



**SHELL  
REFINING**  
(AUSTRALIA) PTY. LTD.  
CLYDE REFINERY



*Marking the Opening by  
His Excellency the Governor of New South Wales,  
Lieutenant-General Sir Eric Woodward,  
K.C.M.G., C.B., C.B.E., D.S.O.,  
of major extensions to  
The Shell Refinery at Clyde.*

*19th March, 1959.*



## PROGRAMME OF EVENTS

- 2.45 p.m. Guests to be seated.
- 2.47 p.m. His Excellency the Governor of New South Wales, Lieutenant-General Sir Eric Woodward, K.C.M.G., C.B., C.B.E., D.S.O., arrives at Refinery.
- 2.59 p.m. His Excellency the Governor of New South Wales arrives at dais.

### NATIONAL ANTHEM.

- 3.00 p.m. Speech by Mr. J. R. C. Taylor, C.I.E., Chairman of Directors of The Shell Group of Companies in Australia.
- 3.08 p.m. Speech by His Excellency the Governor of New South Wales.
- 3.13 p.m. His Excellency the Governor of New South Wales performs the official opening ceremony.
- 3.15 p.m. Speech by Mr. T. A. Dent, Manager of Clyde Refinery.
- 3.23 p.m. His Excellency the Governor of New South Wales and official party withdraw to inspect Refinery.
- 3.28 p.m. Guests proceed on bus inspection of Refinery.
- 4.15 p.m. Cocktails in amenities area.
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## INTRODUCTION

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This booklet on Shell's Clyde Refinery describes briefly some of the techniques involved in transforming crude oil into finished products ready for the markets, and the arrangements for the distribution of these products to the consumer.

But first a short description of the Refinery and its role in Australia. The Refinery stands on a site which totals just over 235 acres. Its first plant, a Dubbs Cracker, commenced refining in 1928. Progressively since then other units have been added and old plant replaced.

Today Shell's multi-million pound Clyde Refinery, together with its sister Refinery at Geelong, Victoria, is able to supply one-third of Australia's petroleum needs.

Clyde Refinery's task is two-fold:

- To make Supershell and Shell Motor Spirits, Diesel Fuel, Power Kerosine, Fuel Oil, Special Solvents, Bituminous Products and Industrial Lubricants.
- To supply these products to a network of distribution points in New South Wales.

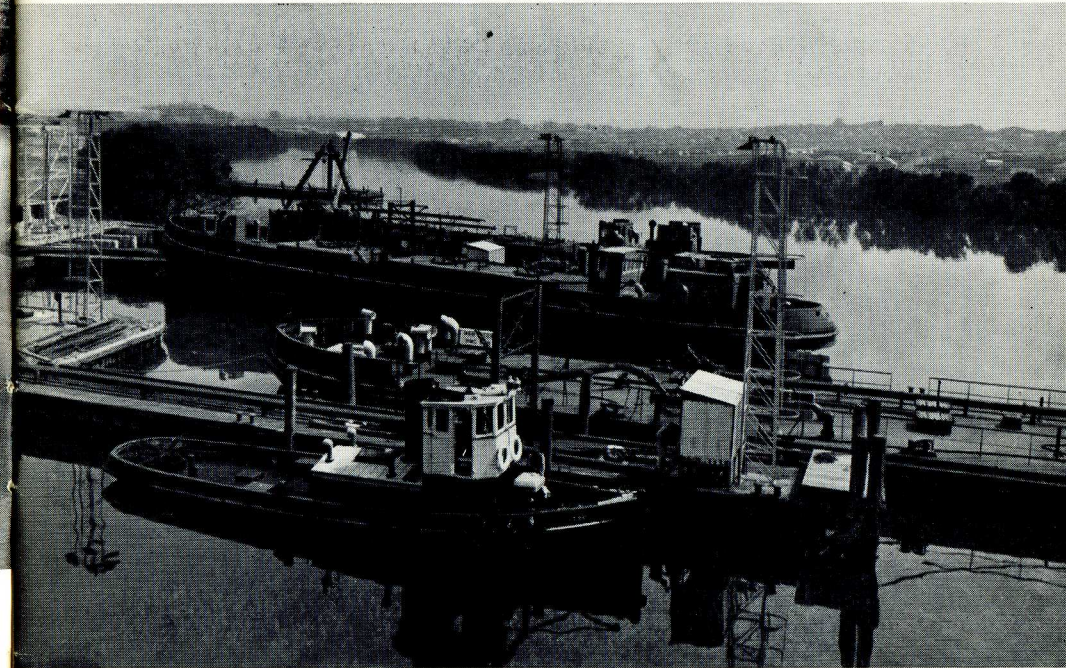
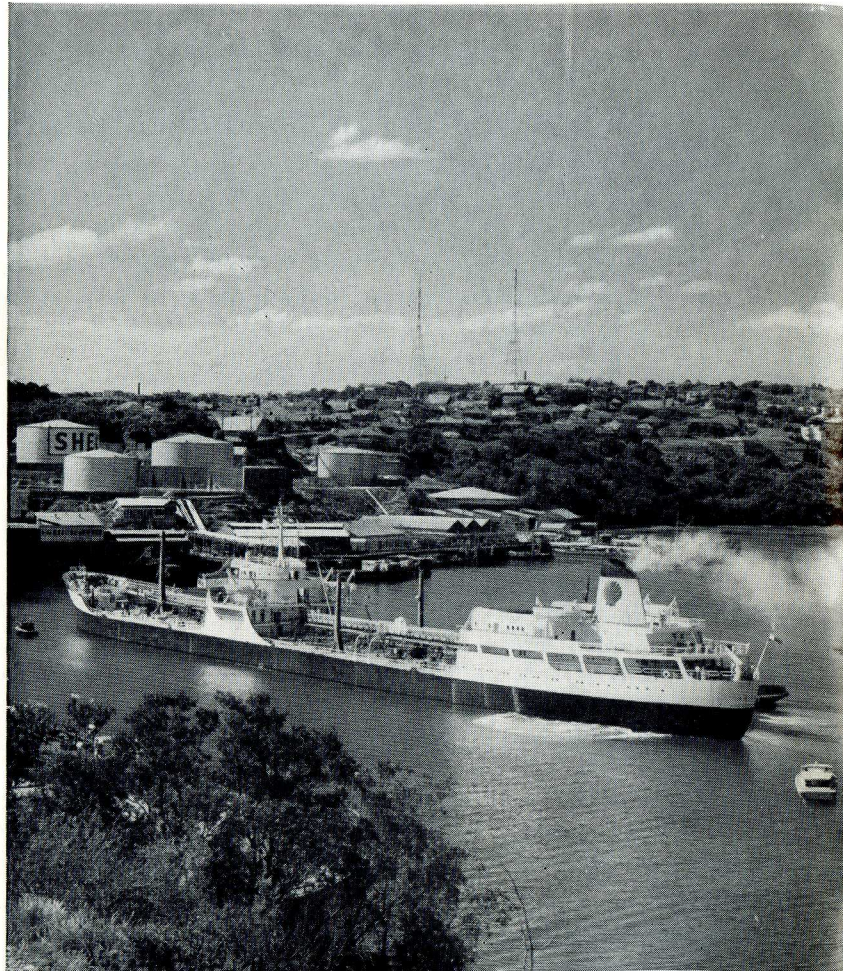


