lube oil mists could have been a potential ignition source. Although the demister pad was positively secured to the Separator with positive metal to metal contact and that the lube oil was found to be fully conductive, it is believed that a coalescing pad could develop a local electrical potential in the weaves of its construction. This potential could be the source an static spark causing ignition.

Pacific Refinery ran actual conductivity tests of the actual lube oil after the incidents and found conductivities greater than 2,000 picoSiemens / meter. This exceeds the guidelines for conductive oils (> 50 pS /m) as defined by the International Safety Guide for Oil Tankers & Terminals[Ref. 3] and by the Industry Standard on Control of Static Electricity, API 2003[Ref. 4].

Both incidents occurred during extended commissioning runs of 2-4 hours with the demister pad installed in the lube oil separator. During these events, air is swept through the system to pressurize and cool the unit to its vapor recovery system temperatures of - 25 degrees F. The removal of the demister pad, after each incident, yielded incident free operation for 5-7 months.

System Retrofits

The following retrofits were made shortly after the March 4th. incident. They included.

- Removal of the demister pad from the Lube Oil Separator.
- Retrofit of a high temperature shutdown point, TAHH-40, immediately downstream of the Separator.
- Installation of the flame arrester, FA-51, downstream of the Separator.

The removal of the demister pad allowed any entrained lube oil mists to carry over into the system. This carry over would result in larger lube oil losses that must be replaced at the beginning of each run.

The high temperature shutdown point served to shutdown the entire MVR skid should an internal high temperature (fire) develop. This temperature probe is set at 350 degrees F. It was this device that automatically shutdown the system as designed on the November 19, 1992 incident.

The flame arrester was installed as an additional safeguard in the system. The investigator notes that neither flame or detonation arresters exist that are rated for the discharge pressure of this system. The discharge pressure of the inlet compressor is 120 psig. There no certified flame or detonation arresters that are rated above 10 psig. The installation of either type of arrester, while an additional safeguard, would only be cosmetic in nature.

The November 19th incident spurred Pacific and Schedule A to redesign the system that would have acceptable lube oil losses without the use of a demister pad. Work is underway to commission a new system using a larger Separator vessel (42" versus 24" diameter) that

would not require a demister pad. The larger diameter will decrease vapor velocities in the Separator by over 65 %, and therefore not allow the carry over of lube oil mists into the system.

A similar barge mounted refrigeration unit, the Jovalan barge, has operated for several years with the same type of compressor system. According to Schedule A, its designer, its separator does not contain a demister pad.

The design will include a resized control valve, PCV-10, duplex strainers for improved filtering capabilities, as well as the high temperature probe initially installed after the first incident. The flame arrester is being considered for removal since it offers no additional protection to the system.

III. MVR Skid Movement

Executive Summary

Physical inspections by the States Lands Commission indicated that the MVR skid may have moved since its initial installation.

This conclusion was drawn from its alignment of a 1/4" overlap of the skid over its pedestal base on one side and a 1/4" underlap on the opposite side. In addition, several bolts securing the skids were found to be loose under the wharf structure. Subsequent inspections found that although the skid was bolted into place, construction crews probably did not securely fasten and torque the bolts to its design values.

Background

The vapor recovery skid is secured into placed with 13 - 1-1/4" bolts. Five are located on the longitudinal-outboard side of the skid, with the remaining eight on the longitudinal inboard side of the skid.

The alignment and position of the skid were made after the installation of these anchors. It is believed that the overlapping and underlapping of the skid occurred after the anchors were placed and grout pads poured.

A thorough inspection of the skid and its anchorage was made in December, 1992. It found that although the anchors were not all securely fastened to its design values, that the skid did not move as indicated by loosening the piping spools that connect the skid to the wharf deck. In addition, a comparison of photographs taken during the initial certification in February, 1992 and in April, 1993 show that the skid had not moved.

Construction crews will make modifications to the MVR skid's anchorage to meet design values.

IV. Recommendations

Based upon available information of the high temperature incidents, we recommend that the following actions be performed:

1. Complete the installation of larger Separator vessel.
2. Permanently remove the demister pad in the Separator.
3. Remove the flame arrester downstream of the Separator.
4. Perform an extended run test in air (> 12 hours) to verify the system's integrity with the modifications.

We understand that Pacific is currently in the process of executing these recommendations. The successful execution of an extended run test should satisfy that these modifications were effective in preventing future incidents.

Recommendations for structural modifications should be executed as stated in Schedule A's letter, dated December 30, 1992.

It is noted that the findings in this report are based on a post mortem of events that occurred over the past year +. Information gathered included record searches and interviews with numerous Pacific and contractor personnel. Since an investigation into these incidents was not launched at that time, some information is imprecise or general in nature.

Attachments

1. Piping and Instrument Diagram, F-102.
2. Pacific Refining Letter to Schedule A, dated November 20, 1992.
3. Schedule A Letter to Pacific Refining, dated November 23, 1992.
4. Schedule A Letter to Pacific Refining, dated December 11, 1992.
5. Schedule A Letter to Pacific Refining, dated December 30, 1993.
6. CPI Engineering Services, Inc Letter to Eichleay Engineers, dated May 21, 1993.

References

1. C.S. McCoy, F. J. Hanley; National Petroleum Refiners Association, Fire Resistant Lubricants for Refinery Air Compressors; 1975; Page 11.
2. H.W. Perlee, M.G. Zabetakis; U.S. Bureau of Mines; Compressors and Related Explosions, page 11.
3. Oil Companies International Marine Forum, International Safety Guide for Oil Tankers & Terminals; Third Edition.
4. American Petroleum Institute; RP-2003, Protection Against Ignitions Arising Out of Static, Lighting, and Stray Currents.

PACIFIC REFINING COMPANY
A Joint Venture of Sinochem and The Coastal Corporation Subsidiaries

P.O. BOX 68
4901 SAN PABLO AVENUE
HERCULES, CALIFORNIA 94547

(510) 799-6000
FAX (510) 799-6042

November 20, 1992

Schedule A, Inc.
9894 Bissonnet, Suite 888
Houston, Texas 77036

Subject: Marine Vapor Recovery Unit - Oil Separator Fire

Dear Mr. Ward,

As we discussed by telephone on 11/19 and 11/20, we had a fire which occurred in the oil separator vessel of the inlet vapor compressor, C-40, on the marine vapor recovery unit. This fire appears to be of a similar nature to the one that occurred soon after the unit was installed. As you recall, after the first occurrence the oil separator element was removed and the unit was run several times without the element. Because of high oil losses, the replacement element which you provided was reinstalled without the internal gaskets to improve grounding contact between the separator element and the vessel and the oil drain tube was properly installed, according to your recommendations. We have checked the lube oil conductivity periodically and have found the oil to be highly conductive. Even with these precautions, the element ignited and produced temperatures high enough to melt parts of the metal element in the separator and the rubber seal in the downstream back-pressure controller. The high temperature shutdown that you added after the first fire did provide a rapid shutdown of the compressor and appears to have limited the damage from this fire.

In our discussion on 11/20, you indicated that you were proceeding with the design of a new oil separator vessel to eliminate the need for an oil separator element. Also, you indicated that the back-pressure regulator would be replaced with a different and larger design. Based on your experience with the vapor recovery unit on the Jovalin barge, which you said does not use an oil separator element and has operated successfully for several years, we will continue to operate the unit without the separator element. We are, however, still uncertain as to the cause of the ignition in the separator. We believe that it is critical to know that this is a phenomenon related to the separator element and that operation of the unit without the element is entirely safe. Please provide your analysis of this situation and how the new equipment will eliminate the possibility of another ignition. I believe that we need an answer on this as quickly as possible so that we can continue to operate the unit.

Sincerely,

Kevin Krase

cc: P. Miller
M. Ruehle
J. Moore, Esq. - Long Beach

CALENDAR PAGE	195
MINUTE PAGE	2407

SCHEDULE A, INC.

November 23, 1992

Mr. Kevin Krase
Pacific Refining Company
P. O. Box 68
Hercules, California 94547

Dear Kevin:

This is in response to our telephone conversations of 11/19 and 11/20 and your letter of 11/20. Based on your observations on the oil separator element and our previous observations of the separator element, I feel confident that the origin of the fire in the separator was internal to the separator element. Our likely solution is to, therefore, replace the current separator with a larger vessel that will not require mesh internals to reduce lube oil losses to an acceptable level.

Like yourself, we wish to establish the physical phenomena to explain why the separator element is responsible for the source of ignition. We have several hypotheses for how this has occured. However, prior to commenting in greater detail, we wish to first do a more detailed search of available industry literature on the topic. I shall inform you immediately upon our arriving at our conclusions and whether or not those conclusions dictate a different and/or additional measures to be taken beyond increasing the size of the lube oil separator.

I shall keep you informed of the progress on design and procurement for the replacement separator. Given the fact that we have a short holiday week this week, I do no anticipate we will have full answers in the next two days. Any data or updates that we have available shall be brought to your attention as soon as possible. In your absence this week, I shall contact Mike Ruehle as necessary.

Considering the expense involved in replacing the separator and making other modifications to the unit, I would like to request that we work out, at a minimum, a partial payment plan for the outstanding change orders due Schedule A so that some of these monies may be used to assist in effecting the modifications.

In closing, I would like to thank you for your prompt communication bringing this problem to Schedule A's attention. I believe you can note that we have as always in the past when information is communicated to us, have responded promptly. I would like this episode to serve as a model for how we can communicate and work together to solve problems so that Pacific Refining may have a vapor recovery unit that you feel is safe, reliable, and effective.

