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FINAL REPORT NO. 82

ITEM NO. 30

**INSPECTION OF HYDROGENATION
AND FISCHER-TROPSCH PLANTS IN
WESTERN GERMANY DURING
SEPTEMBER, 1945**

Warren, J. E.

... to give any
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BRITISH INTELLIGENCE OBJECTIVES

SUB-COMMITTEE

LONDON—H.M. STATIONERY OFFICE

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INSPECTION OF HYDROGENATION AND FISCHER-
TROPSCH PLANTS IN WESTERN GERMANY DURING
SEPTEMBER, 1945.

Reported by

T.E. WARREN - Canadian Investigator

CIOS Black List Item 30

Fuels and Lubricants

~~BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE~~
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3608

28 p.

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Introduction

During September 1945 visits were made to the four hydrogenation plants and the six Fischer Tropsch plants in the British zone of occupation. Two research organizations specializing in the field of synthetic liquid fuels and two secondary plants utilizing Fischer Tropsch products as raw materials were also visited.

The purpose of the visits was to obtain general information for Canadian Government agencies on the German synthetic liquid fuel industry. The targets however, had been investigated in the period March-May 1945 by CIOs teams and detailed reports on them have been submitted or are in preparation. For this reason the present report deals chiefly with developments in the interval May - September 1945 and with plans for reconstruction and future operations.

Location.

All but one of the plants are situated in the Ruhr district and are dependant for raw materials on bituminous coal. Beginning with the most easterly at Kamen they extend along the Ruhr valley, with a zone of concentration near Gelsenkirchen, to the most westerly which is across the Rhine, at Moers. The only plant not in the Ruhr district is at Wesseling, South of Cologne in the Rhine brown coal area.

Most of the plants are situated at the mine from which the coal is produced and in most cases the synthetic oil plant is connected with a power station and a coke oven plant at the mine head. The Ruhr synthetic oil plants are all in a relatively small area together with other industries such as synthetic ammonia and rubber and there is a complicated exchange of material and power among them.

Control

The Military Government Detachment in the area of each plant directs its management and authorizes release of materials and labour for reconstruction. The North German Coal Control has jurisdiction over the supply of coal and, where the plant is located on mine

property, issues the permit to inspect it. Headquarters of the North German Coal Control are at Villa Hugel, near Essen and there are local offices in the Ruhr Coal Districts.

In the descriptions of the individual plants note has been made of the agency issuing the permit for the visit. In some instances the Military Government or Coal Control Offices have files of information concerning the plants and, in future, investigators may find it advisable to consult these before making inspections. It may also be possible for Officers of the Military Government or the Coal Control to deal with specific questions by correspondence.

The Hydrogenation Plants.

Raw Materials

The raw materials directly hydrogenated are high volatile bituminous coal with small quantities of tar and tar oils (Gelsenberg and Scholven), a mixture of coal tar pitch and tar oils (Ruhrol) and dried brown coal (Wesseling). Other materials, used for hydrogen production, are brown coal briquettes (Wesseling), coke (Gelsenberg, Scholven and Ruhrol), coke-oven gas (Ruhrol and Scholven), by-product hydrogen from the synthetic rubber works at Huls (Gelsenberg and Scholven) and various gases produced as by products in the hydrogenation process.

Processes

In the liquid phase stage two types of processes have been used. The original method employing a tin catalyst with acid at 300 atmospheres pressure is used at Scholven. The other plants have used the more recently developed method employing 700 atmospheres pressure with iron catalysts. There are also two types of vapour phase operation one using saturation and splitting stages at 300 atmospheres (Wesseling, Gelsenberg and Scholven) and the other, used only by Ruhrol, which operates at 700 atmospheres in one stage with a chromium-zinc-molybdenum-active earth catalyst. For production of aviation gasoline there were dehydrogenation and iso-octane plants at Scholven and Wesseling but at the latter they were only in the initial stages of operation.

