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ORNL-5211
(Vol. III of ORNL-5209)

Evaluation of the SYNTHOIL PROCESS

VOLUME III
UNIT BLOCK FLOW DIAGRAMS
for a
100,000 BARREL/STREAM DAY FACILITY

MASTER

OAK RIDGE NATIONAL LABORATORY

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U.S. Department of Commerce
5285 Port Royal Road, Springfield, Virginia 22161
Price: Printed Copy \$4.00; Microfiche \$3.00

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ORNL-5211
(Vol. III of ORNL-5209)
Dist. Category UC-90d

Contract No. W-7405-eng-26
CHEMICAL TECHNOLOGY DIVISION

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VOLUME III
UNIT BLOCK FLOW DIAGRAMS FOR A
100,000 BARREL/STREAM DAY FACILITY

Principal Author

R. Salmon

Contributing Authors

M. S. Edwards

W. C. Ulrich

Engineering Support

E. G. St. Clair

D. A. Dyslin

P. M. Lantz

G. R. Peterson

D. E. Reagan

Prepared for the
Energy Research and Development Administration/Fossil Energy
Division of Major Facility Project Management

Date Published - June 1977

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Oak Ridge, Tennessee 37830
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UNION CARBIDE CORPORATION
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GLOSSARY

B/SD	=	barrels per stream day
BTU/D	=	British thermal units per day
DEA	=	diethanolamine
GPM	=	gallons per minute
HHV	=	higher heating value
I.P.	=	intermediate pressure
MM	=	10^6 , million
PSIA	=	pounds per square inch, absolute
PSIG	=	pounds per square inch, gauge
TPD	=	tons per day
ppmv	=	parts per million by volume

ABSTRACT

This volume consists of individual block flowsheets for the various units of the Synthoil facility, showing the overall flows into and out of each unit. Material balances for the following units are incomplete because these are proprietary processes and the information was not provided by the respective vendors:

Unit 24 Claus Sulfur Plant

Unit 25 Oxygen Plant

Unit 27 Sulfur Plant (Redox Type)

Unit 28 Sour Water Stripper and Ammonia Recovery Plant

The process information in this form was specifically requested by ERDA/FE for inclusion in the final report.

Fig. 1. Coal preparation.

Fig. 2. Synthoils reaction and product filtration.

Fig. 3. Recycle gas and fuel gas DEA treating.

Fig. 4. High-temperature CO shift conversion.

Fig. 5. Low-temperature CO shift feed gas treating.

Fig. 6. Gasification.

Fig. 7. Raw gas treating.

Fig. 8. Low-temperature CO shift conversion.

Fig. 9. Low-temperature shift product gas CO₂ removal.

Fig. 10. Claus sulfur plant.

Fig. 11. Oxygen plant.

Fig. 12. Low-temperature carbonization.

Fig. 13. Sulfur plant (redox type).

Fig. 14. Sour water stripper and ammonia recovery plant.

Fig. 15. Product distillation.

Fig. 16. Steam and condensate system.

Fig. 17. Industrial water system.

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