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- 1 • Pressure relief valves are inspected, serviced, tested to confirm the set pressure,  
2 and retagged on an interval that is determined for each relief valve. The typical  
3 interval for inspection and maintenance is 1 year.
- 4 • The fabrication and inspection requirements of American Society of Mechanical  
5 Engineers B31.3 are met for process piping. After installation of new piping, all butt  
6 welds are inspected using a combination of visual, radiographic, and hydrostatic  
7 testing techniques. All socket welds are inspected using a combination of visual,  
8 radiographic, dye penetrant, magnetic particle, and hydrostatic inspection  
9 techniques. Baseline ultrasonic thickness measurements are taken upon  
10 installation.
- 11 • Routine maintenance of lighting, bollards, life rings, etc. occurs as needed.

### 12 **2.5.1 Inspection Programs**

13 Facility inspections are performed by the USCG, BAAQMD, and CSLC. The BAAQMD  
14 has the authority to issue Notices of Violation as well as take more severe enforcement,  
15 if warranted. The USCG and CSLC have jurisdiction over wharf operations. The CSLC  
16 Marine Facilities Division conducts quarterly and annual facility inspections and verifies  
17 instrument charts and gauge readings that must meet State and federal standards. In  
18 addition to agency inspections, the Refinery self-certifies its own maintenance and  
19 inspections of the facility. The Terminal equipment inspection program consists of annual  
20 component inspections and structural inspections of the wharf, approach trestle, and  
21 associated pipelines. Structural and pipeline inspections are routine components of  
22 facility operation. The Refinery also contracts third-party inspectors, as needed, to  
23 complete additional inspections for operational safety, facility integrity, and regulatory  
24 compliance purposes.

25 Comprehensive inspections of all Amorco Terminal mechanical, instrumental, electrical,  
26 and structural systems are performed in accordance with MOTEMS requirements.  
27 Inspection reports are transmitted to the CSLC Marine Facilities Division upon  
28 completion. MOTEMS audits are completed and transmitted to the CSLC Marine Facilities  
29 Division on a triennial basis. Audit results can result in additional rehabilitation,  
30 maintenance, or monitoring, as needed. In accordance with MOTEMS, post-event  
31 inspections are also performed after significant, potentially damage-causing events.

### 32 **2.5.2 Maintenance Dredging**

33 The ship berthing area north of the Terminal is dredged periodically to maintain a depth  
34 of approximately 48 feet below MLLW, although the Terminal's operating limits indicate  
35 that a minimum water depth of 44 feet must be maintained. Bathymetric surveys are  
36 conducted quarterly and maintenance dredging is only conducted as required to maintain  
37 minimum required depths. The last Amorco dredging event, conducted in 2005, entailed  
38 removal of 500 cubic yards of spoils. Spoils removed in 2005 were disposed at the

1 Hanson Aggregate site, located north of Waterfront Road just west of Pacheco Creek, in  
2 accordance with Amorco Terminal Water Quality Certification requirements of the San  
3 Francisco Bay Regional Water Quality Control Board (RWQCB). Scheduled maintenance  
4 dredging is known sufficiently in advance and Tesoro would continue to comply with  
5 applicable permits to ensure appropriate assessments are conducted prior to conducting  
6 maintenance-related dredging. Dredged spoils are tested and managed according to  
7 permits issued by jurisdictional agencies, including the CSLC, U. S. Army Corps of  
8 Engineers, San Francisco Bay Conservation and Development Commission, and San  
9 Francisco Bay RWQCB.

## 10 **2.6 EMERGENCY RESPONSE**

### 11 **2.6.1 Emergency Shutdown**

12 Transfer operations at the Amorco Terminal may be suspended when any of the following  
13 conditions has occurred:

- 14 • breakdown or loss of communication between operator and vessel;
- 15 • oil spillage on deck or to surrounding waters;
- 16 • fire/explosion (on vessels or on Terminal);
- 17 • excessive wind, current, or passing vessel conditions that compromise safe  
18 mooring management of vessels;
- 19 • marine incidents such as collision or impending collision, close-passing vessels  
20 that create surge off the dock, and/or personnel incidents on board that threaten  
21 the safe transfer of oil;
- 22 • slack in mooring lines;
- 23 • significant earthquake or other natural events (e.g., tsunami) that may compromise  
24 the safe transfer of oil; or
- 25 • vessel drifting off-spot, affecting safe use and operation of the transfer hoses.

