PACKAGE ID - 001243IBMPC00 CASE

KWIC TITLE - Candidate Assembly Statistical Evaluation

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LIMITATION CODE -COPY **AUDIENCE CODE -** LIM

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DESCRIPTION - The Savannah River Site (SRS) receives aluminum clad spent Material Test Reactor (MTR) fuel from all over the world for storage and eventual reprocessing. There are hundreds of different kinds of MTR fuels and these fuels will continue to be received at SRS for approximately ten more years. SRS's current criticality evaluation methodology requires the modeling of all MTR fuels utilizing Monte Carlo codes, which is extremely time consuming and resource intensive. Now that a significant number of MTR calculations have been conducted it is feasible to consider building statistical models that will provide reasonable estimations of MTR behavior. These statistical models can be incorporated into a standardized model homogenization spreadsheet package to provide analysts with a means of performing routine MTR fuel analyses with a minimal commitment of time and resources. This became the purpose for development of the Candidate Assembly Statistical Evaluation (CASE) program at SRS.

PACKAGE CONTENTS - Media Directory; Software Abstract; Media Includes Executable;

SOURCE CODE INCLUDED? - No

MEDIA QUANTITY - 1 3.5 Diskette

METHOD OF SOLUTION - The CASE program is based upon a standard MTR fuel evaluation methodology in which candidate fuel is compared against a highly reactive bounding fuel, and a pre established ksafe value of 0.95. The bounding fuel must have been shown to be stored safely in the different racks used for spent MTR fuel storage at SRS. Modeled configurations of six and seven assemblies are typically compared with keff-2s values for the bounding fuel in identical configurations. Fuels are modeled as homogenous cuboids reflected on three adjacent sides by regular concrete and by water on the remaining three sides. No credit is taken for burnup. The candidate fuel modeled configurations of six and seven fuel assemblies are also compared with ksafe. the safe number, Nsafe, is typically established as an outcome of these calculations. For fuel types

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METHOD OF SOLUTION -(CONT) that do not satisfy the basic methodology assumptions a more extensive evaluation is required. CASE uses nine term quadratic equations to yield 95% confidence intervals for predicted keff +2s values. The equations are multiple linear regression fits of SCALE/KENO V.a modeled MTR fuel analysis results

COMPUTER - IBM PC

OPERATING SYSTEMS - Windows

PROGRAMMING LANGUAGES - Excel spreadsheet

SOFTWARE LIMITATIONS - Current program is restricted to cuboid MTR fuel assemblies that are within the range of the statistical range of the models MTR fuel assemblies that are outside of the current range are logically rejected.

SOURCE CODE AVAILABLE (Y/N) - N

UNIQUE FEATURES - The traditional means by which MTR fuel evaluations are performed is through time extensive computer modeling. This is a multistep process requiring the expertise of qualified criticality engineers who are experienced in preparing Monte Carlo computer codes. the input for these Monte Carlo codes area essentially in the form of a specialized programming language in which 3 dimensional fissile systems are described to the computer.

RELATED SOFTWARE - CASE is an EXCEL spreadsheet, and therefore requires use of the Microsoft EXCEL program.

HARDWARE REQS - Standar PC PC clone

TIME REQUIREMENTS - Results are provided virtually instantaneous.

ABSTRACT STATUS - Released AS-IS 9/23/1998

SUBJECT CLASS CODE - Z

KEYWORDS -
COMPUTER PROGRAM DOCUMENTATION
C CODES
SPENT FUEL STORAGE

EDB SUBJECT CATEGORIES -
990200

SPONSOR - DOE/DP

PACKAGE TYPE - AS - IS