Products

The principal product of the hydrogenation plants is petrol of high octane number suitable for aviation base stock. The Ruhröl plant also produces fuel oil, and all produce propane and butane for motor fuel, iso-octane manufacture, synthetic rubber etc. The total quantity of petrol from all the plants when in full operation was approximately 825,000 tons/year.

Status

None of the hydrogenation plants was in operation or had authorization to reconstruct for the production of petrol. At the time of the inspection Wesseling had permission to convert part of the vapour phase equipment to the synthesis of ammonia. At Ruhröl the Military Government Office had authorized the production of oxygen and the power plant had already been put into operation.

In all of the plants, in addition to the bomb damage, all of the control instruments were missing. These were stated to have been removed to Central Germany together with some of the other light equipment before the end of the war.

Although two of the plants had no definite authorization to reconstruct for any purpose there was a considerable amount of activity in all. The management and technical officers were regularly in their offices and all the hydrogenation plants combined, at the time of the inspection, employed about 4,500 workmen on repair work. If the present labour staff could be doubled it was estimated that three of the plants (Wesseling, Gelsenberg, Ruhröl) could be in full operation in 12 to 18 months and could begin with reduced operation in 3 months or less. Scholven could start almost immediately with one vapour phase stall and eventually work up to 50 per cent of former output, but to achieve full production would need much new equipment.

The Fischer-Tropsch Plants

Raw Materials

The principal raw material employed in the Fischer-Tropsch plants in the Ruhr is high temperature coke. At some of the plants, (Moers, Castrop-Rauxel, Kamen) coke oven gas is also used and at Wanne-Eickel a small amount of low temperature coke, produced in Krupp-Lurgi retorts, is used.

Processes

There are two types of processes employed, namely atmospheric and medium pressure operation. Atmospheric operation uses only one type of catalyst-oven, the tube-and-plate design. It is used at all but one of the plants. Medium pressure operation at 7 atmospheres with double-tube catalyst ovens is used at Hoesch-Benzin, Dortmund. At Ruhr-benzin, Holten both types of processes are employed separately and at Wanne-Eickel both designs of catalyst oven are combined in series. At Wanne-Eickel also some of the medium pressure catalyst ovens are of the "taschenrohr" design.

Up to the time of the inspection only the cobalt catalyst had been used in both atmospheric and medium pressure operations.

Products

There are two types of products made respectively by atmospheric and medium pressure operation. Both types consist of normal paraffins and olefines with relatively small amounts of fatty acids and alcohols. The boiling ranges of the products from the two processes however, are different. Increased pressure tends to produce hydrocarbons of higher molecular weight. Typical analyses of the two types of products are given in the following table.

Per Cent of Total Product

	<u>Atmospheric Pressure</u>	<u>Medium Pressure</u>
Petrol	50	20
Diesel Fuel	17.4	25
Kogasin	9.3	22
Fatty acid gatsch	8.0	12
Hard wax	1.3	10
Fatty acids		0.4
Alcohols		0.6
Propane and butane	14.0	10
	<hr/>	<hr/>
	100.0	100.0
	<hr/>	<hr/>

The total of all products produced at all six of the Fischer-Tropsch plants in the Ruhr when in full operation was approximately 400,000 tons per year.

Status

At the time of inspection none of the Fischer-Tropsch plants was in operation. Because of their ability to produce basic materials for soaps, detergents and edible fats, however, there is a possibility that authorization for resumption of operations, may be given. Two of the plants (Wanne-Eickel and Kamen) have already received orders for reconstruction. Priority will probably be given to the plants able to produce the greatest proportion of waxes and the least of petrol. The controlling factor in this trend is the ability to produce iron catalysts and this depends on reconstruction of the catalyst factory of the Ruhrchemie at Holten.

Damage in the various plants is stated to be 10 to 50 per cent although it appears greater. As in the hydrogenation plants all of the instruments and some of the lighter equipment has been removed. In all of the plants clearing and repair operations were under way. It was stated that most of the plants could be up to full production in periods varying between seven and eleven months provided that adequate labour and small quantities of material could be made available.

