PACKAGE ID - 000759IBMPC00 CIRCUIT2.4

KWIC TITLE - 2-Stage Classification Modeling

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LIMITATION CODE -UNL **AUDIENCE CODE -** UNL

COMPLETION DATE - 12/01/1989 **PUBLICATION DATE -** 12/01/1987

DESCRIPTION - CIRCUIT2.4 is used to design optimum two-stage classification configurations and operating conditions for energy conservation. It permits simulation of five basic grinding-classification circuits, including one single-stage and four two-stage classification arrangements. Hydrocyclones, spiral classifiers, and sieve band screens can be simulated, and the user may choose the combination of devices for the flowsheet simulation. In addition, the user may select from four classification modeling methods to achieve the goals of a simulation project using the most familiar concepts. Circuit performance is modeled based on classification parameters or equipment operating conditions. A modular approach was taken in designing the program, which allows future addition of other models with relatively minor changes.

PACKAGE CONTENTS - Software Abstract; NESC Note 90-05; DOE/ID-12440-3; Media Includes Source Code, Object Programs, Sample Problem Input;

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - 2 5.25 Diskettes

METHOD OF SOLUTION - CIRCUIT2.4 starts its calculations at the beginning of the circuit and proceeds through grinding and classification unit operations until all process stream variables are calculated. A ball-mill model is used as the grinding model. For single-stage classification, one classification step follows ball-mill grinding and the coarse-particle stream is the circuit product. In two of the four two-stage classification flowsheets, the coarse-particle stream from the first classifier is fed to the second classifier. The fine-particle streams are combined as circuit product for one case; the second stage fine-particle stream is recycled to the first stage in the other flowsheet. In the remaining two flowsheets, the fine-particle stream from the first classifier is sent to the second stage. The second-stage fine-particle stream is the circuit product in both flowsheets. In one case, both coarse-particle streams are returned to the mill. In the other, the second-stage coarse-particle stream is recycled to the first-stage classifier. A selection of semi-empirical and

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METHOD OF SOLUTION -(CONT) empirical classification models is offered. Modeling based on known classification parameters or equipment and operating variables is allowed. Coarse and fine product stream data may be calculated by any of four available methods, the exponential sum, logistic, double exponential, or simple logarithmic, if the appropriate classification parameters are known. If these parameters are not available, they can be predicted by the program based on equipment and operating variables for hydrocyclones, spiral classifiers, and sieve bend screens.

COMPUTER - IBM PC

OPERATING SYSTEMS - MS-DOS 2.5 or later

PROGRAMMING LANGUAGES - Microsoft FORTRAN 3.3

SOFTWARE LIMITATIONS - The grinding mill model is for a ball mill. Models for rod mills and other types of grinding devices are not included at this time.

SOURCE CODE AVAILABLE (Y/N) - Y

HARDWARE REQS - CIRCUIT2.4 requires an IBM PC or compatible microcomputer with 640 Kbytes of random access memory, two flexible disk cartridge drives or one fixed disk drive, and, optionally, a math coprocessor to increase operating speed and an 80 column printer.

TIME REQUIREMENTS - Typical running time is 15 minutes on a machine without a math coprocessor and 10 seconds on a 386 based machine with a math coprocessor.

REFERENCES - L.K. Baltich, Mathematical Modeling of Two-Stage Classification, Technology Transfer Summary and User's Guide, DOE/ID-12440-3, August 1987.

ABSTRACT STATUS - Released AS-IS January 10, 1995.

SUBJECT CLASS CODE - T

KEYWORDS -
COMPUTER PROGRAM DOCUMENTATION
C CODES
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GRINDING
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SPONSOR - DOE/CE

PACKAGE TYPE - AS - IS