26 Should an emergency occur while a vessel is discharging, the TPIC will use radio, voice  
27 communication, or air horn to notify the tank vessel to immediately shut down transfer  
28 operations, per California Code of Regulations, Title 2, section 2340, including the  
29 shutdown of pumps and closing of valves on board the vessel. Shut-off valves, both  
30 manual and motor operated, are located on the wharf to close off the transfer hoses and  
31 the crude lines connected to the shore pumps and tankage. Isolation valves for all transfer  
32 lines are located onshore at the end of the approach trestle. If the ship loading-hose  
33 connection breaks loose while pumping oil offshore, block valves, located on the wharf,  
34 stop flow of oil from the shore facility into the water.

1 The TPIC will notify on-site security staff immediately, and if needed, Tesoro's Emergency  
2 Medical Technicians would be dispatched from the Refinery and the city of Martinez Fire  
3 Department would be notified. Subsequently, the USCG and the ship's agent would be  
4 notified. In the event of an oil spillage, agencies would be notified in accordance with  
5 Tesoro's Operations Manual and the Oil Spill Contingency Plan.

### 6 **2.6.2 MOTEMS Tsunami Considerations**

7 The National Oceanic and Atmospheric Administration (NOAA) operates two tsunami  
8 warning centers in the United States: The West Coast/Alaska Tsunami Warning Center  
9 (WCATWC) and the Pacific Tsunami Warning Center. The two tsunami warning centers  
10 collaborate to provide tsunami warning service and mutual backup to coastal regions in  
11 the United States and in other countries worldwide. The WCATWC Area of Responsibility  
12 includes the United States West Coast where the Amorco Terminal is located. The  
13 WCATWC operates 24 hours every day and records data from approximately 600 seismic  
14 stations that are funded and operated by different agencies, including the U.S. Geological  
15 Survey, Global Seismic Network, and NOAA. An earthquake that activates an alarm  
16 initiates an earthquake and tsunami investigation that includes automatic locating and  
17 characterization of the earthquake, earthquake analysis and review, sea-level data  
18 analysis and tsunami forecasting, and dissemination of information to the appropriate  
19 emergency management officials and systems. Notifications issued by the WCATWC are  
20 communicated directly via cell phone to Tesoro personnel responsible for marine  
21 operations. Tesoro personnel take appropriate action as required to insure personnel  
22 safety and to minimize potential impact to the environment and equipment. These actions  
23 may include stopping oil transfer, disconnecting hoses, and calling for tugs to hold the  
24 vessel securely to the Amorco Terminal or assist in setting sail.

25 Per MOTEMS, Tesoro maintains a Tsunami Response Plan that considers the possible  
26 effect of tsunamis on the Amorco Terminal.

### 27 **2.6.3 MOTEMS Sea-level Rise Considerations**

28 MOTEMS (Cal. Code Regs., tit. 24, § 3103F.5.3.4) requires that each terminal consider  
29 the predicted sea-level rise over the remaining life of a terminal. Tesoro has and will  
30 continue to consider sea-level rise in Amorco Terminal assessments.

31 Tesoro conducts hydrographic surveys at the Amorco Terminal on a quarterly basis and  
32 conducts underwater and above water structural MOTEMS inspections. These surveys  
33 and inspections would over time detect increased water depth and potential corrosion at  
34 higher-elevation splash zones. The Amorco Terminal Operating Limit diagrams will be re-  
35 evaluated when subsequent MOTEMS audits deem the sea-level rise to be significant  
36 enough to impact operations.

1 **2.6.4 Amorco Terminal Oil Spill Response Capability**

2 Table 2-3 lists available oil spill response equipment, as identified in Tesoro's Amorco  
3 Marine Oil Terminal Oil Spill Response Plan (2008). Should an oil spill occur, equipment  
4 listed in the table would be used during an initial response to the spill.

