APPENDIX E

Project Description Detailed Elements

E

PROJECT DESCRIPTION DETAILED ELEMENTS

E.1 Codes, Standards, and Specifications Governing Design and Construction

The Proposed Project and Reduced Project Alternative would be designed, constructed, and operated in accordance with the following codes, standards, and specifications applicable to industrial structures and marine terminals in southern California generally, and marine oil terminals, tank farms, and pipelines in particular.

- Maritime Transportation Security Act of 2002 (46 Code of Federal Regulations [CFR] 701 and 33 CFR 101-106)
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (40 CFR 300): National Oil and Hazardous Substances Pollution Contingency Plan)
- U.S. Department of Transportation (DOT): Title 49 CFR, Chapter I, DOT, Part 195 (Design, construction, maintenance, and operation of pipelines)
- California State Lands Commission: "Marine Oil Terminal Engineering and Maintenance Standards," (MOTEMS) Chapter 31F, Title 24, Part 2 California Code of Regulations (2004)
- State of California: Senate Bill (SB) 2040 (Hazardous materials security)
- California Department of Transportation: Standard Provisions; Seismic Design Criteria, Version 1.3 (February 2004)
- South Coast Air Quality Management District (SCAQMD): Rule 1302 (h) Best Available Control Technology (BACT), Petroleum Storage Tanks
- City of Los Angeles: Building Code, 2002 Ed. (on-shore buildings only)
- Los Angeles City Division 95: Marine Oil Terminals, Tank Vessels, and Barges Fire Code
- Port of Los Angeles: Code for Seismic Design, Upgrade and Repair of Container Wharves (5/18/2004)
- National Fire Protection Association: Standards 20 (Standard for the Installation of Stationary Pumps for Fire Protection), 24 (Installation of Private Fire Service Mains and Their Appurtenances), 30 (Flammable and Combustible Liquids), 70 (National Electrical Code, applicable sections), and 307 (Construction and Fire Protection of Marine Terminals, Piers and Wharfs)

- International Code Council: Uniform Building Code 1997
- American Petroleum Institute (API) Recommended Practices (RP) and Standards
    - 2A-WSD for Planning, designing and constructing fixed offshore platforms (Dec 2000)
    - RP 500C Classification of areas for electrical installation of petroleum and gas pipeline transportation systems
    - RP 2003, Protection against ignitions arising out of static, lightning and stray currents
    - Standard 650, Welded Steel Tanks for Oil Storage
    - Standard 653, Tank inspection, repair, alteration, and reconstruction
    - Standard 1104, Welding Pipe Lines and Related Facilities
- American Society of Mechanical Engineers (ASME)/American National Standards Institute (ANSI): B31.4, "Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia, and Alcohols," (use latest edition at time of design)
- Oil Companies International Marine Forum (OCIMF), International Chamber of Shipping (ICS) and International Association of Ports and Harbors (IAPH): International Safety Guide for Oil Tankers and Terminals (ISGOTT), 5th edition, 2006 (relevant sections)
- OCIMF: Mooring Equipment Guidelines; Fire Protection and Emergency Evacuation Guide
- Military Handbook (MIL-HDBK) Structural Engineering Sections
    - 1002/1, General Requirements (30 Nov. 87);
    - 1002/2A, Loads (15 Oct. 96)
    - 1002/3, Steel Structures (30 Sep. 86)
    - 1002/4, Concrete Structures (Sep.86); 1002/5, Timber Structures (30 Mar. 87)
    - 1025/1, Piers and Wharves (30 Oct. 87)
- Port International Navigation Association (PIANC): Guidelines for the Design of Fender Systems
- International Maritime Organization: International Ship and Port Facility Code
- American Concrete Institute: Building Code Requirements for Structural Concrete ACI 318
- American Institute of Steel Construction (AISC): Manual of Steel Construction (Load and Resistance Factor Design, and Allowable Stress Design), 13th Edition, 2006
- American Welding Society: Structural Welding Code - Steel, AWS D1.1; Structural Welding Code for Bridge Structures ANSI/AWS D1.5

- Steel Structures Painting Council (SSPC): Good Painting Practice (Vol. 1&2).

E.2 Marine Terminal Design and Operation

The engineering and design for the Pier 400 marine oil terminal at Berth 408 would be based primarily on the "MOTEMS" Chapter 31F, Title 24, Part 2 California Code of Regulations, promulgated by the State Lands Commission. These regulations were adopted by the California State Lands Commission (CSLC) and are the most advanced of their kind (CSLC 2004). The Port of Los Angeles Code for Seismic Design, Upgrade and Repair of Container Wharves (5/18/2004) would supersede "MOTEMS" in case of conflict and specifically only if proven to be more severe or restrictive. This hierarchy would ensure a conservative design compatible with both codes. Specifications of the marine terminal equipment are provided in Table E-1, and the types of commodities that would be handled at the marine terminal are described in Table E-2.

