PACKAGE ID - 000258I037000 THERMIT2

KWIC TITLE - BWR & PWR Thermal-Hydraulic Analysis

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

COMPLETION DATE - 10/01/1983 **PUBLICATION DATE -** 02/27/1992

DESCRIPTION - THERMIT2, the most recent release of THERMIT, is intended for thermal-hydraulic analysis of both boiling and pressurized water reactor cores. It solves the three-dimensional, two-fluid equations describing the two-phase flow and heat transfer dynamics in rectangular coordinates. The two-fluid model uses separate partial differential equations expressing conservation of mass, momentum, and energy for each fluid. By expressing the exchange of mass, momentum, and energy between the fluids with physically-based mathematical models, the relative motion and thermal non-equilibrium between the fluids can exist. THERMIT2 offers the choice of either pressure or velocity boundary conditions at the top and bottom of the core. THERMIT2 includes a two-phase turbulent mixing model which provides subchannel analysis capability. THERMIT2 also solves the radial heat conduction equations for fuel pin temperatures, and calculates the heat flux from fuel pin to coolant with appropriate heat transfer models described by a boiling curve.

PACKAGE CONTENTS - Media Directory; Software Abstract; MIT-EL-81-029; Media Includes Source, Sample Problems;

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - 1 CD Rom

COMPUTER - IBM370

OPERATING SYSTEMS - VMS

PROGRAMMING LANGUAGES - FORTRAN IV

SOURCE CODE AVAILABLE (Y/N) - Y

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OTHER PROG/OPER SYS INFO - THERMIT2 contains proprietary subroutines LEQT1B, UERTST, and UGETIO from the IMSL library. These routines may not be removed from this software for use in other software. THERMIT2 calls subroutine TIMING, which returns the elapsed CPU time; this routine is not included.

HARDWARE REQS - 260K bytes

TIME REQUIREMENTS - NEADB executed the sample problem in 53 CPU seconds on an IBM3081.

REFERENCES - J. E. Kelly, S. P. Kao, and M. S. Kazimi, User's Guide for THERMIT-2: A Version of THERMIT for Both Core-Wide and Subchannel Analysis of Light Water Reactors, MIT-EL-81-029, August 1981.

ABSTRACT STATUS - Abstract first distributed August 1983. IBM370 version submitted October 1981, replaced by revised edition April 1983, replaced by revised edition October 1983, sample problems executed by NEADB June 1984 on an IBM3081.

SUBJECT CLASS CODE - H

KEYWORDS -
COMPUTER PROGRAM DOCUMENTATION
T CODES
TWO-PHASE FLOW
HYDRAULICS
HEAT TRANSFER
TURBULENT FLOW
BWR TYPE REACTORS
PWR TYPE REACTORS
FLUID FLOW
STEADY-STATE CONDITIONS
TRANSIENTS

EDB SUBJECT CATEGORIES -
990200 420400

SPONSOR - DOE/NE

PACKAGE TYPE - SCREENED