## THE CRUDE OIL ARRIVES

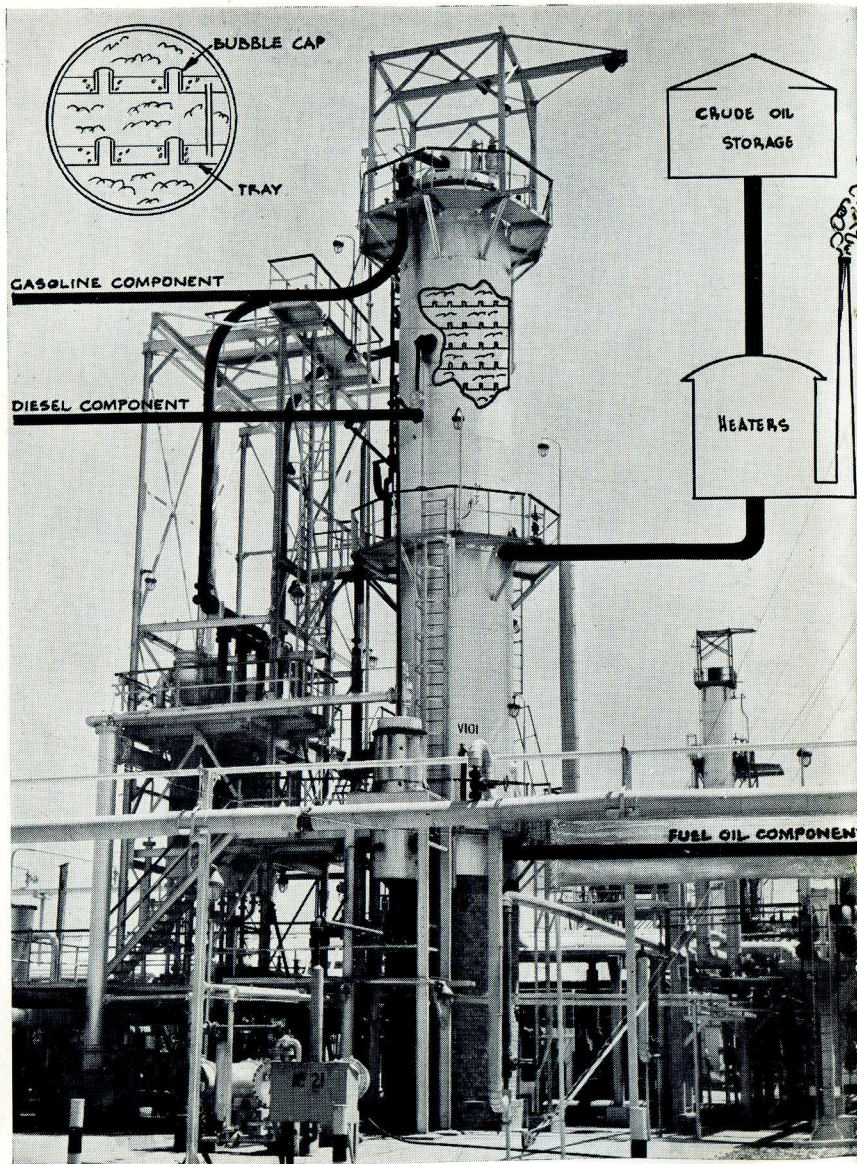
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Ocean tankers of the Shell fleet bring the crude oil for Clyde Refinery from overseas oilfields to Sydney and discharge their cargoes at Shell's Gore Bay ocean terminal.