Table E-1. Material and Construction Specifications and Dimensions

Component	*Specifications*
Marine Terminal	
Crude Stripping Pumps	20 HP positive displacement, 125 gpm, 150 psig discharge
Bunker Fuel Stripping Pumps	7-10 HP positive displacement, 50 gpm, 150 psig discharge
Unloading Arms	80 ft high, 50,000 lbs; air-operated gate valves
Fire Water System	Two 3,000 gpm, 150 psig vertical can pumps; Stem-and-yoke valves
Foam System	1,100-gpm; remote-controlled; aqueous film forming foam (AFFF) concentrate storage and proportioning capability
Compressed Air	4" line
Storm Water System	6" curbing of 3,234 sq ft (300 sq m) of deck; 2,500-gallon concrete under-deck sump; twin 100-gpm pumps; 6" piping
Tank Farms	
Crude Storage Tanks	API-650 internal floating roof welded steel with primary and secondary seals
Fire Water System	Two 3,000 gpm, 150 psig vertical can pumps; Stem-and-yoke valves
Pipelines	
42" Pipelines	0.75-inch wall thickness
36" & 24" Pipelines	API Spec 5L line pipe, standard or XS wall
16" Pipelines	Schedule 40 or Schedule 80
All pipelines	External coating; cathodic protection system

Table E-2. Characteristics of Petroleum Liquids Expected to Be Handled by the Proposed Project

Product	*NFPA Rating (H,F)*	*Flash Point (^{o}F)*	*Specific Gravity @ 60^{o} F*	*Lower Flammable Limit (%)*	*Upper Flammable Limit (%)*	*Mol. Wgt*	*Vapor Pressure @ 85^{o} F (mm Hg)*
Crude Oil	2,3	19	0.9	0.6	15	100	25.8
Vacuum Gas-oil	0,2	>158	0.91	1	5		6
Raw Gas-oil							
Low Sulfur Gas–oil	1,2	125-180	0.81-0.88	0.30	10		0.4
High Sulfur Gas-oil	1,2	125-180	0.81-0.88	0.30	10		0.4
Desulfurized Gas-oil	1,2	125-180	0.81-0.88	0.30	10		0.4
Light Cycle Oil	1,2	140-190	0.84-0.93	0.40	8		<5.0
Hydrotreated Gas-oil	1,2	100	0.865	0.70	5		0.5
Fuel Oil Cutter Stock	0,1	182	0.85-0.88	1	10	<400	<0.1
Heavy Coker Gas-oil	1,0	NA	0.8	NA	NA		
Heavy-cycle Gas-oil							
Decant Oil	1,2	160	1.02				<1
Carbon Fuel Oil							
Carbon Black Oil	1,2	140-300	0.88-1.02	0.90	7		<5.2
Carbon Black Feed	1,2	140-300	0.88-1.02	0.90	7		<5.2
Carbon Black Feedstock	1,2	140-300	0.88-1.02	0.90	7		<5.2
Gas Oil	3,2	125-180	0.81-0.88	0.30	10		0.4
Cycle Oil	1,1	248	0.88	NA	NA		<1
Residual Oil	1,2	140-300	0.88-1.02	0.90	7		<5.2
Feedstocks	1,1	350					
Marine Diesel Oil	1,2	100-199	0.78-0.955	0.30	10		<0.1
Marine Fuel Oil	0,2	125-190	0.84-0.93	0.40	8		<5.2
Marine Gas Oil							
Bunker Fuel Oil	1,2	<131	0.887-0.937	0.40	8		2.12 - 26.4
Heavy Fuel Oil	2,2	151	0.96-0.98	1	5		1 - 15
Bunker Oil	1,2	>131	0.887-0.937	0.40	8		2.12 – 26.4

Note: Blank cells indicate that no data were supplied by the applicant.

Berth Dock Structures. The proposed berth platform structure would be supported with steel and/or pre-stressed concrete piles and would include six mooring dolphins with quick release hooks and power capstans; a mooring and fendering system; offloading arms; an electric-motor-driven derrick cargo crane; a davit crane (boat lowering crane); 4,000 feet (ft) (1,219 meter[m]) of spill boom storage; two pile-supported trestles connecting the platform to the shore (one for piping, one supporting a single-lane access road); low-impact area lighting systems; offshore structure cathodic protection corrosion prevention systems; navigational lighting systems; and conduit, cable trays, wiring, instrumentation and controls, and grounding systems. The in-water components of the berth dock would require steel piles ranging from 48 inches to 54 inches outside diameter and pre-stressed concrete piles of 24 inches outside diameter, as described in Chapter 2.