Union Rheinische Braunkohlen Kraftstoff A.G.
(Wesseling)

Location

This plant is situated on the west bank of the Rhine at the town of Wesseling which is 8 miles south of Cologne. It is in the zone administered by the Military Government Office at Cologne and comes under the jurisdiction of the North German Coal Control, District No.7, with offices also in Cologne.

Description

Brown coal is hydrogenated to motor fuels, using 700 atmospheres pressure in the liquid phase and 325 atmospheres in the vapour phase. There are 4 liquid phase stalls and 4 vapour phase stalls. When brown coal only is used as raw material the capacity of the plant is 225,000 tons per year of petrol and diesel oil plus 25,000 tons of treibgas. Tar and shale oil are also occasionally converted, with a correspondingly greater production.

The construction and operation of the plant have been described in detail in reports by L.H.Mulit, CIOS File No. XXVII - 60; and J.A.Oriel, I.H.Jones and H.M.Weir, CIOS Target No 30/4.10, on file at the Ministry of Fuel and Power.

Status.

On September 4th and 5th N.B.Hutcheon and the writer visited this plant. The following personnel were at the plant and were interrogated :-

Dr. Mueller von Blumencron, General Manager
Dr. von Heinz Sustmann, Chief Chemist.

Dr. Sustmann speaks English and conducted the inspection.

Permission for the company to resume the manufacture of petrol has not been granted but authorization has been given to start the synthesis of ammonia and preparations

are being made to convert part of the hydrogenation plant for this purpose.

The crane over the stalls was in operation and 300 atmosphere converters were being prepared for ammonia synthesis. Some of these had been dismantled and taken away and one of them had just been brought back. All the control room instruments had also been taken away and had apparently not been returned. Most of the compressors for 325 atmospheres were missing at the time of the inspection; the roof of the compressor house was only a little damaged so that the compressors must have been removed for use elsewhere rather than destroyed by bombing. In the power plant repair work was in progress.

Dr. Sustmann stated that there were 1000 workers in the plant and that, starting with 600 more, it would be possible to produce petrol at the rate of 1,500 tons per month after 3 months repair work; after 4½ months the production could be 400 tons per month; after 9 months 900 tons per month; and after 18 months 18,000 tons per month.

Gelsenberg Benzin A.G., Gelsenkirchen-
Nordstern

Location

This plant is situated North West of Gelsenkirchen on the North bank of the Emscher canal. It was in the area administered by Military Government Detachment No.113 with offices at Gelsenkirchen.

Description

The raw materials at this plant are high volatile bituminous coal and a relatively small amount of tar oils. The product is aviation base stock. There is no dehydrogenation or iso-octane plant. The liquid phase operation is carried out at 700 atmospheres pressure, using the normal I.G.catalysts. The plant is a large one with 6 coal stalls plus one under construction, 4 saturation stalls and 3 splitting stalls. It was capable of producing about 340,000 tons per year of petrol plus about 100,000 tons per year of propane and butane for motor car fuel or other purposes.

A detailed report on this plant has been prepared by C.Cockram, CIOS Target No 30/4.08. This report is on file at the office of the Ministry of Fuel and Power.

Status.

On September 7th and 8th the writer visited the plant and interrogated the following personnel:-

Dr. Paul Jacob, Chief Chemist.
Dr.Erich Friehmelt, Works Chemist.

The manager of the plant, Dr.Pross, was absent.

At the time of the inspection repair work was being carried on to a considerable extent. About 2000 workers were employed as compared with 5000 for normal operation and 7000 for the original construction. It was stated that if coke was available for the manufacture of hydrogen 1 or 2 stalls could be started immediately, and in 18 months the plant could be up to full capacity. About 3000 to 4000 workers would be needed to carry out the necessary repairs.

In a typewritten description of the plant submitted

by Dr. Jacob it was stated that the rotating ovens used for coking of heavy residues would be the first equipment to start. These would operate on petroleum residuums and would produce gasoline and diesel oil. Later the vapour phase system could be started on tar oils and finally the coal stalls would be repaired and started in the normal way with tar and coal.