Sincerely,

Bron W. Ward
Vice President

cc
Mike Ruehle

BWW/slw

CALENDAR PAGE	196
MINUTE PAGE	2408

9894 Bissonnet • Houston, Texas 77036-8229
(713) 777-7771 • Fax (713) 777-7781

SCHEDULE A, INC.

December 30, 1992

Mr. Kevin Krase
Pacific Refining Company
P.O. Box 68
Hercules, CA 94547

KEVIN KRASE
JAN 04 1993
ENGINEERING

Dear Kevin:

This letter is to update you on our observations and conclusions following Skip Lankford's inspection of the anchor bolts and skid location for the Marine Vapor Recovery Unit at your Hercules wharf.

The Vapor Recovery Skid has thirteen 1-1/4" anchor bolts. Five of the anchor bolts are positioned on the barge side of the skid, while the remaining eight anchor bolts are on the tanker side of the skid. The anchor bolts are attached to the wharf with two different methods depending on the location of the particular anchor bolt. Five of the thirteen anchor bolts are located such that they are imbedded in the 4' thick pile cap beams for the wharf. These anchor bolts have a hole approximately twelve inches in depth, drilled into the pile cap, with the anchor bolt sealed in place with epoxy grout. The remaining eight anchor bolts penetrate the wharf through the 1' thick web section in between the 4' thick pile cap beams. These anchor bolts have also been secured in place with epoxy grout, with an additional square steel plate secured with double nuts on the underside of the wharf surface.

During his inspection, Skip verified that approximately a 1/8" gap between the bottom of the wharf and the support plates on the through-wharf anchor bolts existed. The double nuts appeared to be tight. The top side of all the anchor bolts were examined and, while all of the top nuts have been fastened more than hand tight, it did not appear that any had been torqued to a value that would prevent the washer beneath the nut from sliding when struck with a wrench. Furthermore, not all of the anchor bolts had washers located between the top nut and the skid.

In order to determine whether the skid has moved during the past ten months from its original position and therefore, placing a bind on the piping and the inlet nozzle of the Vapor Compressor, the pipe to compressor flange connection was loosened on line #10"P-107 which comes from V-31 off-skid to C-10 which is on-skid. Once the bolts were removed from the flange connection on the 6" strainer located on top the compressor, the pipe moved approximately 1/4" in the longitudinal direction of the skid, but did not move in the lateral direction, indicating that in all probability the skid has not moved from its original location.

Based on the preceding observations from Skip, I have reached the conclusion that the anchor bolts for the Vapor Recovery Unit were never properly tightened, both top and bottom. While the bolts that penetrate the wharf's surface have been grouted in with epoxy grout and, in theory, should not require a bottom backup plate, I still feel it is prudent to tighten the bottom nuts so that the support plate is flush against the bottom of the wharf. The nuts on the anchor bolts on top of the wharf require tightening to prevent skid movement in the event of a substantial impact by a tanker on the wharf.

CALENDAR PAGE 197
MINUTE PAGE 2409

9894 Bissonnet • Suite 888 • Houston, Texas 77036-8229
(713) 777-7771 • Fax (713) 777-7781

Schedule A proposes, as a solution to the loose anchor bolts, to first tighten up the nuts on the bottom side of the wharf, then place a tack weld to each of the double nuts. Then the nut should be tacked to the under side of each support plate. On the top side of the wharf, we propose to fabricate a square plate approximately 3/8" thick with a 1-3/8" hole cut in the plate so that it may be installed over the existing anchor bolt. The plate would then be welded to the skid structure, the nut would then tightened, and either double nutted or tacked in position, to make certain that vibration will not allow the nuts to back off.

On the question of whether the skid has moved from its original position, I am of the opinion that it has not. I reached this conclusion based on no lateral misalignment of line #10"P-107 to the Inlet Vapor Compressor. The original indication that perhaps the skid had moved was due to the skid being tight against the anchor bolt slots on the barge side, with some additional spalling of the grout on two of the anchor bolts on the barge side at the Vapor Compressor end of the skid. Eddie Aylor indicated that during installation of the skid, the three anchor bolts on the Vapor Compressor end of the skid on the barge side did not fit in to the slots properly when the skid was set in place with the barge crane, so nuts were placed on the anchor bolts which were then struck with a sledge hammer to move the bolts to the outermost end of the slot so that the skid would be able to fit over the anchor bolts. This, I believe, accounts for the spalling of the grout. In the final analysis, it is fairly immaterial as to whether the skid has or has not moved. The piping to the Inlet Vapor Compressor can be loosened and the flange connections rearranged such that stress can be removed from the inlet connection to the Vapor Compressor.

Schedule A has reviewed this foundation design for the wharf as a result of the original questions posed to you by the State Lands Commission. Once the anchor bolts are properly tightened, you should expect no movement of the skid due to either the maximum allowable impact loading on your wharf or due to seismic conditions. Furthermore, as to the question of whether the gaps between the skid runners and the concrete grout compromise the foundation design, the answer is a definitive "no." For bearing surface on the bottom of the skid to the grout runners to properly transfer load from the skid to the wharf, only approximately 1/10th of the total skid runner area need contact the concrete surface.

We are in the process of arranging for the proper tensioning of the anchor bolts to occur along with other work on the Vapor Recovery Unit. Please contact me should you have any questions concerning this issue.

Sincerely,

Bron W. Ward

Bron W. Ward
Vice President

BWW/pda

CALENDAR PAGE	198
MINUTE PAGE	2410

CPI ENGINEERING SERVICES, INC.
P.O. Box 1666, Midland, MI 48641-1666
Phone: 517-496-3780 Fax 517-496-2313

FACSIMILE MESSAGE

DATE: May 21, 1993

TO: Eichelay Engineering

FAX NO: 510-689-7006

ATTN: Dave Blomquist

FROM: Chris Thelander

Total Number Pages Including Cover Sheet: 15

Dave:

Please find attached *Compressor and Related Explosions*, a U.S. Bureau of Mines Information Circular, by Henry Perlee and Micheal Zabetakis[1963]. On page 9, figure 4, there is a chart detailing the effects of increasing pressure on the autoignition temperatures of a phosphate ester-based lubricant(PE) and a mineral oil-based lubricant. Our CP-1516 Series products, polyalkylene glycol-based fluids, fall in between these two types of fluids in terms of general stability. It is a safe assumption, based on our experience with these products, and given the stability-related nature of this physical property, that this median position will be maintained for this characteristic. There are also some comments(page 4) regarding the presence of iron oxides and the "catalytic nature" of these compounds. This may also hold true for the alkanes present in the system.

Given the data shown in this paper, I would estimate the autoignition temperature of the CP-1516 Series lubricants to be ~287°C at 265 psia(see Table 1, page 11). At atmospheric pressure, I would estimate the autoignition temperature of these fluids at ~400-450°C(this parameter will be checked 24May93). Even taking the general stability of these compounds to be as low as that of mineral oil, the conditions in your system would still need to be greater than 3000 psia and 180°C for this product to produce the types of results that you are seeing.

There is still the unknown factor of the hydrocarbons. These compounds would have considerably lower autoignition temperatures than our lubricant and are present, along with air, at unknown compositions. In any case, I would tend to believe that the alkanes would autoignite a long time(much lower temperatures and pressures) before

the lubricant would. Even a static electrical charge(per our phone conversation) would not be likely to ignite the lubricant before the alkanes.

I hope that this information is helpful. I will be in touch with regards to the cost of running autoignition temperatures at elevated pressures. If you have any further questions or comments in the mean time, please feel free to contact John Tolfa or me at the above numbers.

Regards,
CPI ENGINEERING SERVICES, INC.

Chris Thelander
Chemist

cc: J. Tolfa

STATE OF CALIFORNIA PETE WILSON, Govern

STATE LANDS COMMISSION
MARINE FACILITIES INSPECTION
AND MANAGEMENT DIVISION
330 Golden Shore, Suite 210
Long Beach, California 90802-4246
(310) 499-6312
TDD/CRS 1-800-735-2929
FAX (310) 499-6317

June 3, 1993
W 9777.14

Ralph J. Edwards
Director, Environmental and
External Affairs
Pacific Refining Company
P. O. Box 68
Hercules, CA 94547

Dear Mr. Edwards:

Subject: **Proof of Safety and Condition of Vapor Recovery System (VRS) at Hercules Terminal**

This letter is in response to Pacific Refining Company's (PRC) letter of May 26, 1993, and PRC'S consulting engineers, Eichleay Engineers Inc., referenced letter of May 25, 1993. As discussed in the telephone conversation between you and me on May 28, PRC has permission to hot test the VRS provided the "dry runs" are completed satisfactorily by the USCG approved third party certifying entity. Please keep the SLC Vallejo field office informed of the schedule for these tests, as they will witness them as operations allow. The following action items are considered either complete or require continuing action by PRC (the numbers used are per all previous correspondence on this subject):

B. **Removal of Flame Arrester, FA-51**
SLC staff accepts PRC'S plan of action. Action item complete.

C. **High/Low Level Alarm and High Shutdown for Wharf Sump**
SLC staff accepts PRC'S explanation and plan of action. Action item complete.

D. **PrimaTech Recommended Improvements to the Wharf Fire and Safety Provisions**

D.2. SLC staff accepts PRC'S explanation. Action item complete.

CALENDAR PAGE 201
MINUTE PAGE 2413

EXHIBIT D - 6

D.3. Action item open.

