

**PACKAGE ID** - 000218IBMPC01 BPM3.0

**KWIC TITLE** - Fossil-Fired Boilers

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

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**DESCRIPTION** - The BOILER PERFORMANCE MODEL (BPM3.0) is a set of programs for predicting the heat transfer performance of fossil-fired utility boilers. The programs can model a wide variety of boiler designs, provide boiler performance estimates for coal, oil or gaseous fuels, determine the influence of slagging and fouling characteristics on boiler performance, and calculate performance factors for tradeoff analyses comparing boilers and fuels. Given a set of target operating conditions, the programs can estimate control settings, gas and steam operating profiles through the boiler, overall boiler efficiency, and fuel consumption. The programs are broken into three categories: data, calculation, and reports with a central processor program acting as the link allowing the user to access any of the data or calculation programs and easily move between programs. The calculations are divided among the following five programs: heat duty calculation, combustion calculation, furnace performance calculation, convection pass performance calculation, and air heater performance calculation. The programs can model subcritical or supercritical boilers, most configurations of convective passes including boilers that achieve final reheat steam temperature control by split back pass, boilers with as many as two reheat circuits and/or multiple attemperator stations in series, and boilers with or without economizers and/or air heaters. Either regenerative or tubular air heaters are supported. For wall-fired or tangentially-fired furnaces, the furnace performance program predicts the temperature of the flue gases leaving the furnace. It accounts for variations in excess air, gas recirculation, burner tilt, wall temperature, and wall cleanliness. For boilers having radiant panels or platens above the furnace, the convective pass program uses the results of the combustion chamber calculation to estimate the gas temperature entering the convective pass.

**PACKAGE CONTENTS** - Media Directory; Software Abstract; User's Manual March 1992; Sample Boiler Models Report March 1992; Media Includes Executable, Sample Problems, Control Information, Library Data;

**SOURCE CODE INCLUDED?** - No

**MEDIA QUANTITY** - 5 3.5 Diskettes

**METHOD OF SOLUTION** - BPM3.0 is designed for general use rather than tailored to a particular make or type of boiler. The modeling

**PACKAGE ID** - 000218IBMPC01 BPM3.0

**METHOD OF SOLUTION - (CONT)** components and the calculation programs can be used in any combination. Each model component describes the operation of a specific part of the boiler and can be interconnected with almost any other component to produce many different boiler configurations. Interconnections are made by describing the calculation order and the flow progression of all steam, water, and gas circuits. In addition, each program performs a specific function, permitting easy addition of new programs. Input is specified through four data files that describe the configuration of the boiler and furnace, operating parameters, and fuel.

**COMPUTER** - IBM PC

**OPERATING SYSTEMS** - DOS 3.1

**PROGRAMMING LANGUAGES** - Microsoft QuickBASIC

**SOFTWARE LIMITATIONS** - Maxima of 7 radiation receiving banks/section, 7 controllers/ model, and 2 reheaters/model. Stoker-fired or fluidized-bed furnaces are not supported. These programs can only be used with steam pressures from 80 to 6500 psia and steam temperatures from 200 to 1500 degrees F since the steam table data are limited to these ranges.

**SOURCE CODE AVAILABLE (Y/N)** - N

**OTHER PROG/OPER SYS INFO** - The BPM3.0 source is not available.

**HARDWARE REQS** - BPM3.0 requires an IBM PC,XT,AT or compatible computer with at least 384 Kbytes of RAM memory, a hard disk with 2.5 megabytes of free space, Epson FX-85 or HP LserJet or compatible printer, CGA, EGA, or VGA adapter cards to display graphics.

**REFERENCES** - P. Kemeny, J. Lagomarsino, D. Clarke, C. Roccanova, G. Woods, D. Miller, and A. Landry, User's Manual for Boiler Performance Computer Programs (BPM 3.0), Burns and Roe Services Corporation Report, March 1992; Sample Boiler Models for Boiler Performance Computer Programs (BPM 3.0), Burns and Roes Services Corporation Report, March 1992.

**ABSTRACT STATUS** - Abstract first distributed March 1988. IBM PC version submitted February 1988, replaced August 1988 by revised Edition B. Version 3.0 submitted May 8, 1992. Released September 14, 1992.

**SUBJECT CLASS CODE** - T

**KEYWORDS** -

COMPUTER PROGRAM DOCUMENTATION  
B CODES  
PERFORMANCE

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BOILERS  
FOSSIL FUELS  
DESIGN  
HEAT TRANSFER  
STEAM GENERATORS  
ELECTRIC UTILITIES  
EFFICIENCY  
FUEL CONSUMPTION  
FURNACES

**EDB SUBJECT CATEGORIES -**

990200 421000 014000 025000 034000 044000

**SPONSOR** - DOE/PET

**PACKAGE TYPE** - SCREENED