CONFIDENTIAL

GERMAN PETROLEUM INDUSTRY

HAMBURG DISTRICT

REPORT No.12

INTERROGATION OF DR. KURT WISSEL

HYDRIEWERKE. PÖLITZ (STETTIN)

Reported By

MR. PAUL K. KUHNE - U.S. Petrol. Admin. for War

on behalf of the

BRITISH MINISTRY OF FUEL & POWER

AND THE

U.S. TECHNICAL INDUSTRIAL INTELLIGENCE COMMITTEE

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FUELS AND LUBRICANTS

COMBINED INTELLIGENCE OBJECTIVES SUB-COMMITTEE

G-2 Division, S.H.A.E.F. (Rear) APO.413

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I N T R O D U C T I O N

Dr. Wissel who was Chief Chemist and Director of Hydrierwerke, Pölitz (Settin), fled from Pölitz carrying with him six wooden cases of documents relating to the operation of the Hydrierwerke plant during the past four years. He was intercepted while trying to cross the Elbe and detained. His arrest was reported to Col. (Sim.) L.P. Evans, CAFT assessor, who had him brought to WINSEN along with the document cases, where he was interrogated.

Wissel was not very cooperative and showed surprisingly little knowledge of certain operating details, especially catalyst composition. The documents, however, appear to be valuable. These have been carefully sifted and the more important ones selected and shipped to London.

Wissel has been released and sent to his home at Gifhorn (south of Uelzen, 20 km. north of Braunschweig) Bodemannstraase 2. Arrangements were made for him to report to the AMG at regular intervals so as to be available for future interrogation, if necessary. Wissel lived in the United States from 1930-1936, working as a consulting engineer on hydrogeneration for Standard Oil Company of N.J.

Description of Pölitz Operations.

a) General Construction of the Pölitz plant started in 1938 and operation commenced in 1940. Since that time, construction has been continually in progress.

The Pölitz plant covers an area of 2 square kilometers and normally employs a total of 15,000 men: 10,000 for maintenance, new construction and bomb damage repair; 5,000 for operation. One half of the total number of workers employed are foreign; most of these were Poles. Power was generated from "Steinkohle", totalling approximately 80,000 KW; an additional 20,000 was purchased. The principal operation was the manufacture of aviation gasoline by hydrogenating coal and coal tar, and occasionally petroleum gas oil. Some tar was made by retorting coal, using the Ramag Process; the balance was purchased from various tar plants in Germany, including those in the Ruhr and Silesia.

The projected production capacity of the plant was 400,000 T/yr. of finished product, consisting of 80% of Aviation Gasoline Blending Stocks, 8% Diesel fuel oil and 12% liquefied gas; however, when greater proportions of petroleum gas oil were hydrogenated, production increased to 55,000-60,000 T/Mo.

Capital investment was 300,000,000 marks and the plant was owned jointly by I.G.Farbenindustrie, Rhenania-Ossag Mineralölwerke and Deutsche Amerikanische Petroleum Gesellschaft.

Technical information and catalysts were furnished by I.G.

The plant was bombed continually. On May 29, 1944, it was bombed out completely and for six weeks production ceased while repairs were made. The day the plant started up again, another bombing raid knocked it out. This time, repairs required ten weeks to complete and the day after operations commenced, the plant was again bombed. Up till April 1945, when the plant was shut down completely, production fluctuated between 10 and 20% of total capacity. In spite of the severe bombing attacks, only 150 people lost their lives.

b) Plant Personnel Principal plant personnel are as follows:

Dr. Duden	:	Associate Director, in charge of legal and financial matters.
Dr. Paul Oschmann	:	In charge of water gas plant, heating gas and hydrogen compression to 300 atmospheres.
Dr. Rudolf Hüttner	:	In charge of methane-steam cracking plant, gas purification, iso-octane manufacture, dehydrogenation of iso-butane.
Dr. Hans Schmitt	:	In charge of hydrogenation, hydrogen compression from 300 to 700 atms., high pressure units, and recovery of oil from the residue from the hydro ovens. (Dr. Stiffen was in charge of the DHD plant under Schmitt).
Dr. Diepenbruck	:	In charge of distillation units, blending and finishing
Dr. Stümpke	:	In charge of engine testing laboratory.
Dr. Huthwelker	:	In charge of routine control laboratory (no research carried out at Pölitz).

c) Operations Summary Operations at Pölitz were briefly as follows:

Coal or coal tar is hydrogenated in the sump phase using an iron catalyst. The hydro product is rerun yielding (a) Gases though C_4, (b) Light gasoline to 100°C., (d) Middle oil from 220°C. to 360°C., (e) Slag.

(i) The gas fraction is superfractionated to give methane (a mixture of 40% methane, 30% ethane and 30% propane, approximately), isobutane and normal butane. The methane mixture is used in the manufacture of hydrogen using the standard I.G. Methane-Steam Process. The iso-butane is dehydrogenated to iso-butylene, polymerized to di-isobutylene and hydrogenated to iso-octane. The normal butane is liquefied and sold in cylinders for power fuel.

(ii) The light gasoline, testing 87 octane number ASTM Motor Method with 0.12% by vol. TEL (equivalent to 4.5 c.cs./U.S.Gal.) is shipped to WIFO blending plants.