From Gore Bay crude oil is transported by shallow draft barges up the Parramatta River to the Refinery's Parramatta River wharf for discharge into the crude oil storage tanks.







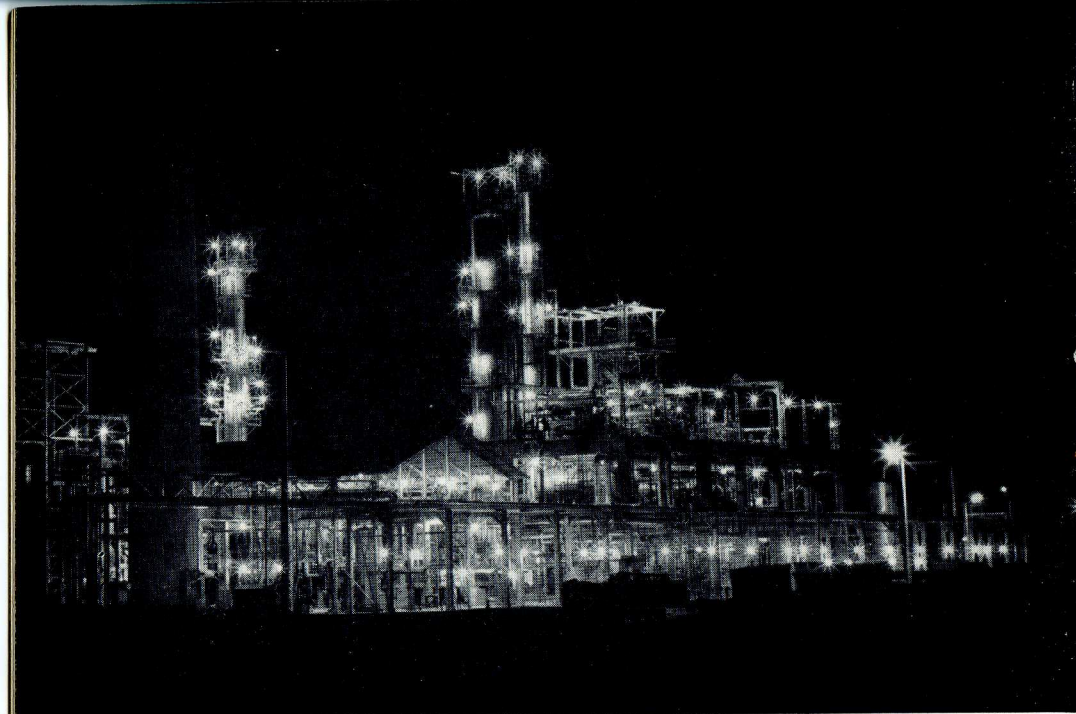
## THE CRUDE OIL DISTILLATION UNIT

The crude feedstock is transferred by pipeline from the storage tanks to the Crude Oil Distillation Unit. Processing in this plant separates the crude oil into base stock gasoline, diesel fuel and fuel oil.

First the crude is partly vapourised in the plant furnaces. It then passes to a fractionating column where splitting of the crude is achieved, various fractions condensing at different levels of the column according to their boiling points. The gasoline vapours are not condensed in the column but pass overhead whence they are subsequently condensed, cooled and sent to storage for further processing in the platformer.

Certain of the fractions condensing in the column are drawn off, cooled and run to storage for blending into finished products. The residue from the bottom of the column is fuel oil.





## THE PLATFORMER

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This unit receives its name from the promotion of a reforming process using a platinum catalyst.