5 Tesoro has contracted with Bay Area Ship Services to assist with initial oil spill response  
6 services, including the immediate execution of approximately 600 feet of harbor boom in  
7 approximately 30 minutes. In addition, Tesoro contracts with Marine Spill Response  
8 Corporation (MSRC) to serve as the primary Oil Spill Response Organization contractor  
9 in its Oil Spill Response Plan for offshore, onshore, and shallow-water response services.

10 MSRC maintains an extensive inventory of privately owned spill response equipment.  
11 This equipment is solely dedicated to spill response, and is stored and maintained at  
12 MSRC's 51 equipment pre-position sites across the United States. MSRC's capabilities  
13 are augmented by a network of over 90 participants in the Spill Team Area Responders  
14 program, an affiliation of environmental response contractors located throughout the  
15 country.

16 The CDFW's Office of Spill Prevention and Response and the USCG issue the Area  
17 Contingency Plan, which provides guidance on sensitive sites; initial response  
18 techniques; and response requirements for the type of boom, skimmers, and number of  
19 personnel. Should a spill occur, Tesoro would comply with all federal and State response  
20 plans.

21 Tesoro's Amorco Marine Oil Terminal Oil Spill Response Plan specifies that the following  
22 response equipment and testing procedures must be implemented.

- 23 • Containment Boom: During semi-annual boom deployment exercises, boom shall  
24 be inspected for signs of wear or structural deficiencies. If tears in fabric or rotting  
25 of fabric are observed, the boom shall be repaired or replaced. In addition, end  
26 connectors shall be inspected for evidence of corrosion. If severe corrosion is  
27 detected, equipment shall be repaired or replaced.
- 28 • Response Boats: Response boats shall be put in the water and engines shall be  
29 started at least quarterly. If any mechanical problems are detected, they shall be  
30 addressed or repaired in a timely manner.
- 31 • Other Equipment: Other response equipment shall be inventoried and inspected  
32 to ensure that the stated quantities are in inventory and in proper working order.  
33 Documentation of equipment inspection and deployment exercises are maintained  
34 at the facility.

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**Table 2-3: Amorco Terminal Oil Spill Response Equipment**

Type/Model	Quantity	Size <sup>1</sup>	Deployment Time (hours)	Location
Boom trailer	1	7 ft by 15 ft	1	Boat house
Containment boom with universal connectors	1,000 ft	8 ft by 24 ft	1	Boat house
Miscellaneous hand tools	Various	Various	1	Boat house
Personal Protective Equipment (PPE) Trailer (Model No. C122)	1	8 ft by 12 ft	1	Boat house
Portable generator (Model No. EX-1000)	1	1000 W, 4 cycles, 3600 rpm	1	Boat house
Jon boat (Vessel No. CF 4344 JY)	1	12 ft	1	Boat house
Johnson outboard motor with gas tank	1	15 hp	1	Boat house
	1	9.9 hp	1	Boat house
Miscellaneous PPE	Various	Various	1	Boat house
Miscellaneous equipment and absorbents	Various	Various	Various	Various
Miscellaneous hand tools	Various	Various	1 to 4	Boat house
Boat, V-hull with trailer	2	12 ft	1 to 4	Boat house
Jon boat	3	10 ft, 12 ft	1 to 4	Boat house
Boat motors	4	15 hp	1 to 4	Boat house
	1	9.9 hp	1 to 4	Boat house
	1	20 hp	1 to 4	Boat house
Containment boom with universal connections	1,200 ft	8 by 24	2 to 4	Avon wharf
	1,000 ft	9 by 9		
	2,400 ft	8 by 24	--	Amorco wharf
	1,000 ft	4 by 8	1 to 4	Boat house
PetroMesh with oil snares (cases) "pom-poms"	10	3 ft	1 to 4	Boat house
Type 270 sorbent sausage	105	8 in by 40 ft bag	1 to 4	Boat house
	16	8 in by 40 ft bag	1 to 4	Avon wharf
	13	8 in by 40 ft bag	--	Amorco wharf
Type 151 sorbent sheets	100	100 per package	1 to 4	Boat house
	46	100 per package	1 to 4	Avon wharf
	14	100 per package	--	Amorco wharf
Type 126 sorbent sweeps	80	100 ft per package	1 to 4	Boat house
	48	100 ft per package	1 to 4	Avon wharf
	25	100 ft per package	--	Amorco wharf
Type 100 absorbent rolls	35	100 ft per package	1 to 4	Boat house
	5	100 ft per package	--	Avon wharf
	5	100 ft per package	--	Amorco wharf

