Chevron

T.S. Bremner
Vice-President & Refinery Manager

Chevron Canada Ltd.
Head Office: 355 Burrard Street, Vancouver 1, B.C.
Refinery: 355 North Willingdon Avenue, Burnaby 2, B.C.

April 16, 1971

Mr. George H. Armson
Chief Public Health Inspector
The Corporation of the District of Burnaby
Municipal Hall
4949 Canada Way
Burnaby 2, B. C.

Dear Mr. Armson:

The following is relative to the environmental aspects of the Burnaby Refinery Modernization Project and is in addition to data supplied to the Director of Planning on March 24, 1971 when application for preliminary plan approval was made.

Installation of the Rheniformer is essential to our production of Unleaded or Low Lead Gasolines which are required as part of the automobile industry effort to reduce harmful emissions in automobile exhaust. As you know, a major contribution to the air pollution of urban areas results from automobile emissions.

The Rheniformer proposed for Burnaby Refinery is a low pressure unit which has been developed by the Chevron Research Company. Similar units are being installed at Richmond, California; El Paso, Texas; Pascagoula, Mississippi; and St. John, New Brunswick as part of a company wide program to meet the requirements of 1971 and later model automobiles. These units are all built to the same mechanical specifications as those of the first Rheniformer which commenced operation at the Los Angeles Refinery in January of 1970.

The Depropanizer and Light Ends Recovery facility will permit improved recovery of Propanes and Butanes by upgrading the process efficiency of our existing Polymerization Plant which produces motor gasoline blending stock from these components. The net effect of this improvement will be to reduce the volume of surplus light ends which are being burned at the refinery flare on an intermittent basis.

The refinery flare is being replaced with a new unit which is similar in design to those recently installed at Los Angeles, California and Salt Lake City, Utah. The

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advantages of this John Zink Model are improved steam injection tubes which permit smokeless operation at significantly lower noise levels under normal conditions and in addition the pulsation in flame size will be reduced by an improved seal system. The major aspects of this improved flare design were reported to the Municipal Pollution Committee on November 3, 1970. A copy of this report is attached. The cost of this new relief system is estimated at $200,000.

Considerable design effort has been devoted to noise control and a copy of our Specification No. E-2791-B is attached.

All hydrocarbon emissions from these facilities during both normal operation and emergencies are routed to the refinery flare.

Water effluents, which are minimal, will be routed to the refinery API Oil-water separator, and will replace those of the present Catalytic Reformer which will be shutdown upon completion of this Modernization project.

Additional steam generating capability is required for the new process equipment. As a result a Carbon Monoxide (CO) Boiler will be installed at the Fluid Catalytic Cracking Unit. This boiler will be partially fired with the CO rich Cracker flue gas which is presently going directly to the atmosphere. The air pollution abatement advantages of this CO Boiler result from removal of CO and entrained hydrocarbons from the flue gas. The cost premium to install a CO rather than a conventional boiler is estimated at $500,000.

We will be pleased to provide any additional information that you require.

Yours very truly,

T. S. BRENNER

Attach.

November 3, 1970

Standard Oil Refinery Flare
File: 321.11

Mr. B. Lecho, Secretary
Pollution Committee
The Corporation of the District of Burnaby
4949 Canada Way
Burnaby 2, B. C.

Dear Mr. Leche:

Please refer to your letter of October 20, 1970 regarding the efficiency of the refinery flare.

We have been investigating means of improving the efficiency of our flare system and plan on installing modifications similar to the ones installed several months ago at our Salt Lake Refinery. The attached letter from the Chief Engineer of that facility indicates the type of improvement which was obtained.

In addition we are working on plans for process improvements which will reduce the production of light hydrocarbons. This will result in less product being flared especially during periods such as encountered this year when work stoppages, slowdowns, and economic conditions seriously upset demand and ability to ship.

To install the modifications to both the process and flare systems will require a complete refinery shutdown. When our plans are finalized we will advise you further on details and completion date.

Yours very truly,

T. S. BREMNER

TSB:ah
Attach.
cc. Mr. G. B. McLean

MANAGER'S OFFICE

CHEVRON OIL COMPANY
WESTERN DIVISION
2351 N. 10TH WEST P. O. BOX 117 SALT LAKE CITY UTAH 84110

SALT LAKE REFINERY

October 19, 1970

Salt Lake Refinery
Flare Installation
321.11

Mr. J. A. Robinson
Standard Oil Company of
British Columbia
833 Marine Bldg.
Vancouver 1, British Columbia

Dear Mr. Robinson:

In accordance with your request of September 25 I've enclosed drawings of our recently installed flare system. The red pencil comments added to these prints reflect after-the-fact design considerations.

We feel that our installation has performed quite satisfactorily, particularly with respect to public relations. What had been a relatively large, visible flame at normal purge rates is no longer visible (during the day) with the new equipment. A blue "Bunsen Burner" flame is visible at night.

Installation of the steam control instrumentation has been delayed due to a variety of problems. Because the flare can not be observed from the area control house, control of steam for smoke control presented a problem. A closed circuit television (CCTV) system was installed to permit necessary observation. The CCTV has been highly successful. I feel that it is a sufficient enough means of observation to make automatic proportioning controls unnecessary.

The flare tip is the latest design, John Zink Model STF-SA-24S. The principle advantages of this model appear to be in the use of steam-air injection tubes and in noise control advances. The molecular seal is also a John Zink standard design.

The only significant operating problem with this unit occurred when a cast iron strainer body (the strainers were removed) on the pilot gas inlet cracked. The leaking gas ignited resulting in a fire approximately 6 feet below the tip outlet. This was corrected by using the ignitor system for pilot flame. I would recommend running individual ignitor and/or pilot lines to grades and removing the strainers (including cast iron body) or locating them at grade.