D.4. SLC staff accepts PRC'S consulting engineers, Eichleay Engineers, plan of action. Action item complete.

D.5. SLC staff requires remote start capability for the fire pump at all the fire water monitors and hydrants. Advise when completed.

D.6. SLC staff agrees with PRC installing a water deluge system for the VCS skid, but SLC requires that the deluge system, at a minimum, be automatically activated with fusible plug heat detectors located in the VRS skid. The fusible detection system shall automatically activate the fire pump, shutdown the VRS, and alarm the refinery control room. Since PRC intends to have only one Wharf Tech dedicated to transfers on the wharf, and the Wharf Tech "could be attending to activities aboard the vessel," this automatic system will provide the best available protection. Advise when completed. SLC Staff agrees with Eichleay Engineers relocation of the west fire monitor from the west edge of the main loading platform to the catwalk. Advise when completed.

D.7. SLC staff agrees with Eichleay Engineers providing foam capability to the two monitors nearest the main platform. SLC requires PRC to implement, as a minimum, all the other items as detailed in recommendation #10 on P. 19 of the PrimaTech Report, with the exception of foam capability to the monitors at each breasting platform. Advise when completed.

D.8. SLC staff accepts PRC'S and Eichleay Engineers explanation. Action item complete.

D.9. Action item open.

E. SLC staff accepts PRC'S plan of action. Advise when generator is installed.

F. Action item open.

G. Action item complete.

H. The following information regarding the VRS skid support system is required and will be reviewed by SLC technical staff:

1. Justification and explanation of the 1.0 G lateral force.
2. The calculations and proposed design of the "specialized lateral shear connectors".

Before SLC can consider PRC'S request to be permitted to operate the VRS on a continuing basis, anticipated completion dates for action items D.5, D.6, D.7 and D.9 must be provided for review. Additionally, information requested in Item H. above must be received and reviewed by SLC staff. The primary SLC point of contact for these matters remains Mr. Jim Hart at (310) 499-6400.

Sincerely,

Kevin Mercier
Assistant Division Chief

cc: Charles Warren
J. M. MacDonald, Captain, USCG

bcc: Jane Sekelsky
Mark Meier
Dan Gorfain
Pete Johnson
NCFO

BABET ENGINEERING, INC.

P.O. Box 1878 • Pasadena, Texas 77501
(713) 473-9726 • Fax (713) 475-1752

June 8, 1993

Mr. Robert O. Berkland
Pacific Refining Company
4901 San Pablo Avenue
Hercules, CA 94547

COTP
Att: CDR Scot W. Tiernan
Marine Safety Office
U.S. Coast Guard
Coast Guard Island, Bldg. 14
Alameda, CA 94501

Subject: Marine Vapor Control System for
Pacific Refining Company, Hercules, CA
Certification for Asphalt, Benzene, Naptha, Gasoline, Gasoline Blends, Aviation Gasoline, Jet Fuel, Kerosene, Fuel Oil, Crude Oil, Diesel Oil, MTBE, and Toluene

Dear Sir:

CERTIFICATION

Mr. Richard J. Pichler, Mr. Robert H. Pitch, and myself, Fred H. Babet, have completed a physical examination and testing of all alarm and shutdown systems. This was a recertification of the system conducted as a result of high temperature events (presumed fires) which occurred on March 4, 1992 and November 19, 1992.

According to an investigation conducted by Richlaay Engineers Inc., of California, both fires apparently started on the demister pad in the Lube Oil Separator (V-42). To remedy the problem, the 24 inch diameter Lube Oil Separator was replaced with a 42 inch diameter Lube Oil Separator, without a demister pad, and a high temperature shutdown point (TAHH-40) was installed immediately downstream of the Separator. With the larger diameter separator vessel, a demister pad is not necessary, as the vapor velocity has been decreased by a factor of 3.

Post-it™ brand fax transmittal memo 7671 | # of pages ▸ 5
To Berkland | From Pitch
Co. | Co. Babet
Dept. | Phone # 713 473 9726
Fax # 510 799 8042 | Fax # 713 473 1752

CALENDAR PAGE 205
MINUTE PAGE 2417

Mr. Fitch and I have personally witnessed a 24 hour test run on the system while not collecting any vapors. I have personally witnessed a successful test loading of an inerted marine vessel. Babet Engineering, Inc. is pleased to certify that the facility:

1) Conforms to certified plans and specification's
2) Meets the requirements of the subpart and
3) Is operating properly, under 33 CFR 154.310(b), 33 CFR 154.740(g)-(i), 33 CFR 154.800 to 33 CFR 154.850-subpart Z, 33 CFR 156.120(aa), and 33 CFR 156.170(g)

RESTRICTIONS

1) Materials certified for vapor control: Asphalt, Benzene, Naptha, Gasoline, Gasoline Blends, Aviation Gasoline, Jet Fuel, Kerosene, Fuel Oil, Crude Oil, Diesel Oil, MTBE, and Toluene. Other cargoes are not to be handled unless the system is specifically certified for these materials.

   Each of the above cargoes was reviewed according to Commandant (G-MTH) U.S. Coast Guard's "Facility Vapor Control System (VCS) Requirements for Cargoes other than Crude Oil, Gasoline, and Benzene," dated May 5, 1992.

2) Maximum loading rate: 6,000 barrels per hour.

   The maximum loading rate is based on a demonstrated maximum available loading rate of 6,000 barrels per hour.

3) Inerted vessels: Because only an inerted vessel was tested, vapors can only be controlled from inerted marine vessels, until the system is re-certified for non-inerted vessels.

4) Barge overfill protection: No restrictions. This facility can handle all barges equipped with overfill protection systems under 46 CFR 39.20-9(a), (b), (c), and (d).

   This facility can supply the 120 volt power under 46 CFR 39.20-9(a) and the intrinsically safe system under 46 CFR 39.20-9(b).

   This facility can also handle ships equipped with compatible connectors for overfill protection. If the overfill signal is received from the ship, the cargo loading will be automatically stopped with the dockside valves; at this time, the shoreside cargo pumps must be manually stopped. At the suggestion of the COTP, the

Babet Engineering, Inc. • P.O. Box 1878 • Pasadena, Texas 77501

problem of compatible connectors can be handled by the facility owner and the ship.

EXEMPTIONS

1) There are no exemptions.

Regulation 33 CFR 154.826(a) indicates a detonation, or flame arrestar is required on the inlet and the outlet of a compressor. However, Commandant (G-MTH) has indicated in their reply of January 6, 1992, that the entire compressor/refrigeration section is considered to be one unit and a detonation arrester would be required on the exit from the unit. Pacific Refining has complied with this requirement and has installed detonation arrestars on the inlet and outlet of the refrigeration unit.

TESTS CONDUCTED

1) Because this was a recertification, a complete set of tests was not conducted. The following tests were conducted as part of the normal pre-transfer checks:

a) High pressure alarm functions +0.9 psig (PAH-1)
2) Low pressure alarm functions +0.2 psig (PAL-1)
3) High high pressure shutdown functions +1.3 psig (PAHH-1)
4) Low low pressure shutdown functions +0.05 psig (PALL-1)
5) Compressor suction scrubber (knockout vessel) high level shutdown (LAHH-31).
6) Audible alarm functions
7) Visible alarm functions

PLANS REVIEWED

1) A list of all plans that were reviewed by the certifying entity are enclosed.

AUTHORITY

1) Babet Engineering is a U.S. Coast Guard Certifying Entity as authorized by a letter from Commandant (G-MTH) dated August 10, 1990.

Babet Engineering Inc. • P.O. Box 1878 • Pasadena, Texas 77501

If there are any questions, please feel free to call us.

Sincerely,

Fred H. Babet, P.E.

CC: John M. Sakamoto, P.E.
Eichleay Engineers Inc.
Suite 600
1390 Willow Pass Road
Concord, CA 94520

Enclosures:
1) Facility description listing major equipment items
2) List of references and plans used by certifying entity dated May 25, 1993

Babet Engineering, Inc. • P.O. Box 1878 • Pasadena, Texas 77501

ATTACHMENT

For U.S. Coast Guard annual inspection, the following major equipment list is enclosed.

The vapor control system has the following major equipment (starting from the waterside dock edge).
Note: The first 11 items are on both the ship and barge side of the dock. After that, the lines converge for further processing.