All plans for resumption of operations are, however, subject to approval by the Military Government and at the time of the inspection no licence to manufacture petrol had been issued.

Hydrierwerk-Scholven A.G.
Scholven-Buer

Location

This plant is situated south of Niederscholven, near Recklinghausen. It is in the area administered by the 113 Military Government Detachment with offices in Gelsenkirchen.

Description

High volatile bituminous coal and a relatively small amount of tar were hydrogenated to petrol. The D.H.D. process was used for production of aviation base stock and plants for dehydrogenation of butanes, polymerization and alkylation were used for production of aviation blending stocks. There were 6 coal stalls two saturation stalls and two splitting stalls all operating at 300 atmospheres pressure and employing the established I.G. procedure and catalysts. The maximum output of the plant was about 200,000 tons per year of aviation petrol together with by-products such as hydrocarbons for rubber manufacture, treibgas and pitch making up a total of 273,000 tons per year.

A detailed report on this plant has been prepared by: C.Cockram, CIOS Target No 30/4.09. This report is on file at this office of the Ministry of Fuel and Power.

Status

On September 12th the writer visited the plant and interrogated the following personnel:-

Herr Brunning, Business Director
Dipl. Ing. Starker, Chief Engineer
Dr. Urban, Chief Chemist
Dr. Schmidt, Chemist.

This plant had been very badly damaged by a day-light raid on March 10th, 1945, and at present there are about 1,000 workers employed in making repairs. It was stated to be possible to start one of the stalls on oils on one week's notice. Next a coal stall could be started in 3 months. Eventually the plant could

produce 50 per cent of its former output but without the D.H.D. or iso-octane plants. This would require the operation of 2 coal stalls and 2 vapour phase stalls which would need 1,000 men for operation and another 1,000 for maintenance after the plant was in operation. To restore the plant to 100 per cent capacity would require new instruments, machinery, etc.

A report on the proposed schedule for resuming operations had been submitted to the Military Government.

Ruhröl A.G., Bottrop-Welheim

Location

The full name of this plant is :-

Ruhröl G.m.b.H.
Hugo Stinnes Werke,
Bottrop in Westfalen.

It is situated near Welheim and its position can be fixed as South of the Bottrop-Horst road and North West of Bottrop-Gelsenkirchen railway. The map reference is Sheet 52, Dusseldorf, KO 608,102. It is in the zone administered by Military Government Detachment No.114 with offices at Bottrop. The plant adjoins Vereinigte Welheim mine and its power plant is located at the mine head.

Description

Coal tar pitch and tar oils are hydrogenated to aviation petrol and fuel oil. The process employs 700 atmospheres pressure in both liquid and vapour phases. The vapour phase conversion takes place in one stage with no saturation stage. The liquid phase catalyst is iron deposited on active carbon, "iron grude" which is prepared at Leuna. The vapour phase catalyst is made at Welheim and consists of chromium, zinc and molybdenum deposited on active earth. There are two liquid phase stalls and two vapour phase stalls and the capacity of the plant is approximately 120,000 tons per year of fuel oil and 60,000 tons per year of aviation petrol.

A detailed description of the plant has been prepared by C.Cockram, CIOS Target 30/4.11. This report is on file at the Ministry of Fuel and Power.

Status.

On September 13th the plant was visited by the writer, and Dr. Frese, who is the managing director, and members of his staff, were interrogated.

The plant as a whole appears badly damaged by bombing but was stated to be damaged only to the extent

of 25 - 30 per cent. The associated chemical plant was damaged to about 85 per cent. The power plant was not so badly damaged and has already been put into operation again. The oxygen plant is also ready for operation as soon as ammonia for refrigeration can be obtained. It was estimated by Dr. Frese that the hydrogenation plant could be started at 30 per cent capacity after 3 to 4 months repair work and that it could be at full capacity in 12 months. The cost of repairs would be about 20 - 25 million marks as compared with the original plant cost of 80 - 90 million marks.

