PACKAGE ID - 000526IB38600 LEADER

KWIC TITLE - Low-Temperature Engineering Algorithm of Deposition Risk

AUTHORS - Erickson, T.A.
University of North Dakota, Grand Forks (United States)

Hurley, J.P.
University of North Dakota, Grand Forks (United States)

Benson, S.A.
University of North Dakota, Grand Forks (United States)

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

COMPLETION DATE - 12/10/1992 **PUBLICATION DATE -** 12/10/1992

DESCRIPTION - LEADER is designed to qualitatively predict the potential coal ash deposition in an utility boiler in convective pass heat exchange surfaces below 1850 F. This program concentrates on those deposits which develop their strength through sulfation and not silicate sintering. Massive deposits that form on the upstream sides of boiler tubes at higher temperatures are not considered in this model.

PACKAGE CONTENTS - Directory of Media Provided; Software Abstract; LEADER Notes; LEADER Operations Manual;

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - 3 3.5 Diskettes

METHOD OF SOLUTION - LEADER contains two separate types of solutions. The program initially predicts the particle-size and composition distribution of the resultant coal ash as it is combusted in a utility boiler. This section uses a series of mathematical distributions to simulate the mineral coalescence, mineral fragmentation, heterogenous condensation, and homogenous condensation. The second portion of the program uses experimentally/theoretically derived mathematical equations to predict the deposition rate, strength development rate, and thermal properties of the deposits.

COMPUTER - IBM PC 386

OPERATING SYSTEMS - DOS

PROGRAMMING LANGUAGES - FORTRAN with DOS extender

PACKAGE ID - 000526IB38600 LEADER

SOFTWARE LIMITATIONS - LEADER CONTAINS NO SOURCE CODE

SOURCE CODE AVAILABLE (Y/N) - Y

UNIQUE FEATURES - The LEADER code was developed from qualitative concepts and quantitative full-scale data from five different utilities and six different coals. Both the coal ash formation and deposition fundamentals are enhanced with on-line and off-line data from the utilities. LEADER will also allow the user to run the code on a single coal or blend of two coals. The particle-size and composition predictions will discern between those mechanisms of coal-to-coal interaction and noninteraction during the formation of coal ash. The LEADER program is designed to produce accurate data for both pulverized coal-fired and cyclone systems. The type of system is input during startup and is taken into account during operation. LEADER contains a user-friendly graphical interface and computer screen viewing of results along with hard copy generation from files created during operation.

RELATED SOFTWARE - No auxiliary software is required to run the LEADER program.

OTHER PROG/OPER SYS INFO - The LEADER program requires a ndprun.exe file (copyright 1987, 1990 Microway Inc.). This file is included with the software and is freely distributed with this program with appropriate copyright documentation which is included in the program documentation.

HARDWARE REQS - LEADER requires 4 Meg of extended memory on a 386 or higher processor with a math coprocessor. The program also requires a VGA graphics card and monitor.

TIME REQUIREMENTS - Single coal 386/20 MHz 25 minutes, 486/33 MHz 15 minutes, and 486/50 MHz 12 minutes. Blend of two coals 386/20 MHz 40 minutes, 486/33 MHz 30 minutes, and 486/50 MHz 20 minutes.

REFERENCES - LEADER Operations Manual, 1992; LEADER Notes.

ABSTRACT STATUS - Submitted November 1992.

SUBJECT CLASS CODE - T

KEYWORDS -
COMPUTER PROGRAM DOCUMENTATION
COMBUSTION PRODUCTS
BOILERS
FLY ASH
COAL
RISK ASSESSMENT
DEPOSITION

EDB SUBJECT CATEGORIES -
990200 014000

PACKAGE ID - 000526IB38600 LEADER

SPONSOR - DOE/FE

PACKAGE TYPE - AS - IS