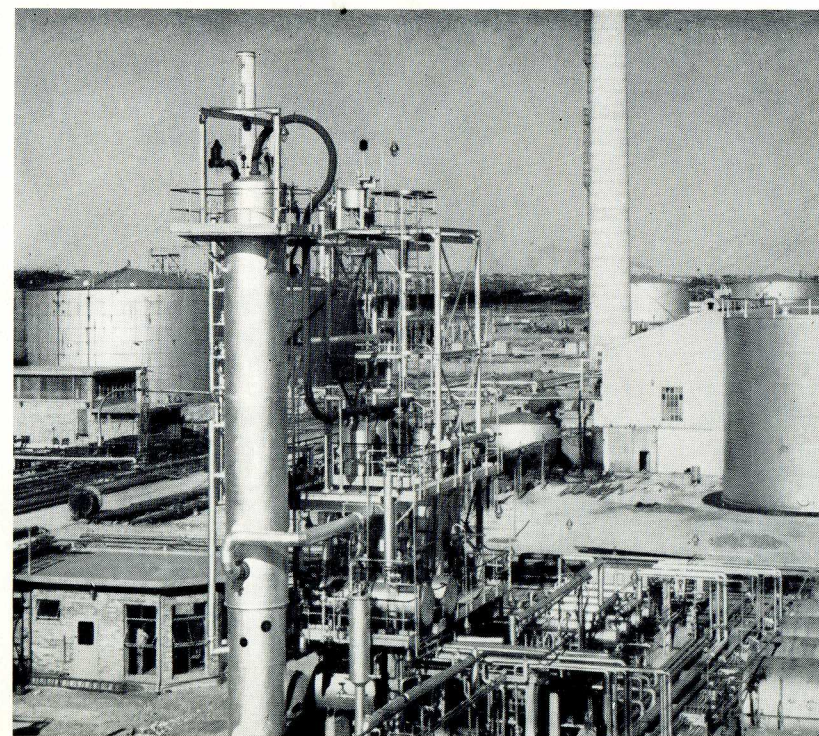
From a low octane rated gasoline feedstock from the Crude Oil Distillation Unit, the Platformer produces high octane component for subsequent blending, ensuring the Refinery's ability to supply high quality motor spirit. The reforming reaction is a chemical transformation carried out in specially designed reactors under high pressure and temperature in the presence of the platinum catalyst.

## THE SPECIAL BOILING POINT SPIRITS PLANT

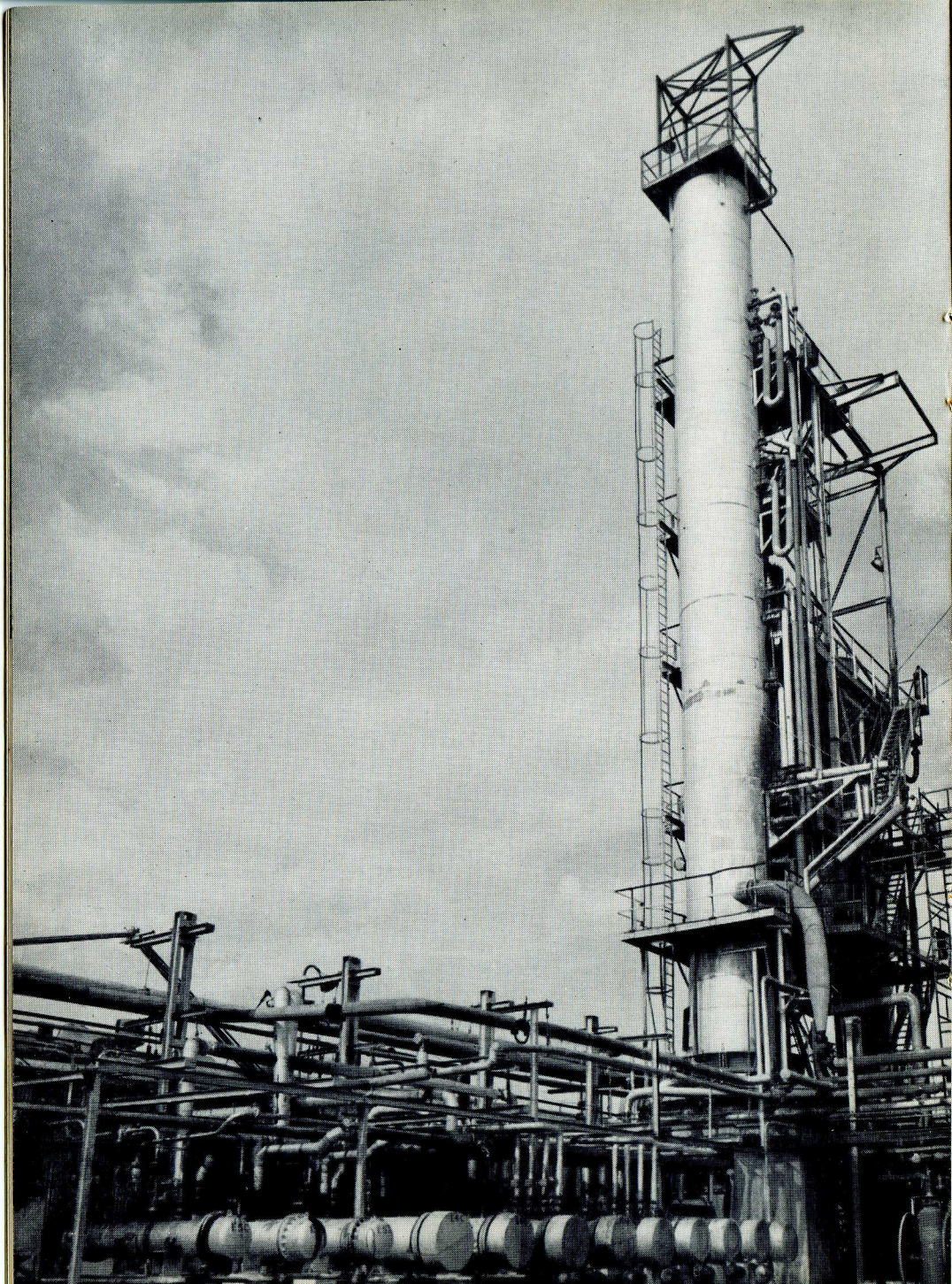
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A range of solvents is produced by this unit, varying from lighting and cleaning spirits to paint diluents used in industry. The feed is a straight run gasoline from the Crude Oil Distillation Unit or, alternatively, platformate.