Mooring and Fendering System. Tankers would generally be moored starboard (right) side to the mooring facility, although under occasional, non-typical events, a vessel could be moored port (left). The mooring facility would be designed in accordance with the latest ISGOTT and OCIMF tanker mooring guidelines to accommodate the range of ships expected to call at the facility (Table E-1). Each mooring point would be equipped with quick release mooring hooks to allow rapid unmooring of the vessel in case of emergency.

The berth platform would be fitted with a fendering system to accommodate 170 ft x 44 ft (52 m x 13 m) bunkering barges that would supply vessel fuel to the marine terminal. Between the loaded barge at low tide and the ballasted barge at high tide, there would be about a 10-ft (3-m) elevation change that the fender system would have to accommodate. The fender boards would be approximately 15- to 20-ft (4.6- to 6.1-m) high to accommodate the barge at all tide levels.

Mooring cleats for the barge lines would be provided on the unloading platform and the inner breasting dolphin structures. Details of the barge fendering and mooring hardware would be developed further during the detailed design phase of the proposed Project.

Offloading Arms. The berth would be designed for four offloading arms (hard-pipe flexible systems for transferring crude oil) and one arm for loading and offloading vessel fuel. The arms would be designed to rotate more than 180 degrees to allow for the vertical movement of the vessel due to tide and cargo operations, and would be equipped with a warning system that would sound when the limits of movement are approached. The offloading arms would be moved by their electro-hydraulic control system, which would be located near the bunker fuel loading and offloading arms. A series of solenoid valves would be cycled to drive the offloading arm rams, which in turn would control swing, and upper and outer arm reach. Each offloading arm would be equipped with a mechanically engaged parking lock to secure it while stowed.

The offloading arms would be approximately 80 ft (24.4 m) high, with an empty weight of 50,000 lbs and 16-inch-diameter piping. These numbers could vary based on the specific dimensions required for the Berth 408 application. A fixed control station located in a strategic location for good visibility, and wireless handheld control stations for operator mobility to get close to the arm and ship's manifold, would be provided. The unloading arms would be equipped with Quick Connect/Disconnect Couplers (QC/QDs) at the manifold. Hydraulic motors would open and close the locking cams on the quick-connect/disconnect couplers.

Containment Curbing and Sump System. All deck areas that would be subject to potential leaks, spills and drips from equipment, pipe flanges, pumps, loading arms, valves, etc. would be contained within a 6-inch-high curbed 3,234 square feet (sq ft) (300 square meter [sq m]) area. Rainwater falling within this area would be collected and drained to a 2,500-gallon concrete sump under the deck. Twin 100-gallon per minute (gpm) pumps would start in sequence on high level. The contact rainwater from this sump would then be pumped through a 6-inch line to a water treatment separator located at Tank Farm Site 1 and subsequently discharged pursuant to an NPDES permit.

Piping, Pumps, and Valves. All piping on the berth platform and in the marine terminal would be API Spec 5L line pipe, standard or XS wall for the large lines, except for the 42-inch crude line, and Sch 40 or Sch 80 for the smaller lines (Table E-1). The 42-inch crude line would be 0.75-inch wall thickness pipe to accommodate seismic and thermal stresses. Piping would be supported above deck on guided or anchored supports.

Since the offloading arms must be moved and stored empty, two 125 gpm, 20 horsepower (hp), positive displacement, 150 psig discharge dockside stripping pumps for crude and two 50 gpm, 7 to 10 hp dockside stripping pumps for fuel would be provided to empty the arms after each transfer operation. These pumps would be capable of drawing suction at negative pressure. The crude oil and bunker fuel would be pumped back into their respective pipeline systems to salvage the liquids. The shoreside crude stripping pumps could be used to drain the crude or fuel lines on the platform and trestle if needed. The crude or fuel would be pumped into their respective shore side pipelines. In addition, a slop/drain tank would be provided for any miscellaneous oil draindowns not piped directly to the stripping pumps. The stripping pumps would be plumbed to pump the contents of that tank into the pipeline to salvage the liquids. The pumps on the unloading platform could also serve as containment area rainwater (or contact water) sump pumps.

The crude oil and bunker fuel stripping pumps could be interchanged for backup or service requirements, but bunker fuel stripped by the crude pumps would be sent down the crude line. The bunker stripping pump would have to be thoroughly flushed after use with crude. Two 100 gpm contact water pumps would be vertical turbine pumps drawing runoff water from a sump under the deck. Each one would be capable of handling the maximum design rainfall; the other would serve as a backup.

