

PACKAGE ID - 001324C074000 FRANTIC-3

KWIC TITLE -

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

COMPLETION DATE - 03/01/1987 **PUBLICATION DATE** - 10/01/1987

DESCRIPTION - FRANTIC-3 was developed to evaluate system unreliability using time-dependent techniques. The code provides two major options: to evaluate standby system unavailability or, in addition to the unavailability to calculate the total system failure probability by including both the unavailability of the system on demand as well as the probability that it will operate for an arbitrary time period following the demand. The FRANTIC-3 time dependent reliability models provide a large selection of repair and testing policies applicable to standby or continuously operating systems consisting of periodically tested, monitored, and non-repairable (non-testable) components. Time-dependent and test frequency dependent failures, as well as demand stress related failure, test-caused degradation and wear-out, test associated human errors, test deficiencies, test override, unscheduled and scheduled maintenance, component renewal and replacement policies, and test strategies can be prescribed. The conditional system unavailabilities associated with the downtimes of the user specified failed component are also evaluated. Optionally, the code can perform a sensitivity study for system unavailability or total failure probability to the failure characteristics of the standby components.

PACKAGE CONTENTS - Media Directory; Software Abstract; User's Manual; Media Includes Source Code, Sample Problem Input and Output, Control Information;

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - 1 CD Rom

METHOD OF SOLUTION - FRANTIC-3 uses a sets of analytical equations for component unavailabilities and failure intensities with exponential and Weibull failure time distributions for constant test and duration times. The FRANTIC-3 code determines the state (test, repair, or between test) of each component at each time point and selects the appropriate component unavailability model depending on the state. Using the appropriate logical relationships among the unavailabilities of individual components, the system unavailability (or total failure probability) is also calculated at these time points. Then, the system average unavailabilty (or total failure probability) is calculated by integrating the instantaneous unavailabilty (or total failure probability) over the standby time period. A Boolean equation is specified by the user via SYSCOM

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METHOD OF SOLUTION - (CONT) subroutine to define the system unavailability functions. The system failure occurrence rate function needed for the system unreliability evaluation is user defined via the SYSOP subroutine.

COMPUTER - CDC CYBER740

OPERATING SYSTEMS - SCOPE 2.1.5

PROGRAMMING LANGUAGES - FORTRAN IV

SOURCE CODE AVAILABLE (Y/N) - Y

RELATED SOFTWARE - The first version of FRANTIC was useful only in experiencing a relatively constant hazard rate due primarily to random failure. FRANTIC2 incorporated the Weibull distribution allowing it to model burn-in or wear-out phenomena as well as normal operation. FRANTIC-3 capability is enhanced further to evaluate standby system unavailability or, in addition to the unavailability, to calculate the total system failure probability or unreliability.

OTHER PROG/OPER SYS INFO - FRANTIC-3 uses proprietary CalComp software and system-dependent routines to generate graphical output. Subroutines AXIS, CALINIT, FIN, GRID, LGAXS, LGLIN, LINE, PLOT, PLOTDVC, SCALE, SCALG, and SYMBOL are not included.

HARDWARE REQS - 254,000 (octal) words of memory.

TIME REQUIREMENTS - 55 seconds

ABSTRACT STATUS - Released Tested 11/3/1999.

SUBJECT CLASS CODE - GK

KEYWORDS -

COMPUTER PROGRAM DOCUMENTATION
F CODES
RELIABILITY
REACTOR SAFETY
ENGINEERED SAFETY SYSTEMS
SYSTEM FAILURE ANALYSIS
NUCLEAR POWER PLANTS
AVAILABILITY
SYSTEMS ANALYSIS
TIME DEPENDENCE
TESTING

EDB SUBJECT CATEGORIES -
990200 220900

E S T S C
ENERGY SCIENCE & TECHNOLOGY SOFTWARE CENTER
SOFTWARE ABSTRACT

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SPONSOR - NEA

PACKAGE TYPE - TESTED