1) Stud hole in flange of vapor connection
2) Insulating flange
3) Approved (marked) vapor hose with support saddles
4) Marked facility vapor connection piping
5) Manual vapor shutoff valve
6) Pressure/vacuum gauge
7) Pressure/vacuum connection leading to pressure/vacuum sensors - 2 pressure and 2 vacuum for alarm and shutdown conditions (total of 4 sensors)
8) Pressure/vacuum control sensor
9) Remotely operated vapor control valve with valve position indicator and manual operator
10) Detonation arrester with low point drain (DA-1, DA-2)
11) Manual vapor shutoff valve
12) Detonation arrester for inlet to compressor, equipped with low point drain (DA-3)
13) Recycle line with vacuum relief valve
14) Knock out (KO) vessel for inlet-to-compressor; equipped with automatic drain, sight glass, high level alarm sensor, and high high level shutdown sensor (V-31)
15) Pressure/vacuum relief valve
16) Compressor with temperature and pressure sensors (C-40)
17) Compressor oil/vapor separator with high temperature shutdown (V-42) and lube oil cooler system (E-41)
18) Sea water cooled, KO heat exchanger (E-3) and separator (V-7)
19) Economizer heat exchanger (E-5)
20) Gasoline condenser (E-6), cold separator (V-7), and condensed gasoline return line
21) Residual gasoline vapor absorber tower (T-8) and gasoline-free vapor vent
22) Detonation arrestar on gasoline-free vapor vent (FA-1)
23) Sponge oil (lean absorber fluid) fluid cooler (E-9)
24) Rich sponge oil economizer/preheater exchanger (E-10, E-12)
25) Lean sponge oil cooler (E-11)
26) Sponge oil circulation pumps (P-13, P-14)
27) Sponge oil stripper/distillation column (T-15) residual gasoline vapor to gas recycle line
28) Propane refrigerant system (V-18, E-17, C-27, V-34, E-20)
29) Other auxiliary equipment for sea water cooling water (P-21, P-22); methanol antifreeze injection (V-36, P-23, P-24); and instrument air compressor (C-45)

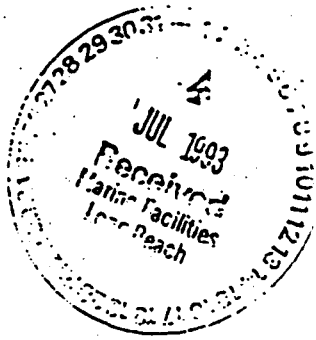
Baker Engineering, Inc. • P.O. Box 1878 • Pasadena, Texas 77501

W 7777.14

PACIFIC REFINING COMPANY

A Joint Venture of Sinochem and The Coastal Corporation Subsidiaries

June 29, 1993



Kevin Mercier
Assistant Division Chief
State Lands Commission
330 Golden Shore, Suite 210
Long Beach Calif., 90802-4246

Proof of Safety and Condition of Vapor Recovery System (VRS) at Hercules Terminal

Dear Mr. Mercier

In response to your letter dated June 3, 1993 the following is an update on Pacific's progress toward recertification and safety enhancements to the Marine Vapor Recovery System.

D.3. As of June 26, Pacific has two (2) four (4) man inflatable rafts on the wharf for emergency evacuation purposes.

D.5. Pacific is not in agreement with SLC for the need to install remote start capability for the fire pump at all the fire water monitors and hydrants. The installation of this type of system requires numerous relays so that each switch acts independently of the others. This type of system will require high maintenance to ensure proper operations at all times. As Pacific has indicated in previous letters, we currently have remote start capability at the Wharf Technician shed and at the pump. Too improve upon this capability we propose to install another start/stop switch at the monitors between the MVRS and the pump. Pacific believes that three remote start/stop switches should be adequate.

D.6. Pacific agrees to install the water deluge system with that will be automatically activated with fusible plug heat detectors located in the VRS skid. Installation of this system is scheduled for completion is late September.

D.7. As of this date Pacific has installed additional fire hoses on the wharf. Pacific will also install an additional drum of foam and an inductor for foam application via the hose. The additional drum of foam and inductor will be available by July 15.

D.9. Pacific presently has a wharf "common trouble alarm" which activates when the fire pump is on and/or the diesel

P. O. BOX 68
HERCULES, CA 94547
(415) 799-8000
FAX (415) 799-8042

generator is running. There is also a sump pump running alarm. The alarms are routed to the Control Room where they are monitored 24 hours a day.

E. The generator has been ordered from the vendor. We have been advised that delivery will be in late July with installation in August.

H. The requested information will be provided to your staff the week of July 5, 1993.

Should you have any additional questions please contact me at (510) 7998150.

Sincerely,

Ralph Edwards

Director, Environmental and External Affairs

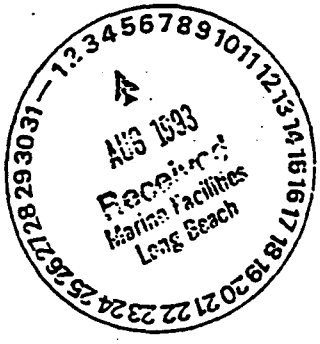
cc: Paul Miller
Judy Moore
John Sakamoto Eichleay
Paul Fager
Myles Butler

W 11111T

PACIFIC REFINING COMPANY
A Joint Venture of Sinochem and The Coastal Corporation Subsidiaries

P.O. BOX 88
4901 SAN PABLO AVENUE
HERCULES, CALIFORNIA 94547

(510) 799-800
FAX (510) 799-8042



July 30, 1993

Jim Hart
State Lands Commission
Marine Facilities
330 Golden Shore, Suite 210
Long Beach, CA 90802-4246

Subject: Pacific Refining Company - Vapor Recovery System

Dear Mr. Hart:

Attached for your review is the information requested in Item H. of Kevin Mercier's letter regarding the adequacy of the Marine Vapor Recovery Unit. I regret not getting this information to you sooner; however, it was my understanding that our contractor, Gayle Johnson of EQE, had provided this data directly to State Lands.

Should you have any questions, please advise.

Sincerely,

Ralph Edwards
Director, Environmental and External Affairs

RJE:qew

cc: Chris McDowell
Judy Moore
James Sakamoto

CALENDAR PAGE	212
MINUTE PAGE	2424

EXHIBIT D - 9

SEISMIC ADEQUACY OF THE VAPOR RECOVERY UNIT

The following issues have been raised regarding the seismic adequacy of Pacific Refining Company's Marine Vapor Recovery Unit. These concerns have been raised by State Lands Commission technical staff through letters, meetings, and telephone conversations with EQE technical staff. Discussion of each of these issues follows.

Design Issues

1. *Appropriateness of use of Uniform Building Code for design loads.*
2. *Ground motion level may be too low.*
3. *Structural design of Vessel T-8 and support skirt.*
4. *Structural design of Vessel T-15 and support skirt.*
5. *Appropriate factor of safety considering fire/explosion/pollution hazard.*
6. *Consideration of boat impact load on skid design.*

Installation Issues

7. *Installation of VRU skid anchorage.*
8. *Cutout in skirt of Lube Oil Separator Vessel*
9. *Missing bolt in VRU support frame.*

DISCUSSION OF ISSUES RAISED BY STATE LANDS COMMISSION

The following is our interpretation of each of State Land's stated concerns, our comments or findings, and where appropriate, our recommendations.

DESIGN ISSUES

Issue 1: Appropriateness of UBC for design loads.

State Land's Position/Concern:

The Uniform Building Code is inappropriate to use for the structural design of the Vapor Recovery Unit because it is mounted on a pile-supported structure in water. A more appropriate code would be API RP 2A, which is commonly used for design of fixed offshore platforms. The vapor recovery unit should be checked for conformance with RP 2A.

EQE Comments:

The vapor recovery unit skid connections were designed to the Uniform Building Code (UBC). Vessel and skirt designs followed ASME Section VIII, Division 3, Boiler and Pressure Vessel Code, using a UBC approach for seismic load definition. Following discussions with several wharf designers and owners, we understand that there is no "commonly accepted" or "typical" design code used for the seismic design of equipment on a wharf.

While the UBC specifically addresses "nonbuilding structures" and would certainly address the design of the vapor recovery unit if it were onshore, it does not clearly address all relevant considerations of the seismic design of a unit located on a flexible structure in water. While the basic approach may be appropriate (static loads, ductility factors), not all parameters and values may be appropriate. For example, for a new design of equipment anchorage on a flexible structure such as the wharf, we would recommend that the acceleration input for the equipment be the response of the deck of the wharf, not the ground response.

It is doubtful that all parts of the design of the vapor recovery unit would satisfy the current requirements of API RP 2A. Specifically, RP 2A does not allow a load reduction for factors such as system ductility. However, it should be noted that prior to being addressed in RP 2A, the design of topsides equipment was performed according to the standards of each company, often using a static load approach with a reduction factor for ductility.

CALENDAR PAGE	214
MINUTE PAGE	2426

Except for certain aspects of the skid/deck connection discussed in Issue 7 below, we believe the as-installed condition of the vapor recovery unit should be considered as seismically adequate regardless of code conformance, based on the following considerations:

- EQE, PRC, and State Lands have inspected the condition of the vapor recovery unit. Equipment is adequately tied to the skid. Piping appears to have sufficient flexibility to withstand differential motions and does not contain features that have proven to be seismically vulnerable in past earthquakes.

- Tall vessels were governed by wind loads rather than the UBC seismic loads (with margins of 2.5 to 3), would be expected to exhibit ductile behavior, and would be considered as a low hazard of catastrophic failure.

- Other mechanical equipment on the skid (e.g. valves, compressors) would be expected to exhibit rugged behavior and withstand large earthquakes without damage.

EQE Recommendation:

As discussed in Issue 7 below, we have recommended strengthening of the anchorage of the VRU skid to the wharf deck, as the existing connection is inadequate for the seismic loads used in the skid design. We believe that API RP 2A can be reasonably used for the modification design with only minor cost impact. We recommend that no other modifications be performed solely to conform with API RP 2A.

Issue 2: Ground motion used in design may be too low.

State Land's Position/Concern:

Recent work commissioned by Caltrans for area bridges has indicated a higher level of seismic hazard than was used in the design of the VRU. This higher level of ground motion should be considered.

EQE Comments:

Whether designed according to the UBC or API RP 2A, seismic loads are dependent on an engineering representation of the site dependent earthquake ground motion. The as-installed design of the VRU uses the UBC term "Z" in the base shear equation to represent motion having a 10 percent probability of exceedance in 50 years (equivalent to approximately a 475 year return period).

The values and spectral shapes shown in the UBC are subject to change as more records and knowledge are accumulated.

API RP 2A uses a 200 year return period earthquake with standard shapes and acceleration values given for offshore regions in the U.S.

