(12)

3223

~~1005-97~~ ~~CFT~~ 5417/123

Copy No. 26

CONFIDENTIAL

DEPARTMENT OF JUSTICE

WAR DIVISION

ECONOMIC WARFARE SECTION

REPORT ON

OXYGEN PLANT AT SINGAPORE

October 2, 1943

Submitted by: Harry Conover,
Economic Warfare Section,
Department of Justice,
Washington, D.C.

3223

Economic Warfare Section,
War Division,
Department of Justice,
Washington, D. C.

Confidential Report,
October 2, 1943.
Re: Oxygen Plant at Singapore.
Submitted by: Harry Conover,
Economic Warfare Section,
Department of Justice,
Washington, D. C.

SIGNIFICANCE

The largest oxygen plant in the Straits Settlements is located in Singapore.[1/] It was operated by the Far Eastern Oxygen and Acetylene Company, a subsidiary of L'Air Liquide of Paris. It had a capacity of 50 cubic meters of oxygen per hour. Oxygen is of primary importance for welding and cutting, and the major portion of the output of this plant was used in the shipyards of Singapore Harbor. Some of the oxygen was also used at the Singapore flying field both for welding and repair work, and in its pure state in oxygen tanks to permit high altitude flying. It is estimated that it would require in normal times between six and nine months to construct a similar plant at this site. In view of the circumstance that there are no manufacturing facilities in the Far East to produce the type of equipment needed in an oxygen plant, this estimate of time required for replacement is further modified by the shipping facilities presently available to the Japanese who do have the necessary fabricating facilities. Because it is impossible to store large amounts of oxygen, the destruction of this plant would immediately impede ship repair work at Singapore for at least a six-month period.

The plant also produced small quantities of acetylene which were used in conjunction with oxygen for welding and cutting operations, and carbondioxide which may be used as a refrigerant and in fire extinguishers.

LOCATION

The plant is located at 851 Pasir Panjang Road. It is five miles west of the center of the city (the post office). On this road it lies between two large industrial plants: The Alexandre Brick Works and the Singapore Rubber Works. The Brick Works lie approximately 300 yards east and are surrounded by large quarries of pink earth. The Rubber Works lie approximately 200 yards to the west. These two industrial establishments are essential points of reference for the location of the oxygen plant because the latter, as all oxygen plants, is a comparatively small establishment and its location in this instance is further complicated by the circumstance that it is surrounded by a wooded area. The Pasir Panjang Road follows the coast along

---

1/ The only other plant is on the grounds of the Singapore Shipbuilding Co. This plant was incapable of supplying all the demands of that company even in peacetime.

the Strait of Singapore to the city. It is a bluish gray asphalt road, three cars wide. The oxygen plant is set back from this road approximately 150 feet to the north.

CONSTRUCTION AND LAYOUT

A sketch showing the layout of the works is attached hereto as Exhibit 1. As suggested by this sketch, all of the manufacturing operations are carried on in one building. This is a reinforced concrete structure approximately 20 meters wide, 35 meters long, and 25 feet high. It has a red peaked roof made of corrugated iron. Extending out from the slope on the northern side of this roof over the carbondioxide unit is a tank similar to a water tower. This roof tank is approximately 7 meters in diameter and 10 feet in height.

EQUIPMENT

The oxygen unit is of the standard L'Air Liquide design; a typical layout of this type is attached as Exhibit 2. Essentially this consists of a tube which may be of any cheap metallic construction, approximately 1 foot in diameter extending from the roof to the ground floor, designed to draw in air. This air is passed through desiccators where it is purified; thence it passes into the critical equipment, the oxygen column. This column into which the air is fed under pressure at the rate of 400 cubic meters an hour is of the same type of construction as liquifaction columns used in nitrogen plants. It consists of a copper tube approximately 1/8" in thickness, 2 feet in diameter, and 25 feet in height. Half of the column is ordinarily set below the floor level. Into this column are packed approximately 40 copper perforated circular plates. The column is hammered into shape by hand because there do not exist in any country mechanical means for making copper tubing of such a wide circumference. Each of the copper rings is packed by hand. In consequence, a high degree of skill on the part of the coppersmiths is required. This has always been one of the most important factors limiting the rate of production of oxygen equipment. In this country and in Canada it presently requires approximately four months to construct an oxygen column.

Auxiliary equipment includes air and oxygen compressors, but these are of the small popular types and do not constitute any conceivable bottleneck in the Japanese or Far Eastern economy.

The acetylene equipment is relatively simple. It merely involves an iron vat in which calcium carbide is deposited and upon which water is run, yielding the acetylene gas which is siphoned off in ordinary steel piping.