(iii) The hydro-naphtha is delivered to the DHD plant, a process that converts the naphthenes present in the hydro-naphtha to aromatics, using a chromium catalyst. The DHD product, containing 55-60% of aromatics, and testing 88 octane number ASTM Motor Method with 0.12% TEL, is also shipped to WIFO blending plants.

(iv) The Middle Oil is hydrogenated in the gas phase, using tungsten sulfide catalyst, 5058 or 6434. Gas oil from Rumania or Hanover is also used for charging to the gas phase ovens.

(v) The slag is pulped with middle oil for recovery of any tar. The oil mixture is then charged to the sump phase hydro operation.

(d) Hydrogen Manufacture Approximately 70% of the required hydrogen is manufactured from the methane fraction by the same process used by I.C.I. and S.O. of N.J., i.e. methane and steam are passed through NCTS tubes containing a nickel catalyst. 100% excess steam is used and the conversion takes place at 650°C. and atmospheric pressure. Pölitz has eleven units with a capacity of 9,000 cubic meters of H_2 per unit/hr. The ovens are fired with producer gas, CO_2 is removed at 25-27 atmospheres by water washing; CO is removed at 300 atmospheres using ammoniacal copper solution (I.G.Process). The hydrogen is then compressed to 700 atmospheres with 15 Borsig six stage compressors, having a capacity of 10,000 cu.meters per hour per compressor. Catalyst life is very long; the catalyst placed in the plant in 1940 has never been changed. Steaming is seldom required. The remainder of the hydrogen needed is secured from water gas. Eight water gas sets (Pintsch) are used.

(e) Hydrogenation Silesian coal, shipped by rail to Politz, testing 33% by wt. volatile matter, 6% ash, and approximately 1.0% sulfur is the principal charge stock for the hydrogenation plant. Four of the seven units (4 ovens per unit) are used on coal paste, 2 for tar and gas oil, and 1 unit, operating at 300 atmospheres, is used for iso-octane manufacture.

Coal is hydrogenated at 700 atms. and 450°C. using an iron sulfate catalyst. 40,000 cu.m. of hydrogen and 30-35 tons of coal paste are charged per hour. The paste is composed of 45% powdered coal and 55% heavy fuel oil.

Middle oil and petroleum gas oil are hydrogenated in the gas phase at 300 atms. and 400°C. using tungsten sulfide catalysts, 5058 or 6434. Normal charging rate was said to be 25 cubic meters of oil per hour, and 35,000 cubic meters of hydrogen.

(f) D.H.D. The hydro-naphtha from rerunning the hydroplant product is charged to the DHD plant. Two units, each containing five reactors, are in use. The first four reactors in each unit operate at 500-530°C. and 30-50 atmospheres pressure, converting the naphthenes in the charge to aromatics: the fifth reactor, at 300°C. to hydrogenate any olefins from the aromatization stage. While Wissel stated that a chromium catalyst was once used, he expressed some doubt as to the present catalyst composition (supplied by I.G. and probably molybdenum oxide on alumina). The same catalyst is used in all five reactors.

Yield of DHD gasoline is 75-78% by wt; the material tests 88 octane with 0.12% by vol. TEL and 180°C. end point, with a minimum of 35% evaporated at 100°C. Average cycle is 80% on stream, 20% regeneration with average time on stream varying between 100-160 hours. Inert gas containing 5% added air (1% O_2) is used for regeneration; this is circulated through the reactors at 500-540°C. and 50 atms. pressure until regeneration is complete. Capacity of the DHD plant is 140,000 T/yr. of finished product.

(g) Iso-octane As previously noted, iso-butane is separated from the normal butane, the normal butane liquefied and sold. The iso-butane fraction, 96% purity, is dehydrogenated in a standard I.G. dehydrogenation plant, using a chromium catalyst. (Wissel could not remember the operating details; however, these are covered by the documents and also by reports from other plants). The iso-butylene is polymerized to di-isobutylene using sulfuric acid catalyst and the resultant product hydrogenated to iso-octane, principally 2,2,4-trimethylpentane, testing 97-98 octane No., ASTM Motor Method, unleaded. Normal production is 1000 T/Mo.

Miscellaneous

The boiler house at Pölitz is of latest design, producing 600 T/Hr. of steam at 80 atms. Water is obtained from the Oder and treated with "Wofatit", a base exchange water treating method.

Phenols are removed from the water effluent from the plant by extraction with "Phenosolvan" in a counter-current operation. Loss of chemical (thought to be tri-cresyl phosphate) is excessive.

No blending of aviation gasoline was conducted at Pölitz. All blending stocks were sold FOB Pölitz to WIFO (Wirtschaft Forschung), a government-controlled distribution agency, maintaining blending plants in various localities. Up until the last four weeks, no TEL was used since all blending operations were carried out elsewhere. Storage capacity of 20,000 tons (170,000 bbl.). Stocks never exceeded more than a few days supply due to the urgent demand for aviation gasoline.

Conclusions

The information obtained from Wissel should be checked carefully with that from other sources and with the Pölitz documents. Wissel's "memory" was bad and he had to be prompted many times.

The documents taken from Wissel appear to contain much valuable data, although it will take considerable time to assess them properly.

Date of Interrogation & Party

13th & 14th May, 1945.

Mr. E.H. Boomer (Can.)
Mr. C.H. Barton (Brit.)
Mr. V. Haensel (U.S.)
Mr. Paul K. Kuhne (U.S.)

(Sgd.) PAUL K. KUHNE.