Most of the valves on the unloading platform would be gate valves, while fire water valves would be the outside stem and yoke type. The outlets on each of the loading arms would be air-operated gate valves that would close at a controlled rate in case of a loss of control power or air supply. Check valves would be used on various lines in the system to prevent backflow. Since the bunker fuel line would be bidirectional, the line would have a two-way valve station with opposite-facing check valves.

Fire Prevention, Detection, and Suppression System. The fire protection system for the Marine Terminal is one of the most critical areas of design. While the various codes and standards for marine terminals are fairly clear and definitive, each terminal has its unique design aspects and physical layout. The codes and standards in Table p-1 related to the fire system that would be applicable or relevant to this facility would be incorporated into the design. MOTEMS would be considered the primary governing standard for this facility, although any of may have additional requirements or details in the other codes that are not addressed in MOTEMS would be incorporated into the design.

Per MOTEMS Section 3108F.2, a detailed Fire Hazard Analysis and Risk Assessment would be performed. That analysis would assign the proposed Project a fire hazard classification of “HIGH” based on the flash point of crude oil, the volume of crude at the facility, and the flow rate of crude in the system. A site-specific Fire Protection Plan would be prepared as part of the Fire Hazard Analysis and Risk Assessment.

Devices capable of detecting the presence of open flames (Flame Detectors) would be installed at the Marine Terminal. The flame detectors would be positioned to cover strategic areas, such as around motorized pumping areas, and the marine loading dock. The flame detectors would be tied to a flame detector control panel. The flame detectors would have discrimination ability so as not to provide false indications of fire due to reflections from the water, camera flashes, etc. Upon detection of a fire, the flame detectors would automatically trigger a fire alarm signal. Terminal operators would confirm that the alarm is an active fire, notify the Los Angeles Fire Department, and begin fire suppression activities.

The fire-fighting system for the Marine Terminal would be designed to meet applicable fire codes (Table E-1). Two 3,000 gpm, 150 psig vertical can firewater pumps, each with 50 percent of the required capacity, would be installed at the Marine Terminal to serve both the terminal and Tank Farm Site 1. The primary pump would be driven by an electric motor and the secondary pump would be driven by a diesel engine equipped with its own diesel fuel storage tank. A seawater intake system would be provided at the berth as required by Los Angeles City Fire Department.

Four elevated 1,100-gpm, remote-controlled foam fire monitors would be installed, two at the northwest and southwest (outboard) corners of the berth platform and one each on Breasting Dolphins 1 and 4. These monitors would provide complete protection of the berth platform, including all equipment and offloading arms; the outboard half of the pipe trestle and the single-lane trestle; the breasting dolphins; the gangway and tower; and the walkways. The shore-side half of both trestles would be protected by the Los Angeles Fire Department and roadside fire hydrants.

For smaller, localized fires, the platform would have one foam hose reel and four to six portable extinguishers on the deck. Fire detection would be provided by a combination of ultra-violet (UV) and heat detectors located at strategic points on the unloading platform and breasting dolphins.

Two vertical can sea water fire pumps, each rated at 3,000 gpm and 150 psig, would be located on the trestle near shore to augment the high-pressure fire water system. One pump would be electric powered, the other diesel. The pumps would operate in case the normal water source is interrupted or depleted, or a power loss should occur.

Lighting. Lighting would meet City of Los Angeles, Port of Los Angeles, and United States Coast Guard (USCG) requirements. The unloading platform would have a variety of lights, including an 80-ft (24.4-m) high tower to illuminate the loading arms and connection to the ship, and lower deck-level lights to illuminate the equipment and piping in specific areas where additional light is required or where equipment would shadow the tower lighting. The tower would have from four to eight 400-watt fixtures, based on needs determined by lighting calculations. An option that would be considered for the loading arms would be low-level lighting on the arms to assist with nighttime maintenance or operations. If a dockside emissions treatment unit is installed, appropriate lighting would be required.

Utilities and Conduits. Electricity and potable water would be provided by the LADWP and sanitary sewer service by the Los Angeles Sanitation Department. A 4-inch compressed air line would be used primarily for maintenance tools and equipment, but would be available for instrumentation after routing through an air dryer. The potable water line would be sized to furnish water to visiting ships, but it would also be used for emergency shower and eyewash stations, and for fresh water hose-down of equipment. Electrical power sufficient to support AMP and the marine terminal electrical equipment would be supplied by a 34.5 kilovolt (Kv) or higher service.