The feed is heated by steam and passed through several fractionating columns from which the desired solvents are withdrawn through coolers or condensers to storage.







## THE VACUUM ASPHALT PLANT

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Here distillation of crude oil or residue is carried out under a vacuum, which causes vapourisation at a lower temperature than would be possible at normal atmospheric pressure.

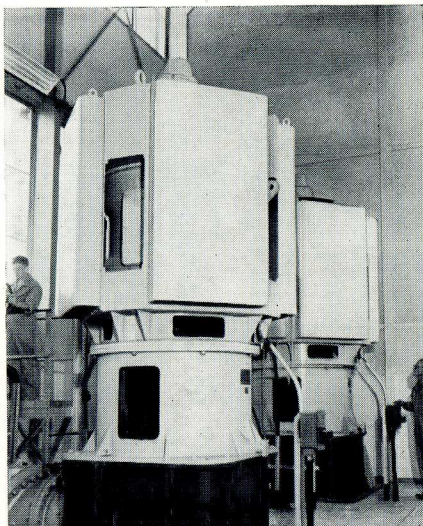
The plant produces diesel fuel from the top of the column. From three sections mid-way are obtained a light spindle oil, together with medium and heavy industrial machine oils, Straight run bitumen is produced from the bottom of the column.

By varying the operating techniques bitumens of varying degrees of hardness are obtained, while further treatment is given to bitumens demanding other qualities.

Straight run bitumen passed through a blowing column produces blown bitumen, and bituminous emulsions are obtained by emulsifying bitumen with a suitable soap solution.

Application of the various grades would be: straight run for roadmaking, the harder grades for industrial products such as bituminous paints, cables and inks; blown bitumen for the manufacture of laminated papers, battery boxes, and as a coating for bituminous felts. Straight run bitumens are applied hot and emulsions cold.





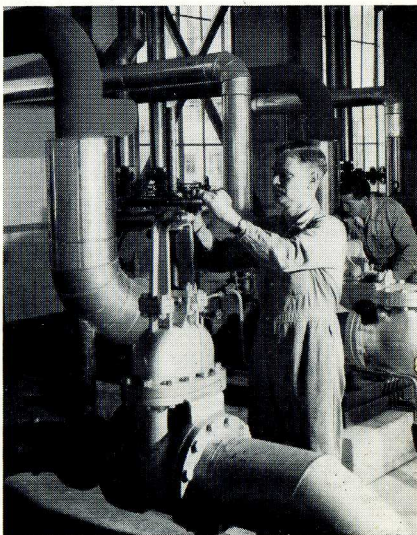
830 H.P. electric motors  
driving centrifugal pumps.



Main Interceptor



Mitchell Boiler Control Room



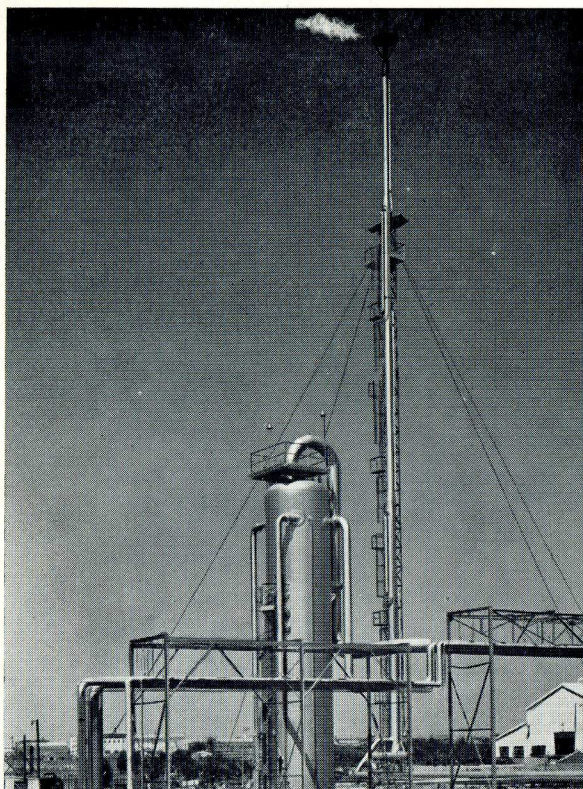
Utilities Pump Room

## UTILITIES

We have now traced the processes for transforming the crude oil into finished products. None of this would be possible without steam, cooling water, refinery fuel (oil and gas), compressed air and electricity. The Utilities Section can therefore be described as the heart of the Refinery, since it controls the flow of utilities to the various units.