Special studies are often performed for critical structures such as nuclear plants or highway bridges, or where the owner requests site-specific data to evaluate risk or to design to a higher standard because of economic importance of a facility. However, standardized values such as those in the UBC are regularly used as a minimum design basis to ensure life-safety for structures in California. The use of any higher values for an installation such as a vapor recovery unit should be at the discretion of the owner.

EQE Recommendation:

No action.

Issues 3 and 4: Structural design of Vessels T-8 and T-15 and their support skirts.

State Land's Position/Concern:

Vessels T-8 and T-15 were designed using methods other than the 1991 UBC. Because the vessel sits on another structure, it will see amplified response. Their designs may not be appropriate.

EQE Comments:

The vessels have been designed using ASME Section VIII, Division 3, Boiler and Pressure Vessel Code. This is the standard code used for design of pressure vessels in petrochemical facilities. The vessel check for seismic loads combines pressure, dead weight, and seismic moments. A similar method is used for wind loads. Low values of allowable stress are utilized, 15 ksi for steel. The methodology used for load distribution is consistent with the UBC.

The skirt also is designed using a UBC approach. The calculations use the 1985 UBC, with a base shear equation slightly different than the one used in the 1988 and 1991 UBC. However, the base shear will be approximately the same as that obtained using the current UBC, assuming an Rw of 4. appropriate for this type of vessel.

We would expect ductile behavior from these vessels and skirts without a high risk of catastrophic failure. Vertical pressure vessels have not been observed to collapse in past earthquakes due to inertial loads. The skirts for T-8 and T-15 do not have a potential "soft story" effect, where the thickness of the skirt is

much lower than the thickness of the vessel, raising the potential for all deformation to take place at one location. It should also be noted that the bottom of the vessel and the skirt are governed by wind loads, with the loads being approximately 2.5 - 3 times that of the seismic loads, giving additional safety margins.

Attached piping appears to have adequate flexibility to withstand the displacements that would be expected and would be able to accommodate minor levels of inelastic deformation.

EQE Recommendation:

No action.

Issue 5: Extra factor of safety for fire/explosion/pollution.

State Land's Position/Concern:

A larger factor of safety may be appropriate to account for fire/explosion/pollution concerns.

EQE Comments:

The UBC design approach uses an importance factor to add safety for critical facilities, essential facilities, and hazardous facilities. A value of 1.0 is typically used for the importance factor in the design of petrochemical facilities, unless failure of the equipment would result in potential hazardous releases to the general public.

We understand from conversations with Primatech that some products containing H_2S are handled by the wharf, and that these materials may be considered to be Acutely Hazardous Materials under California regulations. However, the vapor recovery unit would be unlikely to be required to handle those particular products. Furthermore, flammable gases and propane pose a safety hazard on the dock alone and not a threat to the public on shore or in the waterways surrounding the wharf.

We also understand from Primatech that oil spills resulting from catastrophic events such as breaks in the pipelines have been addressed in the Oil Spill Response Plan, for OPA-90.

EQE Recommendation:

No action.

Issue 6: Consideration of boat impact load on design

State Land's Position/Concern:

Accelerations on the VRU skid from boat impact may be larger than those experienced during an earthquake. These should be checked.

EQE Comments:

PRC and their contractors have not been able to locate original calculations for the boat impact loads on the wharf (PRC was not the original wharf owner). It should be noted that any major boat impact would be expected to occur when the VRU is not in operation, thereby posing no safety hazard. It is assumed that any damage to the VRU would be obvious before starting up the unit, and would only occur due to large displacements which could occur in conjunction with damage to skid or equipment anchorage.

EQE Recommendation:

We would recommend that Pacific Refining Company review procedures to ensure that in the event of a large boat impact, the vapor recovery unit skid is visually reviewed before start-up of the unit to ensure that no damage to anchorage has occurred that allows movement of the skid.

We would also recommend that PRC review HAZOPS and other system reviews to ensure that non-structural effects which could occur in a boat impact or earthquake, such as loss of power or tripping of relays, would not result in a fire, explosion, or pollution hazard.

Issue 7: Installation of VRU skid anchorage

State Land's Position/Concern:

During the September 1992 inspection, several problems were observed in the as-installed condition of the anchorage, including the following:

- Slotted holes were used for the bolts, often with no washers, rendering bolts ineffective to resist loads in all but one direction.
- Bottom plates on the bolts were loose, in many cases able to be spun by hand.
- The concrete curb was spalled around several of the anchor bolts.

CALENDAR PAGE	218
MINUTE PAGE	2430

- The skid was not aligned with the curb, raising the possibility of shifting of the skid a small amount.

EQE Comments:

We observed the same conditions and agree with nearly all of State Lands' observations. It was reported that when the flange to a compressor was disconnected for service, the pipe did not move in the direction of potential misalignment, indicating that the skid has not shifted since installation.

Several modifications have been installed. All existing bolts have been tightened, with double nuts, and washers welded to the skid. The grout has been repaired, although this is a cosmetic repair only.

We have noted that the lack of confinement in the anchor bolts (where the spalling of the curb had already occurred) leads to severe overstress due to bending of the bolts on the side of the skid with the 6" curb. This condition exists even under lower loading levels than the original design.

EQE Recommendation:

Because of the low capacity due to lack of confinement of anchor bolts through the curb, modifications to the skid anchorage are required. We have recommended several conceptual retrofit schemes, which we have transmitted to Bechtel Engineers for final design.

For the modification, we have recommended that higher loading levels be used than in the original design. We believe that sufficient conservatism can be added to address any concerns of State Lands with minimal additional retrofit costs.

A lateral acceleration of 1.0g has been proposed to State Lands as a conservative design for the VRU skid anchorage. This is consistent with API RP 2A, as requested by State Lands, and is conservative with regards to the UBC.

API RP 2A would require a 200 year earthquake, with a peak response of 0.25g (Zone 4, California) times 2.5 (for amplified peak response). A value of 0.4g (Zone 5, Alaska) times 2.5 would be more appropriate, considering that the zones in RP 2A cover only areas offshore, away from California's major fault systems, such as the San Andreas and Hayward fault zones.

The 1.0g factor also corresponds to a UBC Zone 4 peak response (0.4g times 2.5), with no reduction factor for ductility. The load would be assumed to act nonconcurrently in the direction of each principal axis, consistent with UBC Section 2334 (a).

Issue 8: Cutout in skirt of Lube Oil Separator Vessel

State Land's Position/Concern:

The skirt of the Lube Oil Separator Vessel contains an unreinforced pipe penetration that is of large diameter relative to the diameter of the skirt. This will significantly reduce the structural capacity of this skirt support.

EQE Comments:

We noted the same concern during the walkdown and concur with State Lands on this issue. This vessel has since been taken out of service, and has been replaced with a larger diameter skirt, without cutouts.

EQE Recommendation:

No further action.

Issue 9: Missing bolt in VRU support frame

State Land's Position/Concern:

State Lands identified a missing bolt in the VRU support frame during the September 1992 walkdown.

EQE Comments:

We have identified that the missing bolt is from a connection for one of the top beams that is temporary installed for transportation and is not required for permanent installation of the VRU. The member has since been removed completely from the skid.

EQE Recommendation:

No further action.

CALCULATION COVER SHEET

JOB NO. 4514 DISCIPLINE CIVIL/STRUCTURAL NO. of SHEETS 6

TITLE

PACIFIC REFINERY CO.
HERCULES, CA

SUBJECT

ANCHORAGE OF EXISTING VRU SKID

DESIGN CRITERIA

1991 UBC

SOURCES of FORMULA & REFERENCES

1991 UBC

PRELIMINARY CALC. _____ FINAL CALC. ✓

REV.	DATE	CALCULATION BY	CHECKED BY	DATE	APPROVED BY
0	5-24-93	R SITJAR			

CALENDAR PAGE 221
MINUTE PAGE 2433

PROJECT PACIFIC REF. CO CONTRACT 4514 CLIENT REF.
SUBJECT ANCHORAGE OF (E) VRU SKID DESIGNED DATE 5-21-93
CHECKED DATE

1.0 DESIGN CRITERIA

MATERIALS

STEEL - A36

CONC. ASSUMED $f_c' = 2500$ psi

BOLTS - A325 U.N.O (THREADED ROD)

DESIGN LOADS

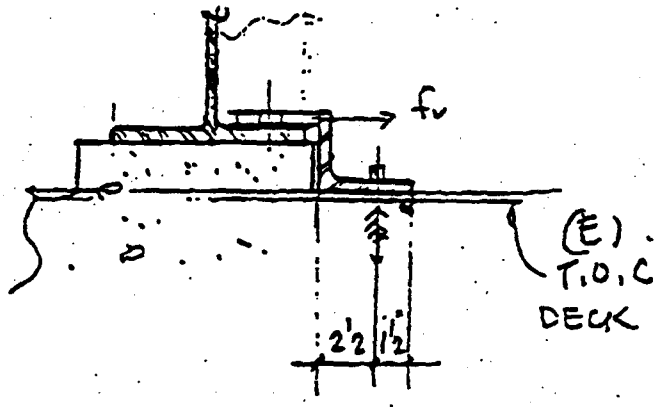
MAX. LATERAL LOADS = 136.0 Kips (19)

ASSUMED LATERAL LOADS ARE DISTRIBUTED EQUALLY BETWEEN SHEAR ANCHORS,

2.0 DESIGN OF ANCHORS

a. TRY 5 - EQUAL ANCHORS

$F_A = 136/5 =$ 27.2 K SHEAR PER SHEAR ANCHOR



TRY 4-BOLT PER ANCHOR

SHEAR/BOLT

$f_v = 27.2/4 =$ 6.8 K/BOLT.