To conserve trestle space, the conduits to the berth platform would be stacked vertically along the south edge of the pipeway trestle. Depending on the final electrical design, an electrical distribution panel could be needed where the conduits from shore come onto the platform. From there, all conduit would be routed adjacent to piping to minimize space impact. All junction boxes and distribution panels would be totally sealed from the weather and salt air.

Berth Facility Controls. The berth platform would have monitoring instruments that would have both local and remote annunciation (i.e., signal indicators). Some functions of the marine terminal dock facilities, such as manual valves, stripping pumps, and offloading arm positioning, would be controlled locally. Others would be controlled locally or remotely, such as air-operated valves and contact water pumps. The foam fire water monitors would be designed to operate remotely. Automatic operations include flow rate control, transfer start-up and shut-down sequencing, contact water, and storm water pumps. All remote control and monitoring would be processed through a remote programmable logic controller (PLC) unit, which would communicate with the central control PLC and related alarm systems.

One control station would control all five offloading arms through a selector station. The speed of the arms could be adjusted by setting pilot valves on each of the hydraulic branches. The control station would have a permissive logic option which would allow customizing the controls to prohibit arm disconnection and movement unless the arms have been drained. The arms could also be equipped with reach and range limit switches, which would activate an alarm should the offloading arms exceed their design envelope limits Offloading arm operation would be monitored, and loading arm envelope limit alarms would also be sent to the control room. Discharge pressures at the unloading arms would be indicated locally and reported remotely to the control room, and would be tracked for deviations from normal operating ranges.

Both the rainwater sump and the slop/spill tanks would have high level and high-high level switches, remotely annunciated and also reported to the control room.

Operation. Operation of the marine terminal and tank farms would be controlled from consoles in the Marine Terminal Control Building, a stand-alone building that would be manned 24 hours a day by system controllers. The control building would be designed with earthquake protection and multiple security systems to ensure that only authorized personnel enter. In addition, the facility would have two uninterruptible power supplies and a diesel generator to provide continuous power in the event of an external power failure, and fire detection and suppression systems.

To ensure environmental protection and safety, discharge from the vessel to the shore tanks would follow required exchanges of general and emergency information and ship inspections. The ship would use its pumps to move the cargo from the vessel's tanks to the surge tank at Tank Farm Site 1. From Tank Farm Site 1 to Tank Farm Site 2, electric shore-side pumps would be used. The discharge would begin at a slow rate so all systems can be checked for leakage. Once all systems were checked the ship would increase the pumping volume to the safe limits of the ship and the terminal.

During the pre-operational information exchange, emergency shutdown systems and communication would be thoroughly discussed via radio or telephone communication. All shutdowns, whether due to an emergency or not, must be orderly and sequential. If an emergency shutdown were to be required, either terminal personnel or ship personnel would be required to inform each other, via radio, that emergency shutdown was needed. Once a shutdown was ordered, the ship would first stop its pumps and then all valves in the terminal and ship's cargo systems would be closed, thereby isolating the segments of the system to prevent spillage. If the emergency were such to require the disconnection of the offloading arms, the arms would be drained, the hydraulic connector activated, and the arms disconnected.

Once cargo discharge was completed, the ship's pumps would be stopped by the ship's officers and the offloading arms would be drained and disconnected from the ship. After required information and records had been exchanged between the ship and the terminal, the ship would be ready to leave the berth.

E.3 Tank Farm Design and Operation

Tankage. Tank Farm Site 1 would include two internal floating roof, 250,000-barrel (bbl) tanks, one internal floating roof, 50,000-bbl working capacity offload/back-flush tank (surge tank), and one 15,000-bbl storage tank for vessel fuel. The 50,000-bbl tank and both 250,000-bbl tanks would be designed to receive direct offloads of crude oil from vessels at maximum offload rates, thereby allowing for smooth operation of the shore-side pumps. Tanks at Site 2 would all be internal floating roof, 250,000-bbl. The tanks would all be used for temporary storage and transfer of crude oil and partially refined crude oil. The internal floating roof would consist of a steel roof with welded pontoons on the roof to keep the roof floating at all times, including a seismic or other abnormal event that might otherwise cause the roof to be tilled or covered with oil and sink.