2.0 Project Description

Type/Model	Quantity	Size <sup>1</sup>	Deployment Time (hours)	Location
Vessels "Avon I" Munson Hammerhead Serial No. ALF with Volvo/Penta AQAD 42/290 single prop motors. <ul style="list-style-type: none"> <li>• Motor Serial Nos. 2204132960, Stern Drive Serial Nos. 3102051898</li> <li>• Motor Serial Nos. 2204132936, Stern Drive Serial Nos. 3102051897</li> </ul>	1	30 ft  200 hp  200 hp	1	Martinez Marina
Avon II, Make: Kvichak work boat	1	24 ft	1	Martinez Marina
Pacific Trailer, Serial No. 40R1A2LJ49A028795. License No. 4KR3764	1	6 ft by 24 ft	1	Boat house
Yamaha 150 TXRX, Serial Nos. 6G4X-050267 & 6 KOX-297780 Motor Serial Nos. G03110184 & G03110162 (1999)	2	150 hp	1	Martinez Marina
Whaler III, Make: Boston Whaler (1979), Model: BWCC 7220. Vessel No. C9091 GK. Work Order No. 88482. (Back-up for Avon I, II or IV when out for service)	1	17 ft	2	Boat house
Brough Trailer. Model No. 72, Serial No. 251198	1	12 ft	2	Boat house
Pacific Trailer. Model No. 72, Serial No. 251198	1	12 ft	2	Boat house
Johnson 50 (1990)	2	50 hp	2	Avon wharf
SV I, Make: Avon (1992), Model S4. 65 RIBS, Vessel No. CF4908 JZ. Work Order No. 86649	1	13 ft	2	Boat house
Calkins Trailer, License No. 1DW9210	1	13 ft	2	Boat house
SV II, Make: Avon (1992), Model S4. 65 RIBS, Vessel No. CF5089 ND. Work Order No. 86647	1	13 ft	2	Boat house
E-Z Loader Trailer, Model EZ14-16, License No. 1DX5714	1	13 ft	2	Boat house

Source: Tesoro's Amorco Marine Oil Terminal Oil Spill Response Plan 2008

<sup>1</sup> Units of Size: ft = feet; hp = horsepower; rpm = revolutions per minute; W = watts; in = inch

<sup>2</sup> Discontinued, remaining inventory on hand

## 1 **2.6.5 Process Safety Controls**

2 The objective of the Amorco Terminal control systems is to provide controls to transfer  
3 crude oil from a ship docked at the Amorco Terminal to onshore tankage both reliably and  
4 safely while minimizing environmental concerns. The controls to meet these objectives  
5 consist of the following systems and subsystems:

- 6 • isolation valve monitoring and control system,
- 7 • crude metering system,
- 8 • mooring line tension monitors,
- 9 • process safety equipment, and
- 10 • fire protection system.

11 Descriptions of these systems are provided below.

### 12 **Isolation Valve Monitoring and Control System**

13 Amorco Terminal isolation valves are motor-operated valves (MOV) equipped with  
14 Limitorque actuators, push-button controls, and status lights. Valves are controlled via  
15 Local Control Panels located in offshore buildings (refer to Section 2.3.1). Remote  
16 switches are also located at each MOV so that valves can be manually opened or closed  
17 if required. MOVs located at the unloading manifold can close within 30 seconds, per  
18 CSLC requirements.

19 As discussed in Section 2.4.7, crude oil is pumped from the Amorco Terminal to onshore  
20 tankage via pumps located on the vessels. Pump and over-pressurization protection for  
21 the vessel and associated discharge lines are provided by the vessel. Thermal relief to  
22 the slops system is provided via relief valves located on each of two 10-inch discharge  
23 lines. Pressure transmitters on the crude line display pressure in the control room and  
24 alert operators to abnormal conditions. Under emergency conditions, Amorco Terminal  
25 operators would alert the ship and shut down the transfer.