- Salt cooling water is pumped from the Parramatta River through a 36" diameter pipeline, and returns, after circulation through the plant, via interceptors which ensure there is no contamination of the water returned to the river.
- High pressure super-heated steam is supplied to plant by five boilers, and to facilities for driving pumps and compressors. Heating by steam is also widely practised.
- Oil and moisture free air for the operation of hundreds of delicate control instruments and for pneumatic tools is supplied by several large compressors.
- Fuel oil and fuel gas from the plant are turned back to feed the boilers and plant furnaces.
- Electricity is purchased from the local Authority.





## THE FLARE

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The slight overflow of gas which is not used in the automatically controlled Refinery fuel gas system is burnt off in what is known as the Flare.

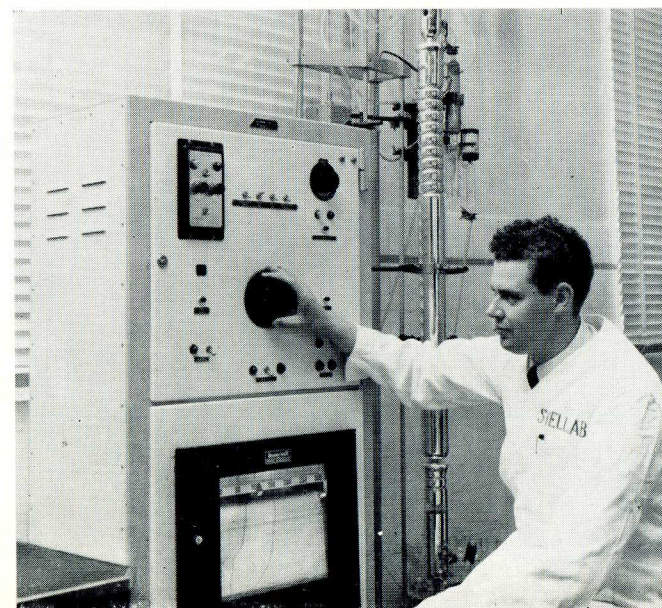
## THE LABORATORY

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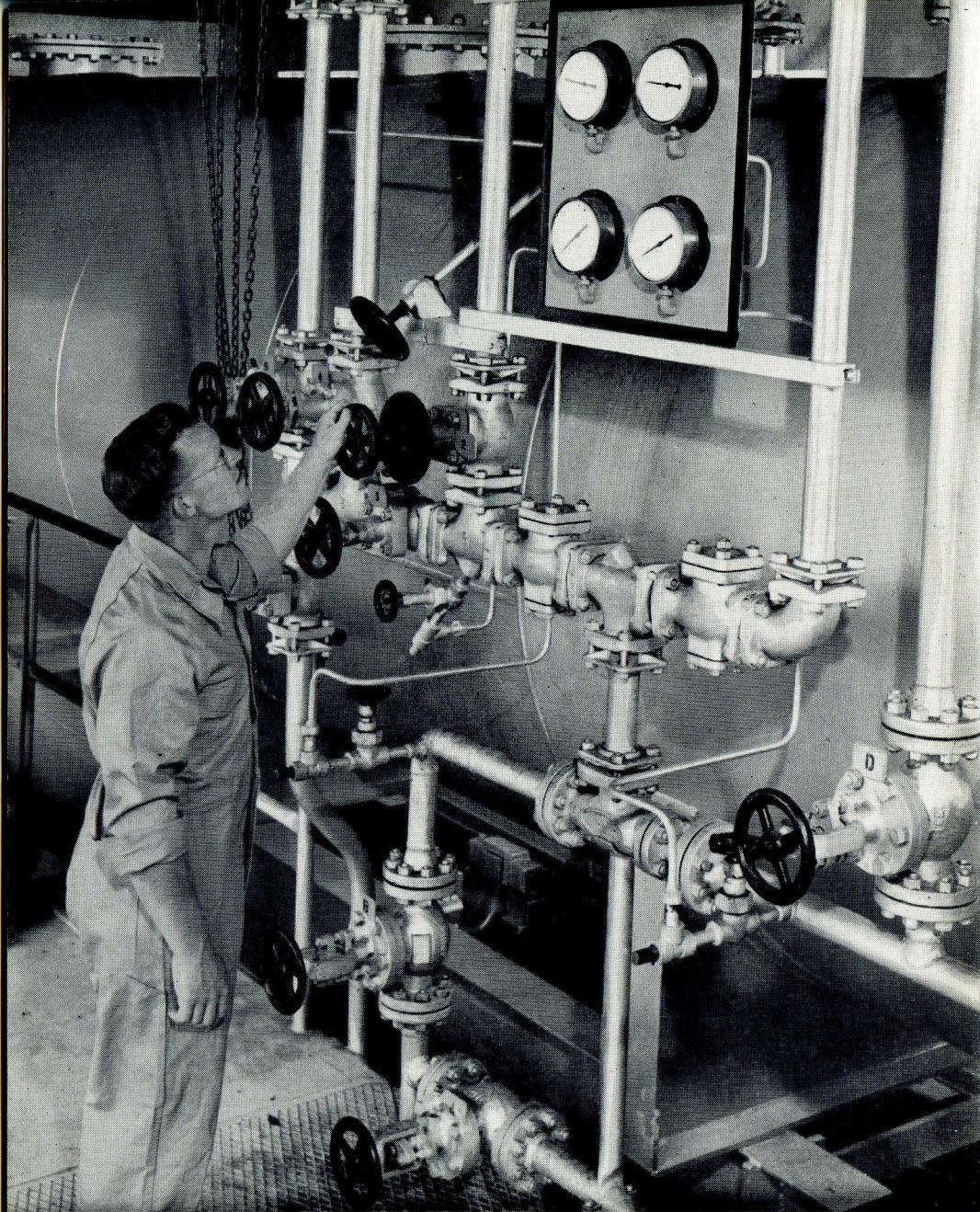
The Laboratory plays an important part in the routine testing of products during the various stages of the refining process. This is a continuous process, as the Refinery operates night and day. For this routine testing there is a Shift Laboratory.