We hope this information will be of assistance to you. Should you have further questions please call Mr. D. H. Gleason or myself.

Very truly yours,

P. G. Snyder

P. G. Snyder
Chief Engineer

ENGINEER'S REPORT

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SPECIFICATION NO. E-2791-B

NOISE CONTROL

1. GENERAL

This Specification covers the noise control measures required to ensure that noise emitted from new plant facilities will cause a minimum disturbance to COMPANY'S neighbors in the vicinity of the plant and will be below the standards established by COMPANY for employees working within the plant.

2. FURNACES

Furnace noise at any location 3 ft. from the furnace with all burners firing shall be limited to 82 dBA by the following method, or an equivalent method approved in writing by COMPANY'S Design Representative:

All burner registers shall be completely enclosed in plenum chamber(s) with the following minimum requirements:

Fabricate of 10 BWG plate.

Undercoat with sound-deadening material.

Line with 3 in. of 6 lb. per cu. ft. fiber glass.

Retain fiber glass with expanded metal screen.

If oil-fired, provide adequate means of inspecting for and drainage of oil leaks. Omit fiber glass lining where drips collect.

All combustion air, both primary and secondary, shall be taken from the plenum chamber. There shall be no line-of-sight from the burner to the outside. Lined baffle(s) shall be used to provide at least 2 turns of the incoming air.

Handholes, penetrations for external air register control, oil gun, etc., shall be well sealed.

External walls shall be constructed such that vibration and noise generation is minimized.

If forced draft or air preheat systems are employed, the duct work shall be damped and lined (with high temperature materials as necessary), and the fans baffled, as necessary to achieve the noise limitation given above.

3. AIR-COOLED HEAT EXCHANGERS

Air-cooled heat exchanger noise with all fans on at any location 3 ft. below the tubes for induced draft units, or 3 ft. below the fans for forced draft units, shall be limited to 82 dBA by use of the following limitations, or an equivalent method approved in writing by COMPANY'S Design Representative:

Air side designs shall be limited as follows:

Fan motor rating - 15 hp or less.

Tip speed - 10,000 fpm or less.

6-bladed fans, tip and hub seals shall be used.

8-BWG transition plenums, flat panels shall be adequately damped or stiffened, no gaps.

4. LARGE ELECTRIC MOTORS

Large motor noise at any location 3 ft. from motor shall be limited to 85 dBA by the following method, or an equivalent method approved in writing by COMPANY'S Design Representative:

TEFC (3600 RPM - 40 hp and over; 1800 rpm - 100 hp and over) - unidirectional fans and higher temperature insulation requiring less air flow shall be used.

WP II - baffles shall be used on and sound deadening material applied to the inside of the WP enclosure.

5. LARGE COMPRESSORS

Large compressor noise at any location 3 ft. from discharge piping shall be limited to 90 dBA by the following method, or an equivalent method approved in writing by COMPANY'S Design Representative:

Discharge piping shall be lagged from outlet flange to discharge vessel on compressors 1000 hp and larger as follows:

Wrap with 3-in. of 6 lb. per cu. ft. fiber glass.

Cover with 24-gage galvanized steel secured by bands.

There shall be no mechanical connection between cover and pipe or flanges.

Pipe supports shall be designed to accommodate lagging.

Use of high pressure axial compressors (H-AXI) should be avoided. If used, complete acoustical enclosure is required.

Use of speed changers should be avoided. If used, housing shall be thoroughly damped or enclosed.

6. PIPE FLOW

Pipe flow noise at any location 3 ft. from piping shall be limited to 85 dBA by the following method, or an equivalent method approved in writing by COMPANY'S Design Representative:

Flow in pipes shall be limited as follows:

Gases - V=100 sp. vol. or less (V, fps; sp. vol., cu.ft. per lb.)

Liquids - 30 fps or less.

7. PRESSURE REDUCING VALVES (GAS)

Pressure reducing valve noise at any location 3 ft. from valve discharge shall be limited to 90 dBA by the following method, or an equivalent method approved in writing by COMPANY'S Design Representative:

For pressure ratios 2 or greater and mass flow rates 40,000 lb/hr or greater, valve design shall be used that limits trim velocity to Mach .33 or less based on upstream conditions.

8. ATMOSPHERIC VENTS, EXHAUSTS, INTAKES

Atmospheric vent, exhaust or intake noise at any location 3 ft. from discharge or intake (at 45 degrees from the vertical) shall be limited to 90 dBA by the following method, or an equivalent method approved in writing by COMPANY'S Design Representative:

Silencers shall be used on all continuous process vents, and vents used routinely on startup or shutdown; alternatively, a valve shall be used that meets the above requirement when exhausting directly to atmosphere.

Intake silencers shall be used on all air compressors and blowers.

Intake and exhaust silencers shall be used on all engines.

Gas turbine enclosures shall be used including intake and exhaust silencers.

9. EDUCTORS

Eductor noise at any location 3 ft. from eductors and downstream piping shall be limited to 90 dBA by the following method, or an equivalent method approved in writing by COMPANY'S Design Representative:

Inlet steam chest to discharge vessel shall be wrapped with 3 in. of 6 lb. per cu. ft. fiber glass. Wrapped portion shall then be covered with 24-gage galvanized steel secured by bands. There shall be no mechanical connection between cover and eductor, piping, or flanges.

10. FLARES

Continuous noise intrusion shall be avoided by limiting any continucus steam jet velocities to 500 fps.

Surging during flaring shall be avoided by using molecular seal or multi-ported, baffled seal drum.

THIS PAGE ENDS SPECIFICATION E-2791-B