There are at present about 450 workers in the plant of whom 250 are employed in the power station and 200 on minor repair work. To undertake major repairs the labour strength would have to be at least doubled.

A Military Government interim report has recommended that reconstruction of the hydrogenation plant be suspended until the labour position is easier and the supply of raw materials is assured. The plant for oxygen production is to be started as soon as possible.

Ruhrbenzin A.G., Holten

Location

This plant is situated just East of Holten and is integral with other parts of the Ruhrchemie group. Authorization to inspect it was issued by the Chief Production Officer, Number 1 (Ruhr) District North German Coal Control.

Description

This is a Fischer Tropsch plant with separate atmospheric and medium pressure sections. In the atmospheric section there are 52 tube and plate ovens and in the medium pressure section there are 73 ovens of the concentric double tube type. The total combined production is about 90,000 tons of hydrocarbons per year. The importance of the plant, however, is not in proportion to the output; the central plant for catalyst manufacture for all the Fischer-Tropsch plants in the Ruhr is in the Ruhrchemie group and here also are located large scale and development plants for synthetic lubricating oil and the OXO process which utilize Fischer-Tropsch products as raw materials.

The construction and operation of the plant has been described in detail by C.C.Hall and V.Haensel, CIOS Target No 30/5.01. This report is on file at the office of the Ministry of Fuel and Power and at the CIOS Library, File Number XXVII - 69.

Status

On September 21st the writer visited this plant and interrogated :-

Dr. Martin, President of Ruhrchemie

~~and several technical members of his staff.~~

The whole Ruhrchemie plant area has been badly damaged by bombing. In the catalyst oven building 7 of the 52 atmospheric pressure ovens were completely destroyed and only 24 were undamaged; 6 of the medium pressure ovens were destroyed and 48 out of 73 were undamaged. About 6 months of reconstruction would be

required to put this part of the plant into full operation. The catalyst factory - on the operation of which the Fischer-Tropsch industry in the Ruhr depends - was damaged to about 25 to 30 per cent. At the time of the inspection no major repair work appeared to be in progress in it. It was stated that the iron-copper-lime-Kieselguhr catalyst would be manufactured in this plant with only minor alterations.

Chemische Werke, Essener Steinkohle A.G.,
Kamen.

Location

- This plant is situated 2½ miles North West of Kamen. It is in the area administered by 1020 Military Government Detachment with offices at Unna. Authorization to inspect the plant was issued by No.3 Ruhr Coal District at Recklinghausen.

Description

The plant employs the Fisher-Tropsch atmospheric pressure process and has few unusual features. The raw materials are coke and coke-oven gas from a large coke-oven installation on the same site. There are 124 ordinary tube-and-plate ovens arranged in two stages. About 85,000 tons per year of total products are produced.

The construction and normal operation of the plant have been reported by C.C.Hall, CIOS Target No. 30/5.06. This report is on file at the office of the Ministry of Fuel and Power and at the CIOS Library, File No. XXVII - 54.

Status

On September 18th the writer visited this plant and interrogated :-

Herr Gabriel, Works Manager.

This plant appeared to be heavily damaged but it was stated to be damaged to the extent of only 20 per cent. Permission has been granted to reconstruct and a large staff of workmen were on the property at the time of the inspection. It was stated that 50 per cent of normal production could be attained in 5 months and 100 per cent in 7 months. The plant employs a total staff of about 600 for normal production.

Triebstoffewerk Rheinpreussen, Moers

Location

This plant is situated at the North East side of Moers. Authorization to inspect it was issued by the Production Officer, Rheinpreussen Group of No.1 Ruhr Coal District. The head office of No.1 R.C.D. is at Hamborn and the office of the Rheinpreussen Group is at Moers.

Description

This is a Fischer-Tropsch plant operating at atmospheric pressure. The raw materials are coke and coke-oven gas, in amounts of 655 tons and 250,000 cubic metres per day respectively. It has a total of 100 catalyst ovens of tube-and-plate design operating in two stages with 55 in the first and 35 in the second and with 10 ordinarily off stream. The products amounted to a total of about 70,000 tons per year. There was also an alcohol plant which produced about 3,000 tons per year of total alcohols largely propyl and butyl.