TENSION/BOLT.

$f_t = f_v \times 2.75 / 1.5 \times 0.875$

$= 14.25$ K/BOLTS.

THREADED ROD

1"ϕ X 8'4" MIN. EMBED

WITH HILTI-HIT-C-100 ADHESIVE

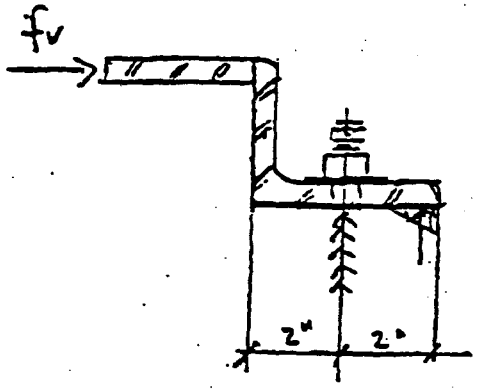
COMBINED FORCES

$\Sigma f/_G = \frac{6.8}{6.8} + \frac{14.25}{5.72} = 1 + 2.49 = 3.49 >> 1.33$ N.G.

CALENDAR PAGE	222
MINUTE PAGE	2434

PROJECT PACIFIC F.E. Co. HOLLISTER Co. CONTRACT 4514 CLIENT REF.
SUBJECT ANCHORAGE OF (E) VRU SKID DESIGNED DATE 5-21-93
CHECKED DATE

b). REVISED BOLT LOCATION AND ADHESIVE TYPE:



$f_v = 6.8^K/\text{BOLTS}$

$f_t = 6.8 \times 2.25/2 \times 0.875$
$= 10.68\ ^K/\text{BOLTS}.$

TRY A325 THREADED ROD 1"ϕ × 8 1/4 MIN. EMBEDMENT
HILTI-HVA ADHESIVE ANCHORS HEA RESINS
MIN. SPACING OF 8 1/4" O.C. < 8 1/2" O.C. PROVIDED
$f'_c = 2500$ psi

FULL CAPACITY SHEAR $B_v = 13330\ \#/\text{BOLTS}$

TENSION $B_t = (15420+13560)/2 = 14490\ \#$

COMBINED FORCES.

$$\Sigma f/B = \frac{6.8}{13.33} + \frac{10.68}{14.49} = 0.51 + 0.74 = 1.25 < 1.33$$
OK

BEARING ON CONCRETE

$P_c = 10680\ \#$ $\quad f_c = \dfrac{2 \times 10680}{8.5 \times 0.25 \times 3} = 3350$ psi $> 0.7 f'_c \times 1.33 = 0.93 f'_c = 232$

$f_c = \dfrac{10680 \times 1.7 \times 1.1 \times 0.75}{8.5 \times 0.248 \times 2} = 3552$ psi $>$ $0.7 f'_c$

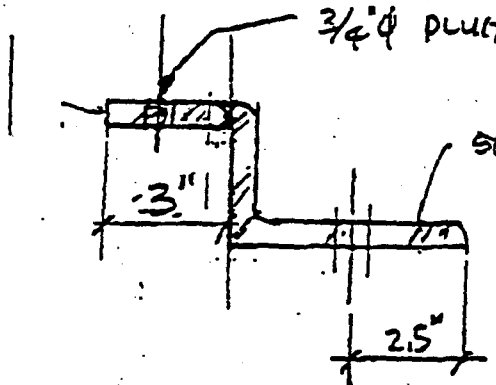
CHANGE $d = 2.375$

$f_c = 2 \times 8998/8.5 \times 0.247 \times 3 = 2376$ psi $> 0.7 f'_c$

CALENDAR PAGE 223
MINUTE PAGE 2435

PROJECT ROLPH REF. HERCULES CO. CONTRACT 4514 CLIENT REF.
SUBJECT ANCHORAGE OF (8) VRU SKID DESIGNED DATE 5/21-93
CHECKED DATE

b) d. CHANGE ∠ to 3X5X1/2



$f_t = 6.8 \times 2.75 / 2.5 \times .875 = 8.55^K$

$f_c = 2 \times 8550 / 8.5 \times 0.3125 \times 3 = 2146 psi$

$< 0.93 f_c'$ OK

TRY PLUG WELD 13/4"ϕ

$f_w = 0.44 \times 0.707 \times 21 = 6.5^K$/HOLE. $\times 1.33 = 8.7^K$

6 PLUG WELD $= 6.5 \times 6 = 39^K > 27.2 \times 0.75 = 20.4^K$

CALENDAR PAGE	224
MINUTE PAGE	2436

John Sakamoto	
Co.	Co.
Dept.	Phone #
Fax # 510-689-7006	Fax #

To: John Sakamoto

From: Gayle Johnson

Date: May 14, 1993

SHT. 4

John,

After returning to the office, I discussed several potential methods of anchoring the VRU skid with Tony Hitchings. He has sketched up four possible schemes. All should work, and it is more a matter of ease of installation and preference. They are, by the way, simpler than what I discussed with you.

Scheme A: Clips in 5 locations on the inboard side, with 3 studs in each clip. This could go on the inside or outside of the curb, and if outside, could be grouted over to prevent tripping hazards.

Scheme B: Similar to Scheme A, except it does not take all of the shear out on one side. Although the numbers work for clips on one side, it may be preferable to include brackets at the larger curb side also.

Scheme C: Create shear keys by filling in open sections of the skid with reinforced concrete. Drill dowels into the existing deck to tie the shear keys to the deck.

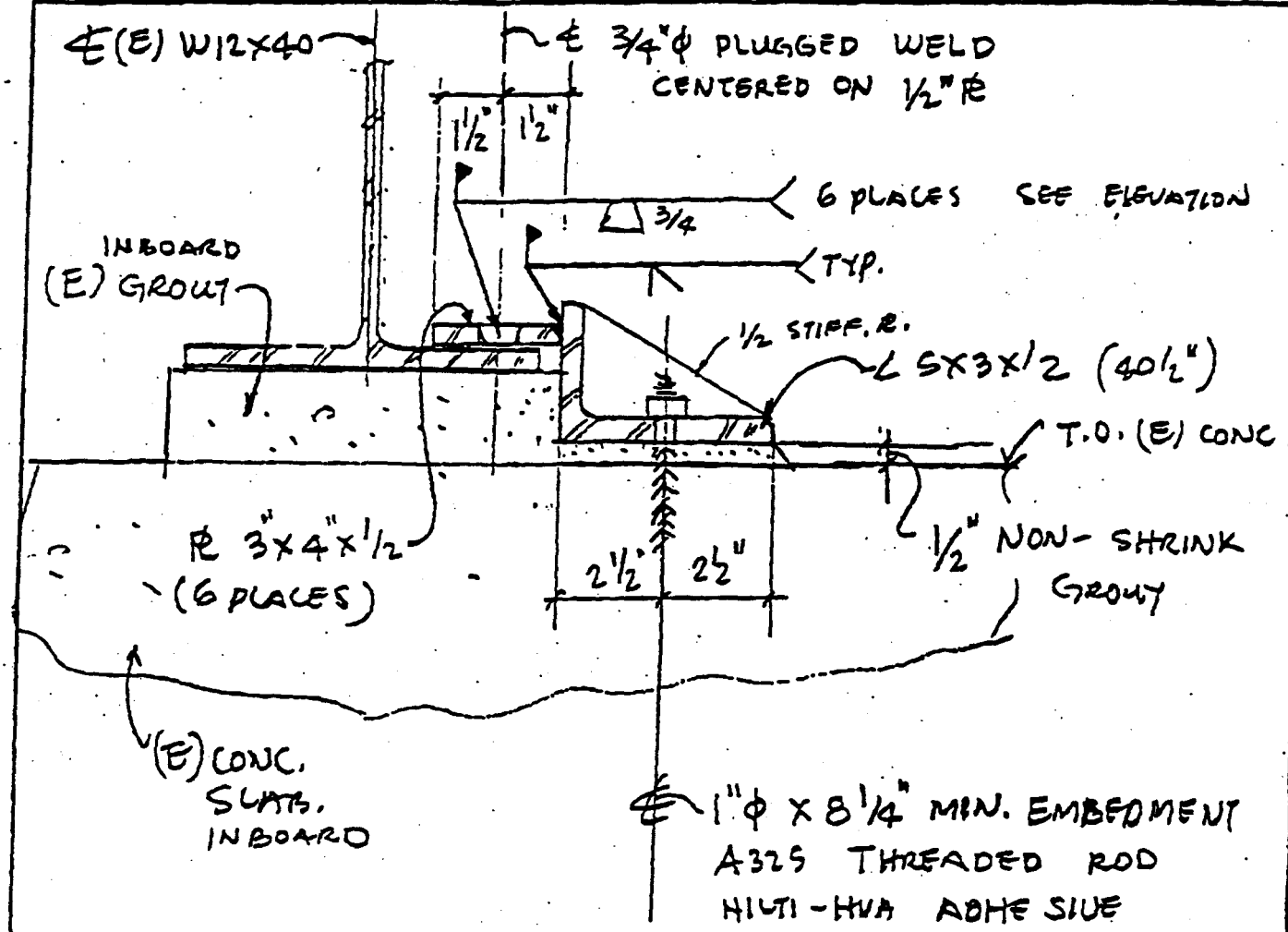
Scheme D: A bolted base plate with attached steel acting as a shear key, again installed in open sections of the skid.