All tanks would be designed in accordance with the American Petroleum Institute (API) Standard for Welded Steel Tanks for Oil Storage, API-650. All tanks would be API-650 internal floating roof welded steel with primary and secondary seals and would meet the BACT requirements of the SCAQMD and the SCAQMD rules applicable to above ground storage tanks. The tanks would be drain-dry (i.e., would be designed for the removal of virtually all crude oil as needed). Draining is needed when the product changes (e.g., different types of crude oil with different characteristics), which occurs at irregular intervals and is generally difficult to predict since it depends on market supply and demand. Each tank would be equipped with secondary leak detection systems, overfill protection, and instrumentation to monitor temperature as well as to monitor and control tank level in order to prevent releases to soil or groundwater. The secondary leak detection system would generally consist of a primary-welded and coated-steel bottom that would rest on a bed of sand or other similar material, under which would be installed an impermeable foundation or liner. This system would be designed to monitor for leaks in the steel bottom and prevent the contamination of soil under the tank. Each tank would be designed to allow for monitoring and control from the Marine Terminal Control Building. Dike walls would be constructed around the tank areas with the capacity to provide for full containment of the largest tank's volume in the event of a spill or tank breach, in accordance with state and local codes and guidelines.

Vapor Control. Tank farms would be equipped with a tank vapor collection system to collect emissions generated during tank filling operations when the roof is being floated. The internal floating roof, with the primary and secondary seals, would be used to control emissions at all other times. Each system would include vapor collection pipe headers, a vapor blower, a vapor bladder tank, vapor discharge headers, and associated controls. The collection systems would transport the vapors to incineration systems. The internal floating roof, primary and secondary seals, and vapor collection and control are considered to be BACT for crude oil storage tanks and meet the requirements of the SCAQMD for such tanks.

Thermal oxidizers would be installed at Tank Farm Sites 1 and 2 to incinerate all vapors collected in the respective vapor holding tanks. Each of the tank vapor collection and incineration systems would be designed for automatic control from a local control system and would be monitored remotely from the Marine Terminal Control Building.

Spill Control. Each tank farm site would be enclosed by dike walls with the capacity to provide for full containment of the entire volume of the largest tank in the diked area, plus the volume equal to the 24-hour rainfall associated with a 25-year rain event, in the event of a spill or tank breach, as required by state and local design codes and Los Angeles Fire Department guidelines. Additionally, intermediate dikes designed to contain 10 percent of the tank volume will be constructed around individual tanks.

A process oil recovery system consisting of a sump, sump pump, associated piping, electrical, instrumentation, and controls is proposed for each tank farm to recover liquid from equipment process drains. The oil recovery system would serve the shipping pumps areas, the distribution manifold areas, the pipeline meter areas, and the pipeline scraper launcher/receiver areas.

Each containment sump would have instruments to detect fluid level. If a high level were detected, a pump (or pumps) would automatically start, transferring the contents of the sump into the oily water treating system. A "high-high" sump level would activate an alarm in the Terminal Control Room in the event that the pump(s) could not keep up with increasing fluid level. A high-high alarm would cause a terminal shutdown and require inspection of the facility by an operator.

Fire-Fighting System. The fire-fighting systems for the tank farms would be designed in accordance with applicable City of Los Angeles fire codes. Each tank farm would be equipped with a foam storage tank and proportioning skid. Each tank would be equipped with a foam ring and foam chambers. All systems would be monitored from the Marine Terminal Control Building. Flame detectors and a fire suppression system similar to what would be installed at the Marine Terminal would also be installed at the tank farm sites and would function in the same manner.

The fire-fighting system for Tank Farm Site 1 would be part of the marine terminal system described in section E.1. Tank Farm 2 would have a separate fire-fighting system consisting of a firewater loop line and two 3,000 gpm, 150 psig vertical can pumps, each with 50 percent capacity. The primary pump would be driven by an electric motor and the secondary pump would be driven by a diesel engine equipped with its own diesel fuel oil storage tank. Fire water for Tank Farm Site 2 would be provided through a connection to the LADWP water main.

E.4 Pipeline Design and Operation

Design. All pipelines would be designed in accordance with the latest edition of the ASME/ ANSI B31.4, "*Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia, and Alcohols*". The design, construction, operation, and maintenance of all pipelines are regulated by the DOT under Title 49 of the CFR, Chapter I, DOT, Part 195.

The applicant anticipates installing remotely operated mainline block valves at the beginning and end of each of the pipeline segments. Each valve would be monitored and controlled from a yet-to-be-determined, project related building.

Construction. All pipelines would be installed belowground, with the exception of the water crossings at the Pier 400 causeway bridge, at the pig receiving and launching station, at the Valero pipe bridge that crosses the Dominguez Channel west of the Ultramar/Valero Refinery, and within parts of the Marine Terminal and Tank Farm Sites. Conventional trenching of the pipelines would occur at Pier 400, across Navy Way, and at the pig launching areas. In other locations, boring and drilling would be the primary method of placing the pipelines underground.

All field welding would be performed by welders to the applicant's specifications and in accordance with all applicable ordinances, rules, and regulations, including API 1104 (Standard for Welding Pipe Lines and Related Facilities) and the rules and regulations of the DOT found in CFR Title 49 (Part 195 for liquid pipelines). As a safety precaution, a minimum of one 20-pound dry chemical unit fire extinguisher would accompany each welding truck on the job.