26 Two 10-inch hoses used for unloading crude from the vessel connect to the two 10-inch  
27 discharge lines, each equipped with its own MOV. The purpose of the two 10-inch  
28 manifold MOVs is to isolate the wharf from the tank fill lines in the event of a leak or a fire.  
29 As the valves are located within the zone of a potential wharf fire, they are fireproofed.  
30 These are high-performance valves, specially designed for fast closure (under 30  
31 seconds). In addition to the two 10-inch isolation valves, another isolation valve is  
32 provided on the 20-inch line at the Y on the wharf approach, and another 20-inch MOV is  
33 located onshore.

34 The Local Control Panels can open and close the MOVs on the wharf and can close the  
35 20-inch MOV onshore. In addition to these Local Control Panels, offshore control panels

1 receive status information from all isolation valves and can be used to open or close the  
2 MOVs, as needed.

### 3 **Crude Metering Skid System**

4 A new system to meter the amount of crude being discharged from a vessel was installed  
5 in 2007. This crude metering skid, which is located just downstream from the onshore  
6 Jurisdictional Valve, also analyzes the crude for water. There are two Instrument Analyzer  
7 overview screens available to assist the TPIC in monitoring the process of safely  
8 discharging crude oil feedstock. In addition to the metering skid display, the screen also  
9 shows the status of the on-wharf fire pump, high-pressure alarm settings, and sump level.

### 10 **Mooring Line Tension Monitors**

11 This system is designed to continuously monitor the tension of vessel's mooring lines  
12 while moored at the Amorco Terminal. Low and high settings are manually set at each  
13 hook (current settings are 1 ton and 25 tons). An alarm at the mooring hook will sound if  
14 either one of the parameters are exceeded.

15 A foghorn is also provided that activates manually using an on/off switch. Sensors for  
16 wind direction and speed, as well as water current direction and speed, are displayed, as  
17 required by the USCG and CSLC.

### 18 **Process Safety Equipment**

19 Process safety equipment is provided as a function of the process design. Relief valves  
20 protect vessels and pipelines from over-pressuring. Fail-safe valves assume their  
21 designed positions (closed/open) in case of incorrect pressure or loss of electrical power,  
22 or instrument air. These features provide protection against over-pressuring of vessels or  
23 lines and potential loss of containment.

24 Alarms are installed at specific points in the process to monitor parameters critical to the  
25 proper operation of the unit. Exceeding a set point, altering a particular process, or  
26 shutting down equipment can cause an alarm. These alarms also provide the operator  
27 with a forewarning of the conditions that, if left uncorrected, may activate specific  
28 automatic process responses such as relief valve opening, automatic shutdowns  
29 (interlocks), etc. Some alarms are connected to an interlock as part of the safety design.  
30 When activated, these interlocks perform specific automatic actions such as closing or  
31 opening valves, de-energizing pumps or other equipment, or preventing start-up of  
32 equipment.

33 Equipment and vessels are protected from over-pressuring by Pressure Safety Valves  
34 (PSVs) and by locking open valves to insure an open relief path. At the Amorco Wharf  
35 PSVs relieve into low-pressure piping systems that have an open path back to tankage.

1 Over-pressure conditions are avoided when PSVs automatically open in response to  
2 process pressures reaching the PSVs set points. The PSVs automatically close when  
3 process pressures drop back below the PSVs set points. PSVs associated with pipelines  
4 and the Amorco wharf are replaced yearly per CSLC and USCG regulations to ensure  
5 correct operation.

## 6 **Fire Protection System**

7 The Amorco Terminal is equipped with firewater and foam systems that can be activated  
8 in the event of a fire. Firewater is currently supplied by the Shell Refinery. Fire protection  
9 at the Amorco Terminal is provided by the following equipment:

- 10 • onshore firewater pump that takes suction from land-based tankage;
- 11 • offshore firewater pump that takes suction from the Suisun Bay;
- 12 • two fireboat connections that extend over water and tie into the Amorco Terminal  
13 firewater header;
- 14 • multiple hose reels, monitors (portable and fixed), hydrants, and foam tanks  
15 located at the Amorco Terminal;
- 16 • hydrants and monitors located along the approach trestle, spaced at a maximum  
17 of 150-foot intervals;
- 18 • two elevated monitors with foam supply tanks that can be controlled both manually  
19 and automatically from remote locations (back-up foam supply line that can be  
20 supplied from onshore pumper trucks);
- 21 • offshore subdeck sprinkler systems, located underneath the firewater pump; and
- 22 • multiple portable and wheeled dry chemical extinguishers at the Amorco Terminal.