You can call Tony Hitchings at (415) 989-2000 if you have any questions. We are assuming a 1.0g load (136 kips total). We also assume the existing configuration is adequate to resist any overturning. I will try to call State Lands Commission on Monday to confirm their acceptance of the loads.

V = 136 kips => 1/3 ...

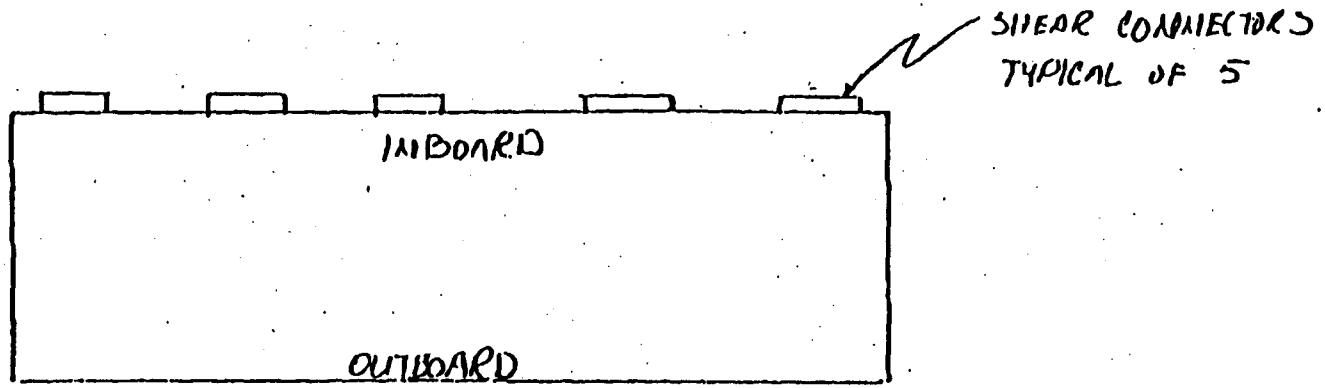
CALENDAR PAGE	225
MINUTE PAGE	2437

PROJECT PACIFIC REF. CO. HERCULES. CO. CONTRACT . 9514 CLIENT REF.
SUBJECT ANCHORAGE OF (E) VRU SKID DESIGNED DATE 5/21/93
CHECKED DATE

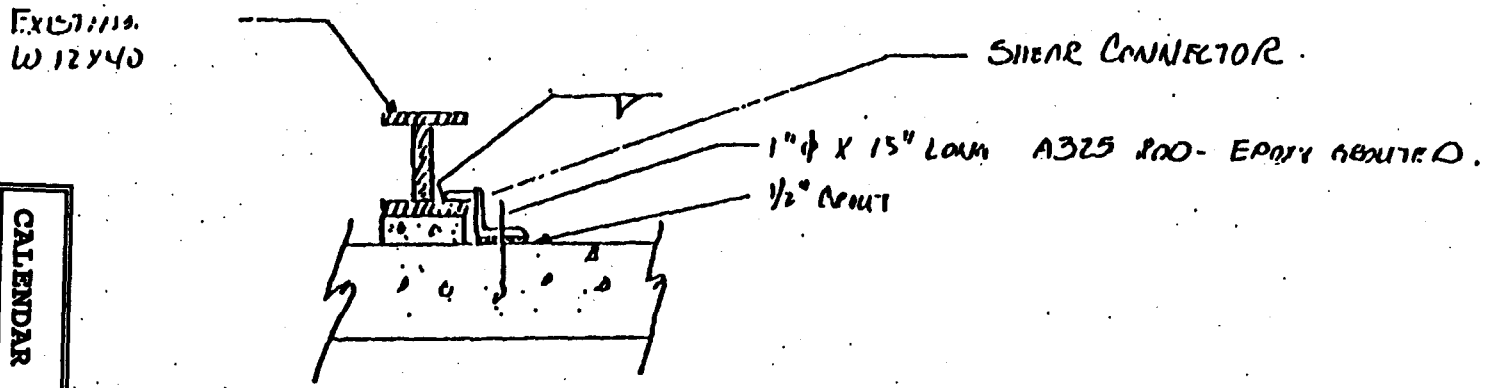


ANCHOR DETAIL 1

CALENDAR PAGE	226
MINUTE PAGE	2438



KEY PLAN
(NO SCALE)



SECTION @ SHEAR CONNECTOR

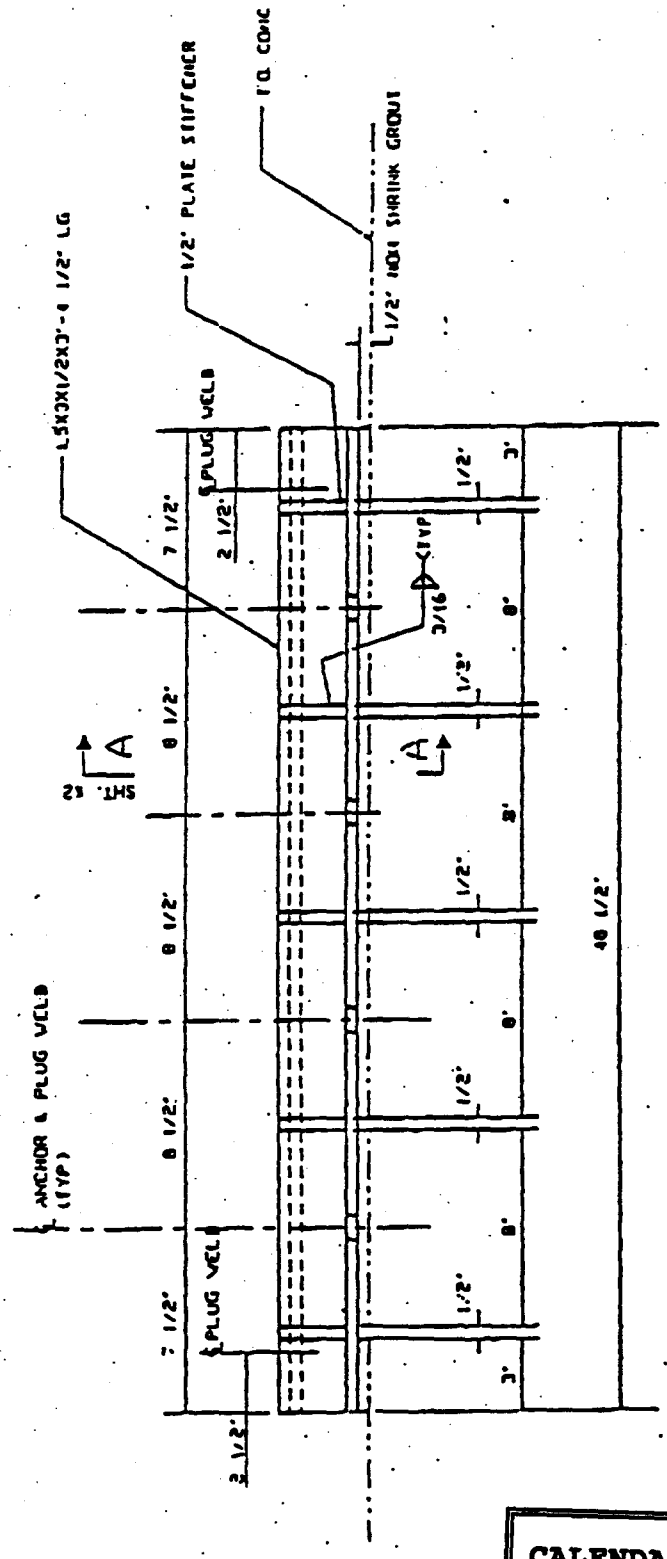
SHEAR CONNECTOR
INSTALLATION PLAN
MVR SKID
PACIFIC RETAINING.

CALENDAR PAGE 227
MINUTE PAGE 2439

PROJECT PACIFIC REFINING CO — CONTRACT No. — CLIENT REF.

SUBJECT MVR SKID ANCHORAGE SHEAR CONNECTOR — DESIGNED — DATE 5-21-93

CHECKED — DATE



ELEVATION

SHEAR CONNECTOR

(5 REQUIRED)

CALENDAR PAGE	228
MINUTE PAGE	2440

PROJECT PACIFIC REFINING Co — CONTRACT No. — CLIENT REF.

SUBJECT MVR SKID ANCHORAGE SHEAR CONNECTOR — DESIGNED — DATE 5-21-93

CHECKED — DATE

SECTION A

ANCHOR DETAIL

CALENDAR PAGE	229
MINUTE PAGE	2441

STATE OF CALIFORNIA PETE WILSON, Governor

STATE LANDS COMMISSION
MARINE FACILITIES INSPECTION
AND MANAGEMENT DIVISION
330 Golden Shore, Suite 210
Long Beach, California 90802-4246
(310) 499-6312
TDD/CRS 1-800-735-2929
FAX (310) 499-6317

June 3, 1993
W 9777.14

Ralph J. Edwards
Director, Environmental and
External Affairs
Pacific Refining Company
P. O. Box 68
Hercules, CA 94547

Dear Mr. Edwards:

Subject: **Proof of Safety and Condition of Vapor Recovery System (VRS) at Hercules Terminal**

This letter is in response to Pacific Refining Company's (PRC) letter of May 26, 1993, and PRC'S consulting engineers, Eichleay Engineers Inc., referenced letter of May 25, 1993. As discussed in the telephone conversation between you and me on May 28, PRC has permission to hot test the VRS provided the "dry runs" are completed satisfactorily by the USCG approved third party certifying entity. Please keep the SLC Vallejo field office informed of the schedule for these tests, as they will witness them as operations allow. The following action items are considered either complete or require continuing action by PRC (the numbers used are per all previous correspondence on this subject):

B. **Removal of Flame Arrester, FA-51**
SLC staff accepts PRC'S plan of action. Action item complete.

C. **High/Low Level Alarm and High Shutdown for Wharf Sump**
SLC staff accepts PRC'S explanation and plan of action. Action item complete.