Operations. The pipeline safety system would rely upon a Supervisory Control and Data Acquisition (SCADA) system, which would gather data from remote points for use by automatic controls and safety systems. In general, the SCADA system would provide continuous real-time operational data, including product-specific information, such as temperature and gravity; and operational information, such as pressure and flow rates. Information available through the SCADA system would also include security system status, intrusion detection alarms, remote video camera pictures, fire-fighting system status and alarms, and other facility status points. The SCADA system would provide the pipeline controllers with the ability to remotely control systems operation and respond to alarms that are initiated when operating conditions fall outside established parameters. Upon detection of an irregularity, the pipeline system controllers would have the capability to shut down the affected terminal equipment or pipeline by remotely stopping pumps and closing block valves. Pressure control valves, pressure measuring devices, and pressure relief valves would protect the pipelines.

A pipeline leak detection system would be installed to provide constant monitoring of pressure and flow. Flow or pressure deviations would be analyzed by the leak detection system and an alarm would be sounded should any reported deviations exceed pre-set parameters. The pipeline routes would be visually inspected at least biweekly by line rider patrol in accordance with DOT requirements (49 CFR Part 195) to spot third-party construction or other factors that might threaten the integrity of the pipelines. Inspection of highway, utility, and pipeline crossing locations would be conducted in accordance with state and federal regulations. Pipelines would be inspected annually at all test locations, quarterly at control points, and more than quarterly at cathodic protection systems to ensure corrosion control. Cleaning and inspection viable mechanical “pigs” would be conducted in accordance with DOT regulations.

System inspection and maintenance of the pipelines would include periodic hydrostatic testing to check for pipeline leakage and mechanical integrity under pressure, as required by DOT. The tests would involve filling the pipelines with water or other fluid and increasing the pressure by means of a pump equivalent to 125 percent of the maximum allowable operating pressure (MAOP) for a period of at least 4 hours. Following the 4-hour test, the pressure would be reduced to 110 percent of MAOP and held for at least 4 additional hours. Following the test, the water would either be transferred to the next pipeline section or discharged into an existing storm drain with the prior approval of the LARWQCB.

All pipeline valves would be inspected and maintained in accordance with the standards promulgated in Title 49 of the CFR, Chapter I, DOT, Part 195, Section 195.420 – Valve Maintenance. In-line block valves would be cycled and inspected twice annually, not to exceed 7 months between inspections, to ensure proper operation.

The cathodic protection system designed for the pipelines would consist of rectifiers, buried anodes, and test stations along the pipelines and within the Marine Terminal and tank farms. The cathodic protection system would be designed and installed within 1 year after completion of Project construction. The design basis requires knowledge of the steady state potential along all parts of the pipeline system, which can only be determined after the system is in operation for an extended period. Once these data are obtained, the system components would be designed and installed.

Once in operation, rectifiers would be checked six times annually, not to exceed 2.5 months between inspections, to ensure they are operating properly. Quarterly, voltage and current readings would be recorded for each rectifier; voltage readings at important test stations throughout the system are measured and recorded. Annually, voltage reading at all test stations would be measured and recorded; if data indicated that potential problems areas existed on the pipeline, voltage readings would be taken throughout the suspect areas using a technique called a close interval survey. Adjustments would be made to the system whenever test data indicated that voltage levels were outside the design limits

The applicant subscribes to the Underground Service Alert “one call” system that would provide a single toll-free number for contractors and individuals to call prior to digging in the vicinity of any pipeline. Upon notification that a contractor or property owner intended to dig in the vicinity of a pipeline, the applicant would mark the horizontal location of the pipeline. Marking would be provided within 48 hours of request. Additionally, a warning tape with the pipeline name would be buried approximately 18 inches (46 cm) above the new pipelines.

E.5 Security

The proposed Project would be designed to meet federal, state and local security requirements, including compliance with the USCG requirements, as the primary regulatory authority over the security, design and operational parameters of the Marine Terminal; the Marine Transportation Security Act passed in 2002; 33 CFR 105; the International Ship and Port Facility Code as adopted by the International Maritime Organization; and regulations of the CSLC. Pacific Los Angeles Marine Terminal, LLC (PLAMT) has developed and submitted for approval a Facilities Assessment Plan and a Facilities Security Plan; both plans have been approved by the above agencies.

As part of the detailed design process, approved standards for minimum emergency equipment access would be applied to ensure adequate emergency access and exit throughout the Marine Terminal and tank farm sites. This would assure that adequate roadway width, turning radii, and staging areas for emergency equipment are provided.