A very detailed description of the history construction and operation of this plant has been reported by H.V.Atwell and W.C.Schroeder, CIOS Target No. 30/5.05.

This report is on file at the office of the Ministry of Fuel and Power and at the CIOS Library, File No. XXV - 60.

Status

On September 19th the writer visited this plant and interrogated :-

Dr. Struever, Works Manager.

The plant has been damaged by bombing to the extent of 30 per cent. It was estimated to be possible to bring it back to 50 per cent of its normal production in 4 months and to 100 per cent in 7 months. There were, at the time of the inspection, about 200 Fischer-Tropsch workmen in the plant but

some were employed in the coking plant. Normal operation required about 750. To carry out the reconstruction schedule given above about 900 building workmen and about 800 skilled metal workers would be needed. Resumption of operations was also stated to depend on production of catalyst at Holten although some development work is being conducted by Rheinpreussen on an iron catalyst suitable for use at atmospheric pressure.

Hoesch-Benzin, Dortmund

Location

This plant is situated in Wambelerhulz, $2\frac{1}{2}$ miles North East of the centre of Dortmund. It is in the area administered by 918 Military Government Detachment with offices in Dortmund.

Description

This is a Fisher-Tropsch plant using high temperature coke as raw material and producing 52,800 tons per year of total products. It is operated entirely at medium pressure, i.e. 7 atmospheres although it was designed for 10 atmospheres. There are 65 ovens of the usual concentric double-tube design and these are combined in three stages.

The construction and operation of the plant has been reported by R. Neumann and W. C. Schroeder, CIOS Target No. 30/5.04. This report is on file at the office of the Ministry of Fuel and Power.

Status

On September 15th, the writer visited the plant and interrogated :-

Dr. Werres, Works Superintendent and Acting Manager.

The former manager, Dr. Weitenhiller, had recently resigned.

The plant was damaged to the extent of 50 per cent and the Hoesch A.G. has not received an order for structural repairs although some clearing work is in progress. It will be possible to resume operations on the following conditions :-

1. That the catalyst factory of the Ruhrchemie is able to supply catalyst.
2. That a gas holder now on order from Klönne of Dortmund can be supplied.

3. That the Kaiserstuhl coke oven plant is re-opened and able to supply coke.
4. That 300 skilled workmen and 500 others are available for plant reconstruction.

Subject to these conditions the plant can produce 50 per cent of its former capacity, i.e. at the rate of 26,400 tons per year in 5 to 6 months and 100 per cent three months later.

It was stated that the technical and working staff are adequate for normal production operations.

Krupp Treibstoffe Werke G.m.b.H.,
Wanne-Eickel

Location

This plant is situated north of Bochum. Arrangements to visit it were made at the offices of Ruhr Coal Division No.4 of the North German Coal Control near Werden.

Description

This is a Fischer-Tropsch plant with two unique features. The first is that it operates in two stages with 72 atmospheric pressure ovens in the first and 24 medium pressure ovens in the second. The other unique feature is the use of taschenrohren as catalyst tubes in 16 of the 24 medium pressure ovens. The raw materials are high temperature coke, and a relatively small amount of low temperature coke produced at Wanne-Eickel.

The production of total products amounts to 65,000 tons per year.

The construction and operation of the plant have been described by C.C.Hall and A.R.Powell, CIOS Target No.30/5.02. This report is on file at the office of the Ministry of Fuel and Power and at the CIOS Library, File No. XXV - 25.

Status

On September 10th, the writer visited the Krupp offices in Essen and interrogated :-

Dr. Fritz Müller, A Director of Friedrich Krupp A.G.
Dr. Deman, Chemist, Friedrich Krupp A.G.

Later Dr. Deman and the writer went to Wanne-Eickel where the following personnel were interrogated :-

Dipl. Ing. Erich Combles, General Manager.
Dr. H.Fischer, Manager of the Fischer-Tropsch Plant.