Another section of the Laboratory concerns itself with the testing of finished products to ensure they conform strictly to specification. This ensures that only the highest quality products are marketed.

Technological investigations into plant problems are conducted in a third section of the Laboratory.







Tetra Ethyl Lead Blending

## BLENDING AND STORAGE

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Motor gasoline is, as we have seen, a blend of various components, and before the refined gasoline is pumped into the finished product tanks it is blended with a small quantity of tetra ethyl lead.

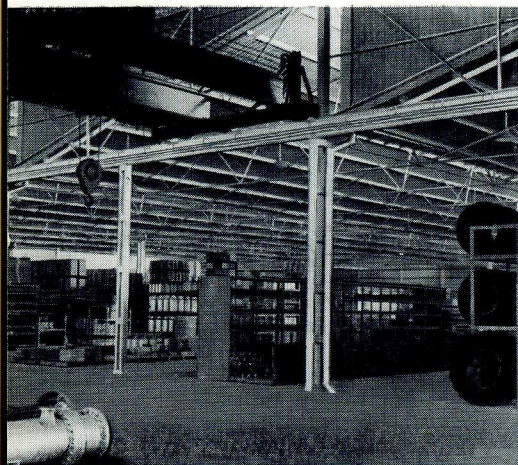
A T.E.L. Blending Plant is used for this purpose, which weighs accurately the correct amount to be pumped into the finished product tanks.

Finally, before delivery is made to the customer, Shell's exclusive and patented additive, I.C.A., is blended into both Shell and Supershell Motor Spirits.

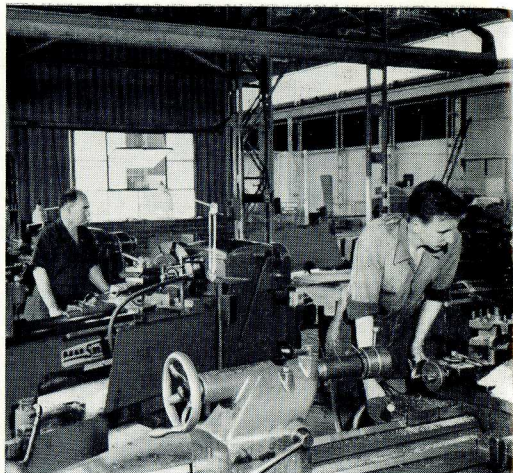
The crude oil, intermediate, and refined products are stored in tank farms. Some of the tanks are of the floating roof type, the roof rising and falling with the level of the product in the tank. This eliminates free gas space and minimizes fire hazard and loss by evaporation.



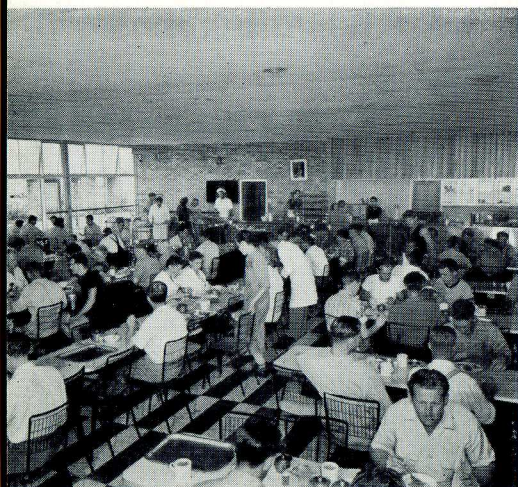




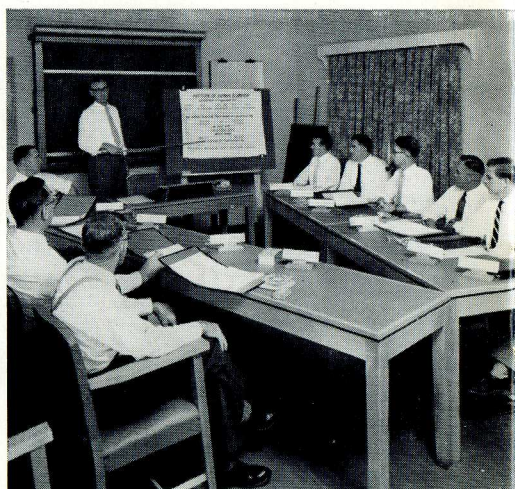
Main Warehouse



Workshops



Canteen



Training Centre

## ANCILLARY BUILDINGS

Our Refinery is complete with ancillary services. These include:

**Warehouse**—The Materials Warehouse is one of the most modern in the Southern Hemisphere, with electrical driven gantry for lifting heavy stores, and for storage of materials for use not only in the Refinery, but wherever Shell operates in New South Wales.

