PACKAGE ID - 000648IBMPC00 HTRATE

KWIC TITLE - Heat-Rate Improvement Obtained by Retubing Power-Plant Condenser Enhanced Tubes

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

COMPLETION DATE - 12/01/1993 **PUBLICATION DATE -** 06/01/1990

DESCRIPTION - A utility will only retube a condenser with enhanced tubes if the incremental cost of the enhanced tubes can be offset with reduced fuel costs. The reduced fuel cost is obtained for some units because of the higher heat-transfer coefficient of enhanced tubes. They lead to improved condenser performance measured by a lower condenser pressure and therefore a more efficient power plant. However, the higher haet-transfer coefficients do not always guarantee that enhanced tubes will be more cost effective. Other issues must be considered such as the cooling-water flow reduction due to the increased pressure drop, the low-pressure turbine heat-rate variation with backpressure, and the cooling-water pump and system characteristics. These and other parameters must be considered to calculate the efficiency improvement of the power plant as commonly measured by the quantity known as the heat rate. Knowing the heat-rate improvement, the fuel cost, and the incremental increase of the enhanced tubes from the supplier, the payback time can be determined. This program calculates the heat-rate improvement that can be obtained by retubing a power plant condenser with enhanced tubes of a particular type called Korodense LPD made by Wolverine Tube, Inc. The fuel savings are easily established knowing the heat-rate improvement. All electrical utilities are potential users because a condenser is used as the heat sink for every power plant.

PACKAGE CONTENTS - Media Directory; Software Abstract; Heat-Rate Improvements Obtained with the Use of Enhanced Tubes in Surface Condensers; Media Includes Source Code, Executable Module;

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - 1 3.5 Diskette

COMPUTER - IBM PC

OPERATING SYSTEMS - MS-DOS

PROGRAMMING LANGUAGES - MS-FORTRAN 77

SOFTWARE LIMITATIONS - The program is restricted to just one enhanced tube type called Korodense LPD made by Wolverine Tube, Inc., and all program options have not been thoroughly tested.

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SOFTWARE LIMITATIONS -(CONT)
SOURCE CODE AVAILABLE (Y/N) - Y

UNIQUE FEATURES - Interactive or file input; single or two-pass condenser designs; evaluation on a monthly basis; based on the Heat Exchange Institute calculation methods; can input known fouling characteristics.

RELATED SOFTWARE - SUBS.FOR file that contains all the subroutines: fluid properties, HEI material and gauge factors, temperature corrections, etc. INPUT.FOR interactive input file. IPBUG.FOR input file subroutine (file VALUES). OUTPUT.FOR output file subroutine (file RESULTS).

OTHER PROG/OPER SYS INFO - A file called RESULT is used to store dumped data for each run. This file can be examined if the program crashes to determine the source of the problem. The WRITE (6,100) in the source code, HTRATE.FOR is used to write to this file. A file called VALUES is used for data input if the interactive mode is not selected. A sample input form is attached with the program documentation.

HARDWARE REQS - PC computer

TIME REQUIREMENTS - About 10 seconds on 386 type machine

REFERENCES - T.J. Rabas, R. Merring, R. Schaefer, R. Lopez-Gomez, and P. Thors, 'Heat-Rate Improvements Obtained with the Use of Enhanced Tubes in Surface Condensers', 1990 Electric Power Research Institute Conference in Boston Massachusaetts.

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SUBJECT CLASS CODE - H

KEYWORDS -
COMPUTER PROGRAM DOCUMENTATION
H CODES
CONDENSERS
TUBES
HEAT TRANSFER
POWER PLANTS
HEAT RATE

EDB SUBJECT CATEGORIES -
990200 420400

SPONSOR - DOE/CE

PACKAGE TYPE - SCREENED