Preparations are now under way at Wanne-Eickel to resume

operations of the Fischer-Tropsch plant. Permission has been granted and operations are to begin in December 1945. Because the cobalt catalyst is now "frozen" into the chambers with wax the operations will start with it but it will be replaced as soon as possible with an iron catalyst. Beginning in December, 1 to 2 ovens per day will be changed to an iron catalyst. The purpose of the change is to produce a larger proportion of waxes at the expense of the petrol fraction. Iron catalysts were stated by Dr. Deman to be made by Lurgi at Frankfurt, Rheinpreussen at Moers and Ruhrchemie at Holten. (At a later date the writer visited the latter plants but did not observe any activity in the large scale catalyst factory at Holten and was not shown any large scale catalyst plant at Moers).

There are at present 800 employees in the Wanne-Eickel plant of whom 120 are on the administrative staff. Normal operation requires a total of 900.

Klocknerwerke A.G., Gewerkschaft "Victor",
Castrop-Rauxel.

Location

The plant is $1\frac{1}{2}$ miles North East of Rauxel railway station and adjoins the Gewerkschaft "Victor" Colliery. This plant is under the control of the Military Government office at Castrop-Rauxel. Authorization to inspect the plant was issued by No.3 Ruhr Coal District at Recklinghausen.

Description

On the same site as the Fischer-Tropsch plant is the colliery, a coke-oven installation with by-product recovery, and a synthetic ammonia plant, including equipment for liquefaction of air and coke-oven gas.

The Fischer-Tropsch plant operates at atmospheric pressure with 63 tube-and-plate ovens arranged in two stages. The raw materials are coke and coke oven gas and the total product amounts to about 40,000 tons per year.

The construction and operation of the plant have been reported by C.C.Hall and A.R.Powell, CIOS Target No 30/5.03. This report is on file at the office of the Ministry of Fuel and Power and at the CIOS Library, File No. XXV - 7.

Status

On September 18th the writer visited this plant and interrogated :-

Dr. Braune, Works Manager of the Synthetic Oil Plant.

This plant has not been damaged as badly as many of the others. The catalyst-oven installation especially is very little damaged. It was stated that the plant in general had only been damaged 10 per cent. Regarding a repair schedule it was stated that in 3 months it could produce 50 per cent of normal capacity and in 4 to 5 months 80 per cent.

There is a sufficient staff of workmen for normal operation but for reconstruction 110 skilled workmen and 150 others would be needed.

One obstacle to renewed operation is the fact that the plant operates at atmospheric pressure which produces high yields of petrol with the cobalt catalyst and requires a special iron catalyst for production of the desired high-molecular-weight-products. Dr. Braune stated that a suitable iron catalyst was being developed at Moers. Resumption of any type of operation depends on a supply of catalyst from Holten or elsewhere.

Deutsche Fett-Säure Werke, Witten-Ruhr

Location

This plant is adjoining the Märkische Seifen-Industrie in Witten. Arrangements to inspect it were made through the Military Government Detachment in Witten.

Description

The raw material for the production of fatty acids is the soft wax, "gatsch", fraction from the Fischer-Tropsch synthesis. This has a boiling range of between 320 and 450°C. The wax is oxidized with air and the resulting yield of fatty acids separated from the unoxidized wax by saponification. The fatty acids are then regenerated by acidification and distilled under vacuum. The principal fraction from the vacuum distillation, composed of acids with 9 to 20 carbon atoms per molecule, is esterified with glycerine at the Märkische Seifen Industrie to produce edible fats. The plant has a capacity of 40 to 45,000 tons per year of gatsch, of which about 50 per cent is converted to the principal fraction of fatty acids. The esterification plant produced about 1800 to 2400 tons of edible fats per year.

The construction and operation of the plant has been described by E.L. Baldeschweiler, CIOS Target No. 22/459. This report is on file at the CIOS Library, File No. XXVI - 50.