Comprehensively equipped workshops are manned by specialist engineers and artisans. Their responsibility covers an inspection service, maintenance and repair of Refinery equipment and plant.

Canteens are available for the use of employees and provide three-course meals at nominal cost.

Training courses for personnel at all levels are conducted by qualified training officers.

A medical centre of modern design, fully equipped to provide first-aid to employees incurring illness or injury on their jobs.

Offices, recreational facilities, and a library.

Change room facilities with individual lockers are available to each employee.

Fire Protection.





## CLYDE'S DISTRIBUTION ROLE

Look at a map of Sydney and New South Wales, and you will see that Clyde is ideally situated as a distribution centre. Road tankers are able to deliver with equal facility to either the north or south side of the Parramatta River. Clyde is Shell's road distribution point to all customers within the metropolitan area of Sydney. The same map will show that Clyde is a good railhead for intra-state deliveries and, in fact, serves places as far afield as Bourke and Cobar.

The rail tank cars seen are typical of those owned by Shell. They are loaded at the Refinery's filling gantries before being marshalled and shunted to the N.S.W. railway network. Filling is by pre-set meters, pumping stopping automatically when the gallonage set on the meter has been reached. The filling of road tankers is also controlled with pre-set meters.

In New South Wales Shell owns more than 50 country depots, each with its rail siding and storage tanks. Rail tank cars carry the product to the depot. From the depot they are in turn delivered to agents and service stations. It is through the country network of Shell depots, Shell agents and Shell dealers that customers, whether they be industrialists, motorists or primary producers, are kept supplied.

From 44 gallon drums to 4 oz. tins, packaged products are similarly delivered by road and rail.





## STATISTICS

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- A permanent complement of over 1,000 is needed to operate and maintain the Refinery and to distribute the products. These include chemical engineers, chemists, industrial engineers, fitters, turners, storemen, drivers and clerical staff.
- New construction and other developmental work has given employment to 1,200 people.
- The Refinery pumps 9 million gallons of salt water per day through the plant for cooling purposes.
- There are more than 60 major tanks with a total capacity of 40 million gallons to accommodate crude oil and products.
- Fire fighting personnel working on shifts provide day and night cover. A 10-ton gross weight foam tender is capable of delivering 4,000 gallons of foam per minute.
- The Warehouse provides 50,000 sq. ft. of storage space.
- The Refinery owns 133 rail tank cars and 86 motor delivery vehicles operating from Clyde.

## ACKNOWLEDGMENT

Principal Contractors for the Refinery.

### Civil and Mechanical Engineering

Werkspoor, N. V., Amsterdam  
Dutch Australian Contracting Co. Pty. Ltd., Melbourne  
Thiess Bros. Pty. Ltd., Sydney  
A. E. Goodwin Ltd., Sydney

### Architects

Buchan, Laird & Buchan, Melbourne

### Main Carriers

Moat-Owens Pty. Ltd.

### Principal Suppliers

Thompsons Castlemaine, Sydney  
Stewarts & Lloyds Distributors Pty. Ltd., Sydney  
A. J. Watt & Co. Pty. Ltd., Sydney  
Taubmans Industrial Coatings Pty. Ltd., Sydney  
Humes Ltd., Sydney  
Luke Muras Ltd., Sydney  
Steelweld (N.S.W.) Pty. Ltd., Sydney  
Bernard Smith Pty. Ltd., Sydney  
W. E. Smith Engineering Pty. Ltd., Sydney  
The English Electric Co. Ltd., Sydney  
Australian Aluminium Pty. Ltd., Sydney  
The Commonwealth Industrial Gases Ltd., Sydney  
Foxall Instruments Pty. Ltd., Sydney  
Permutit Co. of Australia Pty. Ltd., Sydney  
E. A. Marr & Sons Pty. Ltd., Sydney  
A. Reyrolle & Co. Ltd., Sydney  
Blue Metal & Gravel Pty. Ltd., Sydney

Together with a great number of other consultants, engineers, contractors, sub-contractors and suppliers.





The standard of living of a country can be measured in terms of its industrial, commercial and personal demand for petroleum products.

We in Australia enjoy one of the highest standards in the world today, and in the years ahead our living standards will continue to rise.

Rebuilt Clyde Refinery epitomises our Company's faith in our Nation's future.

Shell sells a far greater volume of petroleum products than any other oil company in Australia. It intends to hold this position, and the orderly expansion of Clyde Refinery is designed to this end.

We hope you have enjoyed your visit and that you take away with you a feeling of confidence in our slogan:

**YOU CAN BE SURE OF SHELL.**