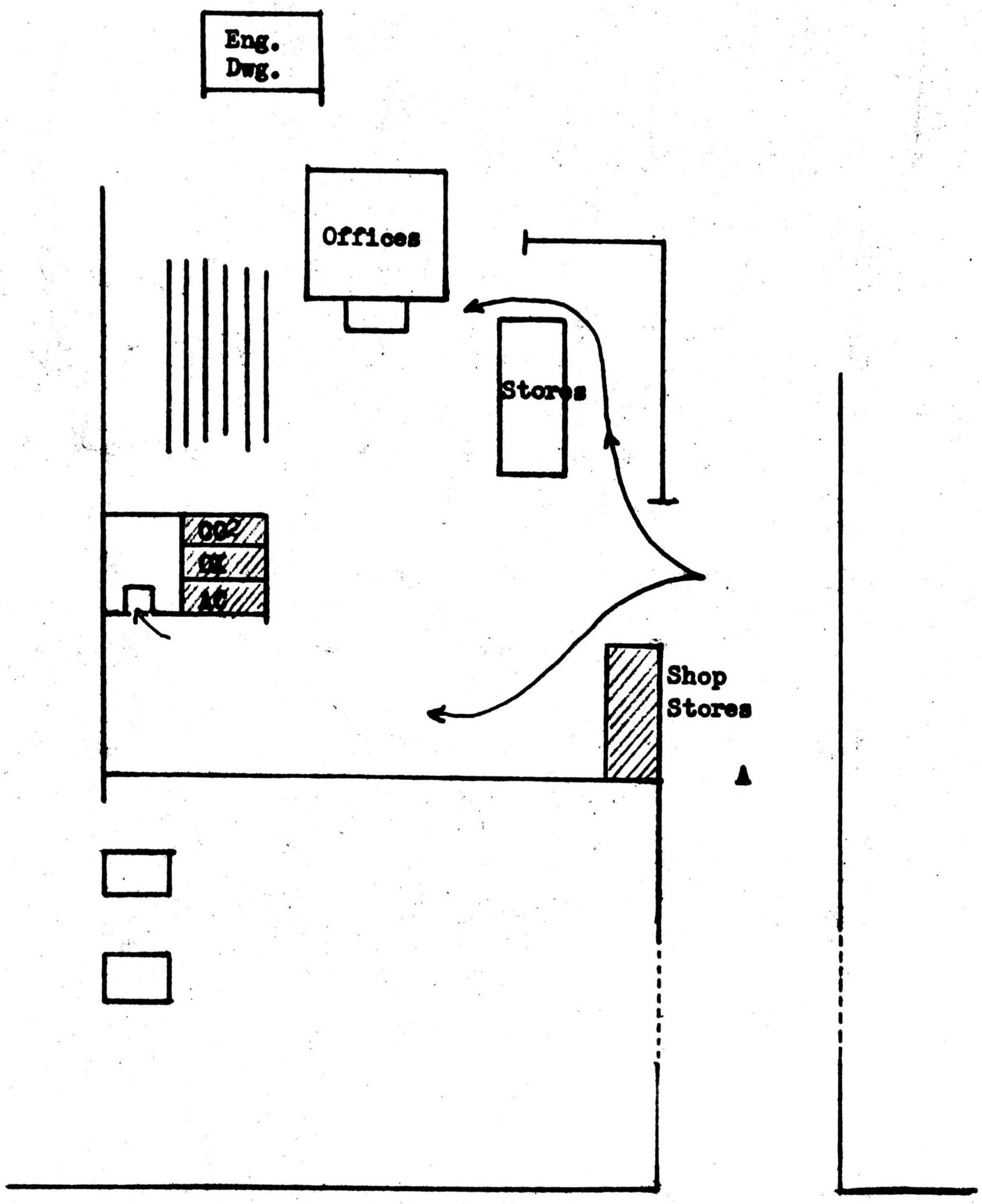
SUPPLIES

Electricity for the plant was obtained from the power station in Singapore; coal was brought from Haiphong; the calcium carbide came from France and Italy, and in 1941, from Tasmania.

The plant had a stock of standard steel oxygen cylinders to convey by means of truck the oxygen to its customers. This stock as in most oxygen plants must be turned over in the course of a week. No plant can afford the investment required for a larger stock. Not even a gasometer can normally hold more than a day's output of an oxygen plant.

SOURCE

Mr. J. Maucorps, L'Air Liquide Society, 1111 Beaver Hall Hill Road, Montreal, Canada. He served as director of the Singapore and Penang plants of L'Air Liquide until two days prior to the fall of Singapore.


Eng.
Dwg.
Offices
Stores
Shop
Stores
Pasir Panjang Road

SALLE DE FABRICATION OXYGENE

SALLE DE FABRICATION

SALLE DE REMPLISSAGE ET D'EXPEDITION DES CYLINDRES

-MAGASIN DE FABRICATION-

SALLE DE TOILETTE

-BUREAU-

-COUPE AA-

-LEGENDE-

CANALISATION D'AIR	M. P.
CANALISATION D'AIR	H. P.
CANALISATION D'OXYGENE	B. P.
CANALISATION D'OXYGENE	H. P.
CANALISATION D'HYDROGENE	B. P.
CANALISATION D'HYDROGENE	H. P.
CANALISATION D'EAU	
CANALISATION D'EAU	EGOUT
CANALISATION D'EAU	B. P.

(15)

3223
Exhibit 2.