The Marine Terminal and tank farm sites would be secure areas that would require traveling though a gate that is controlled and opened remotely by plant personnel. The Marine Terminal would also have a guard check-in building that would be occupied 24 hours a day 365 days a year. All visitors to any of the Project sites would be required to first be cleared for entry to the Marine Terminal site by the guard. Visitors would then report to the administration building to sign-in and receive permission to proceed to any other site or part of the facility.

The Marine Terminal and all tank farms would have perimeter security barriers/fences around the entire property areas (with the exception of the ocean-side working face areas). The security plan for the Project, including description of hardware and procedures, would be developed to meet federal, state, and city laws and regulations. The plan's design would include local and remote monitoring systems, equipment systems, terminal personnel training programs, and emergency response. The security plan would be in accordance with The Maritime Transportation Security Act of 2002 (46 CFR 701) and 33 CFR 101-106. The plan would be approved by the U.S. Coast Guard in collaboration with local Port of Los Angeles (Port) and police authorities. In order to maintain security, the specifics of the plans would not be released to the public.

E.6 General Marine Oil Terminal Lease Conditions

The Property Management Division and the Environmental Management Division of the Los Angeles Harbor Department (LAHD) have established conditions to be applied to all new and renewed marine oil terminal leases, including the proposed Project. Lease conditions for the proposed Project would be consistent with the Port's leasing practices described in Section 1.6.3 and Leasing Policy Directive No. 2. These include provisions for the inspection, control, and cleanup of leaks from aboveground tank and pipeline sources, as well as requirements related to groundwater and soil remediation. Certain elements of these lease provisions are described below:

- Aboveground tanks must be inspected at least every 5 years (internal inspection of the tank bottoms) starting after the first 10 years of service.
- In cases of contamination involving multi-user pipeline rights-of-way, the pipeline tenants will form a collective under LAHD supervision to assess, characterize, and prepare a remedial action plan for the affected right-of-way; tenants will individually perform hydrostatic tests on pipelines within the right-of-way and make the necessary repairs or replacements; and the tenant collective will contract to remediate the contamination using methodology, and within a schedule, acceptable to the LAHD.
- In the event of groundwater contamination, groundwater recovery must begin immediately upon identification of free product on the groundwater. At the boundary of the lease-hold, adequate control systems must be installed to prevent migration of any contamination off-site. The LAHD must approve tenant recovery plans prior to recovery operations. Recovery operations must continue throughout the term of the lease or until further recovery is infeasible, whichever is later. Remediation must be complete by the end of the term of occupancy. In circumstances where groundwater remediation is not complete by the term of the permit, the tenant must continue to remediate the site until clean-up is considered complete. In addition to LAHD approval, the tenant must obtain regulatory agency approval for groundwater remediation.
- In the event of soil contamination, remediation of accessible soils must begin immediately upon completion of a source control program. All soil is to be remediated by the end of the term of occupancy. The LAHD must approve remediation plans prior to initiation of remediation activities. Not more than five years, or less than three years, prior to lease expiration, notification will be made by the LAHD whether or not a new lease will be considered. Facility decommissioning and site remediation must begin immediately if lease will not be renewed. Holdover occupancy will result in increased rental rates and financial liability. This funding is paid to reimburse the LAHD for its costs to prepare the environmental documents. In addition to LAHD approval, the tenant must obtain regulatory agency approval for soil remediation.

In addition to the provisions outlined above, the lease would also stipulate that:

- Accelerometers (seismic sensors) must be installed on the deck of the unloading platform to measure structure response and displacement during earthquake events. This would aid the operator in determining if the structure exceeded design structural criteria and what level of pre-established inspection program should be implemented.
- Atmospheric and ocean conditions must be constantly monitored via anemometers, current meters and wave gages. This information would be integrated into the vessel load monitoring and unloading arm envelope alarm system.

- Oil spill booms must be deployed around the tanker during the entire cargo discharge period. Emergency spill response equipment would also be readily available. The marine facilities would be designed to the highest seismic criteria which would emphasize oil spill prevention (refer to MOTEMS).
- The terminal must incorporate landscaping elements to soften the industrial nature of the operation and to improve the visual appearance of the facility. The nature and extent of the landscaping would be defined in the preliminary design phase of the proposed Project.

E.7 References

California State Lands Commission (CSLC). 2004. Notice of Proposed Rulemaking, by California State Lands Commission, Regarding the 2001 California Building Code, California Code of Regulations, Title 24, Part 2, Marine Oil Terminals, Chapter 31F. http://www.slc.ca.gov/Division_Pages/MFD/MOTEMS/NOPR5-17-2004.doc.

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