23 The offshore and onshore firewater protection systems are interconnected and work in  
24 conjunction to maintain firewater pressure. San Francisco Bay water from the vertical  
25 firewater pump located on the wharf is used as the primary source of water. If a low-  
26 pressure situation occurs, the wharf pump will start automatically. If the low-pressure  
27 situation were to continue, the secondary onshore firewater pump would start and provide  
28 fresh water from the two firewater tanks onshore.

29 A 14-inch line supplies firewater from the onshore firewater tanks to the Amorco Terminal  
30 (refer to Figure 2-3). The line runs the length of the approach trestle to the extreme  
31 eastern end of the wharf, ending with a valve and fireboat connection for hook up to the  
32 firewater system. A 12-inch line splits off of the 14-inch line and supplies firewater to the  
33 western end of the wharf. This line also has a valve and fireboat connection. There is also  
34 a 6-inch line that comes off the 14-inch line near the eastern end of the wharf. Monitors  
35 and hose reels are installed at reasonable intervals. Additional dry hydro-chem carts are  
36 placed along the wharf near the elevated monitors.

1 Two 30-foot-tall monitors located on each side of the unloading manifold have automatic  
2 and remote start-up capabilities. These monitors are capable of vertical and horizontal  
3 sweeps with foam water mixers and adjustable-nozzle water patterns. A 1,000-gallon tank  
4 containing 1 percent foam is located near each monitor. There is enough foam to fight a  
5 fire for 1 hour. If a fire lasts more than 1 hour, emergency equipment can be hooked up  
6 to a 3-inch dry line, and 3 percent foam can be pumped onto the wharf. Portable trailers  
7 filled with 3 percent foam are stationed at the shore end of the wharf. Solenoid valves are  
8 used to open the separate 1 percent and 3 percent foam lines. Flow of water/foam is rated  
9 at 1,500 gallons per minute and 100 pounds per square inch. Two control panels allow  
10 crews to remotely fight fires. A manual control unit is also located at the monitors.

11 In addition, a sprinkler system has been installed at the berth, under the containment pan,  
12 on the eastern end of the wharf. This is necessary because foam and water sprayed on  
13 top of the wharf will not flow under the wharf due to the (intentional) sealing that the pan  
14 creates. At appropriate spacing along the wharf approach and berth, holes have been cut  
15 in the wooden wharf deck planking (covered by metal plates) to allow personnel to lower  
16 cellar nozzles to fight fires below deck. Part of the under-deck sprinkler system also  
17 protects the firewater pump shelter that houses the pump, motor, gearbox, and support  
18 structures in case of a fire.

19 Fire protection equipment and procedures, including fire equipment function, features,  
20 operation, and arrangement, are compiled in the *Amorco Marine Oil Terminal Fire*  
21 *Protection Plan (2011)*. This plan includes photos and maps documenting the locations  
22 of fire-protection equipment for Amorco Terminal personnel. Fire response is performed  
23 by Tesoro's Emergency Response Team (ERT) on-site at the Golden Eagle Refinery.  
24 Back-up support may be provided under mutual aid from other nearby refineries. ERT  
25 firefighters receive an initial 40-hour basic fire-response training taught at the Golden  
26 Eagle Refinery, as well as annual 32-hour live-fire training at an off-site fire school.  
27 Monthly refresher and enhancement trainings are provided for ERT day workers and  
28 twice per quarter for ERT shift workers.

29 Tesoro's personnel and ERT is not responsible for shipboard fire management, as that is  
30 the responsibility of the vessel's crew. In the event of a shipboard fire, Tesoro would  
31 provide shore-side assistance from the Amorco wharf, in accordance with Tesoro's  
32 Operations Manual and Fire Response Plan. All other onshore or offshore fires at the  
33 Amorco Terminal would be managed by Amorco Terminal personnel and the ERT, in  
34 accordance with Tesoro's Operations Manual and Fire Response Plan.