Status

On September 20th the writer visited the plant and interrogated the following personnel :-

Dr. K.H. Imhausen, Owner and Manager
Dr. Prosch, Chemist.

The fatty acid plant had sustained practically no damage but was not in operation because no raw material was available. The production of the raw material depends on operation of the Fischer-Tropsch plants which in turn depend on the catalyst supply from Holten. The soap factory was in operation on natural fats.

Schmierolwerke Rheinpreussen,
Homberg.

Location

This plant is situated in Homberg. Authorization to inspect it was issued by the Production Officer Rheinpreussen Group of No. 1 Ruhr Coal District. The head office of No.1 R.C.D. is at Hamhorn and the office of the Rheinpreussen Group is at Moers.

Description

The synthetic lubricating oil plant uses as raw materials a fraction of the Fischer-Tropsch product boiling between 200 and 350°C, and naphthalene. The Fischer-Tropsch fraction, "kogasin" is chlorinated and condensed with the naphtholene by the Friedel-Crafts synthesis. The crude product is neutralized, purified and distilled into several grades of lubricating oil. The capacity of the plant is about 3,650 tons of total lubricating oils per year.

The construction and operation of the plant have been described by H.V.Atwell and W.C.Schroeder, CIOS Target No. 30/5.05. This report is on file at the CIOS Library, File No. XXIV - 9.

Status

On September 19th the writer visited the plant and interrogated :-

Dr. Meusel, Works Manager.

The plant is damaged to only a negligible extent and no equipment seems to have been evacuated from it. Control instruments were in place and the plant appeared ready to begin operations. A number of workers were employed in the laboratory and on maintenance work. It is apparent that only a lack of raw material prevents the plant from operating.

Kaiser Wilhelm Institut fur Kohlenforschung.
Mulheim, Ruhr

Location

The Institute is in Mulheim and authorization to visit it was obtained from the Military Government Office in that city.

Description

The work of the Institute laboratories has, for many years, been applied to the Fischer-Tropsch synthesis and closely related subjects under the direction of Dr. Franz Fischer. Since his retirement the work has progressed along the same lines.

The equipment and war-time operations have been described by V. Haensel, CIOS Target No 30/6.01 and D.R.Dewey, CIOS Target No. 30/6.01. These reports are on file at the CIOS library, file Nos. XXV - 1 and XXV - 27 respectively. Dr. Haensel's report is also on file at the office of the Ministry of Fuel and Power.

Status

On September 22nd the writer visited the Institute and interrogated :-

Dr. Helmut Pichler, Assistant Director
Dr. Herbert Koch, Section Head.

The laboratories appeared to be in normal operation with a full staff. Several units of small-scale synthesis apparatus were in use in the semi-technical laboratory. The analytical laboratory was busy, with some of the spinning band fractionating columns in use. According to Dr. Pichler no change in the general field of investigation of the Institute is planned.

Interrogation of I.G. Farbenindustrie Personnel,
Heidelberg

Dr. Mathias Pier and technical associates from the I.G. Farbenindustrie research and development laboratories at Ludwigshaven were interrogated at the residence of Dr. Pier in Heidelberg. Arrangements in Heidelberg were made by Detachment 643, Co.E 2nd Military Government Regiment, Heidelberg, APO.758.

On September 28th the writer interrogated the following personnel :-

- Dr. Mathias Pier, Director of I.G. Farbenindustrie and Director of Test plants in Ludwigshaven.
- Dr. Maria Höring, Scientific Collaborator with Dr. Pier.
- Dr. Ernst Donath, in charge of experimental plant on hydrogenation at Ludwigshaven.
- Dr. Rudolf Mattis, Associate of I.G. Farbenindustrie in sub-control office in Pilsbury.

Status of Hydrogenation Research, Ludwigshaven

Regarding the research and development laboratories devoted to hydrogenation in Ludwigshaven; Dr Pier stated that this equipment had been badly damaged by bombing. Some of the small equipment and the catalyst plant had also been removed to central Germany in preparation for work there. A large number of I.G. personnel were, however, still at Ludwigshaven.