D. **PrimaTech Recommended Improvements to the Wharf Fire and Safety Provisions**

D.2. SLC staff accepts PRC'S explanation. Action item complete.

CALENDAR PAGE	230
MINUTE PAGE	2442

EXHIBIT D - 10

D.3. Action item open.

D.4. SLC staff accepts PRC'S consulting engineers, Eichleay Engineers, plan of action. Action item complete.

D.5. SLC staff requires remote start capability for the fire pump at all the fire water monitors and hydrants. Advise when completed.

D.6. SLC staff agrees with PRC installing a water deluge system for the VCS skid, but SLC requires that the deluge system, at a minimum, be automatically activated with fusible plug heat detectors located in the VRS skid. The fusible detection system shall automatically activate the fire pump, shutdown the VRS, and alarm the refinery control room. Since PRC intends to have only one Wharf Tech dedicated to transfers on the wharf, and the Wharf Tech "could be attending to activities aboard the vessel," this automatic system will provide the best available protection. Advise when completed. SLC Staff agrees with Eichleay Engineers relocation of the west fire monitor from the west edge of the main loading platform to the catwalk. Advise when completed.

D.7. SLC staff agrees with Eichleay Engineers providing foam capability to the two monitors nearest the main platform. SLC requires PRC to implement, as a minimum, all the other items as detailed in recommendation #10 on P. 19 of the PrimaTech Report, with the exception of foam capability to the monitors at each breasting platform. Advise when completed.

D.8. SLC staff accepts PRC'S and Eichleay Engineers explanation. Action item complete.

D.9. Action item open.

E. SLC staff accepts PRC'S plan of action. Advise when generator is installed.

F. Action item open.

G. Action item complete.

H. The following information regarding the VRS skid support system is required and will be reviewed by SLC technical staff:

1. Justification and explanation of the 1.0 G lateral force.
2. The calculations and proposed design of the "specialized lateral shear connectors".

Before SLC can consider PRC'S request to be permitted to operate the VRS on a continuing basis, anticipated completion dates for action items D.5, D.6, D.7 and D.9 must be provided for review. Additionally, information requested in Item H. above must be received and reviewed by SLC staff. The primary SLC point of contact for these matters remains Mr. Jim Hart at (310) 499-6400.

Sincerely,

Kevin Mercier
Assistant Division Chief

cc: Charles Warren
J. M. MacDonald, Captain, USCG

CALENDAR PAGE	232
MINUTE PAGE	2444

bcc: Jane Sekelsky
Mark Meier
Dan Gorfain
Pete Johnson
NCFO

PACIFIC REFINING COMPANY

A Joint Venture of Sinochem and The Coastal Corporation Subsidiaries

August 5, 1993

AUG 1993 Received Marine Facilities Long Beach

Kevin Mercier
Assistant Division Chief
State Lands Commission
330 Golden Shore, Suite 210
Long Beach, Calif. 90802-4246

Pacific Refining Company - Vapor recovery System

Dear Mr. Mercier

The following is an update to Pacific activities concerning its Marine Vapor Recovery System.

D.3. Two (2) inflatable boats are now in place on the wharf. This action completes this requirement.

D.5. As noted in a previous memo, Pacific believes that the two (2) remote start points on opposite ends of the wharf provides sufficient capability for starting the fire pump. The existing remote start switches are within very close proximity of the fire water monitors.

D.6. Pacific schedule still calls for the installation of the fusible plug heat detector system tied into the water deluge system to be installed in late August/early September. We will advise you prior to starting construction.

D.7. Pacific prefers not to install additional hose and or a continuous flow hose reel because we believe it will be ineffective. All areas where a fire could start are sufficiently cover by a monitor. In addition, these monitors have foam fighting capability. All other items in recommendation No. 10 on page 19 of PrimaTech Report have been implemented.

D.9. A trouble alarm has been installed. The alarm activates when the fire pump starts, the generator is on, and when the sump pump is running.

F. Pacific has designate specific individuals as Qualified for training on the VRS and Wharf duties.

Should you require any additional information please contact me.

CALENDAR PAGE	234
MINUTE PAGE	2446

P. O. BOX 68
HERCULES, CA 94547
(415) 799-8000
FAX (415) 799-8042

Sincerely,

Ralph Edwards

Director, Environmental and External Affairs

cc: Chris McDowell
John Sakamoto
Myles Butler

CALENDAR PAGE	235
MINUTE PAGE	2447

STATE OF CALIFORNIA PETE WILSON, Governor

STATE LANDS COMMISSION
MARINE FACILITIES INSPECTION
AND MANAGEMENT DIVISION
330 Golden Shore, Suite 210
Long Beach, California 90802-4246
(310) 499-6312
TDD/CRS 1-800-735-2929
FAX (310) 499-6317

August 12, 1993
W 9777.14

Ralph J. Edwards
Director, Environmental and
External Affairs
Pacific Refining Company
P. O. Box 68
Hercules, CA 94547

Dear Mr. Edwards:

Subject: **Proof of Safety and Condition of Vapor Recovery System (VRS) at Hercules Terminal**

This letter is in response to Pacific Refining Company's (PRC) letters of June 29, July 30, and August 5, 1993. There are action items that PRC satisfactorily addressed in the June letter, but which PRC stated an opposite plan of action in the August 5 letter. Specifically these items are D.5 and D.7. The following paragraphs update the previous status of action items, and describe the requirements PRC must complete before this Division can recommend authorizing sustained VRS operations to our Land Management Division.

D. **PrimaTech Recommended Improvements to the Wharf Fire and Safety Provisions**

D.3. Action item complete.

D.5. SLC staff requires remote start capability for the fire pump as described under D.5. of your June 29, 1993, letter, "Too improve upon this capability we propose to install another start/stop switch at the monitors between the MVRS and the pump. Pacific believes that three remote start/stop switches should be adequate." Advise when completed.

D.6. Advise when the fusible plug heat detectors, which would automatically activate the VRS skid deluge system, are installed and the deluge system functions as designed.

D.7. SLC staff requires PRC to install hard non-collapsible hose on a continuous flow type hose reel provided with foam availability, permitting application of either AFFF or fire water, as described in the PrimaTech Report and verified by Mr. D. L. Blomquist, Registered Fire Protection Engineer, of Eichleay Engineers. Moreover, PRC indicated in their June 29, 1993, letter that the non-collapsible hose with foam capability would be installed.

Since PRC intends to have only one Wharf Tech dedicated to transfers on the wharf, this type of equipment enables quick response by a single person with reliable protection on incipient stage fires. Advise when completed.

D.9. SLC staff accepts PRC'S explanation and plan of action. Action item complete.

E. Advise when the generator is installed.

F. Action item open. Provide a list of qualified individuals who are available for training of wharf technicians on the start-up, operation, and shut-down of the VRS and associated wharf duties.

H. SLC staff accepts PRC'S explanation and plan of action. Action item complete.

Commission staff expects full compliance with all of the items listed above before SLC grants permission to operate the VRS on an ongoing basis.

Sincerely,

Kevin Mercier
Assistant Division Chief

cc: Charles Warren
J. M. MacDonald, Captain, USCG

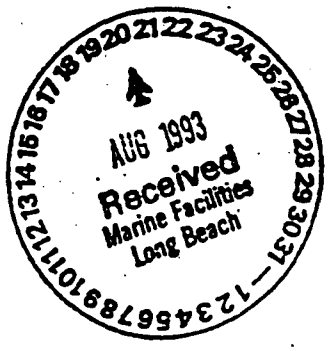
bcc: Jane Sekelsky
Mark Meier
Dan Gorfain
Pete Johnson
NCFO

W 9777.14

PACIFIC REFINING COMPANY
A Joint Venture of Sinochem and The Coastal Corporation Subsidiaries

P.O. BOX 68 (510) 799-6000
4901 SAN PABLO AVENUE FAX (510) 799-6042
HERCULES, CALIFORNIA 94547

August 16, 1993



Kevin Mercier
Assistant Division Chief
State Lands Commission
330 Golden Shore, Suite 210
Long Beach, CA 90802-4246

Re: Proof of Safety and Condition of Vapor Recovery System (VRS) at Hercules Terminal

Dear Mr. Mercier:

In response to your letter dated August 12, 1993, Pacific will advise you when the remaining items are installed. We anticipate completion of all remaining items by early September.

With regards to the names of qualified individuals who are available for training of Wharf Technicians on the start-up, operation, and shut-down of the VRS and associated wharf duties, the following lists those names:

VRS OPERATION	WHARF DUTIES
Dave James	Bill Bacon
Dean Neitz	Myles Butler
Dave Bell	VRS Qualified Individuals

Sincerely,

Ralph J. Edwards
Director, Environmental and External Affairs

RJE:qew

cc: Paul Miller
Bill Bacon
Myles Butler
Chris McDowell
John Sakamoto

CALENDAR PAGE	239
MINUTE PAGE	2451

EXHIBIT D -13