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RELAP5/MOD1 QUICK REFERENCE MANUAL

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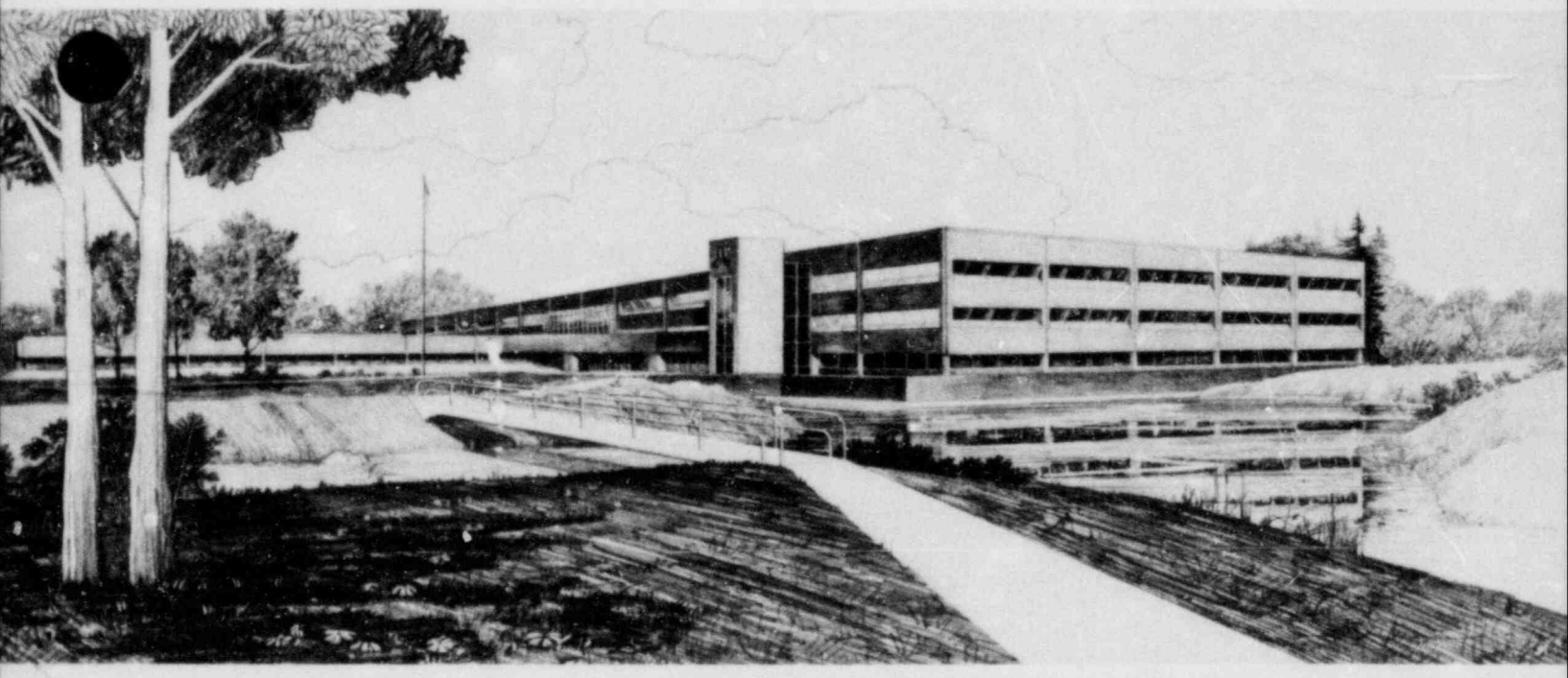
Operated by the U.S. Department of Energy



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INTERIM REPORT

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INTERIM REPORT

ABSTRACT

This document contains an abbreviated form of the input data description for the RELAP5/MOD1 computer code contained in the RELAP5/MOD1 Code Manual, Vol. 2, Appendix A (NUREG/CR-1826, EGG-2070). It is designed as a working reference for RELAP5 users who are familiar with the code input requirements and only need superficial prompting to generate input data without the detailed input descriptions contained in the code manual. The reference parallels the detailed input descriptions, but simply lists input card numbers and associated labels without the textual descriptions.

NRC FIN No. A6330 - Code Development

CONTENTS

PROCEDURE ACCESS AND EXECUTION

ATTACH, RROCS, RELAP5PROCS, ID=RJW.

BEGIN, proc, PROCS, parameters.

where proc is RLP5X or RLP5CLX and the parameters are those listed below.

PROCEDURE PARAMETERS

File Specifications

RELAP5 Source File

SPFN = sfile
SID = sname
SCY = snum
(Defaults if not entered are RELAP5S, RJW, highest cycle.)

RELAP5 Library File (RLP5CLX Only)

LPFN = lfile, LPFN, not entered
LID = lname
LCY = lnum
(Defaults if LPFN only is entered are RELAP5L, RJW, highest cycle; if LPFN not entered, library file is not used.)

RELAP5 Absolute Binary File

XPFN = xfile
XID = xname
XCY = xnum
(Defaults for RLP5X are RELAP5X, RJW, highest cycle; for RLP5CLX, XPFN/XID/XCY is cataloged if parameters are entered.)

Environment Library File (RLP5CLX Only)

EPFN = lfile
EID = lname
ECY = lnum
(Defaults are ENVRS176S, RJW, highest cycle)

(EXECUTION PROCEDURE continued on next page)

Procedure Parameters (continued)

File Specifications (continued)

Water Property File

WPPFN = wpfile
WPID = wpname
WPCY = wpnum
(Defaults are STH2XC, RJW, highest cycle)

Code Update File (RLP5CLX Only)

SUPFN = ufile*
SUID = uname
SUCY = unum

Input Data File

DPFN = file or DPFN*
DID = dname
DCY = dnum
(Defaults if DPFN only is entered are RELAP5D,RJW,highest cycle.)

Update Directives File for Input Data

DUPFN = dufile or DUPFN
DUID = duname
DUCY = dunum
DD
(If DUPFN is not entered, DPFN is not in update format; if DPFN only is entered directives are in INPUT file; if DD is entered, input is 80 columns; if DD is not entered, input is 80 columns + 10 columns for update line numbers.)

Output Options

NOMESSG
(Default is code status printout; if not entered, status is not printed.)

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*If not entered, information is contained in the INPUT file.

(EXECUTION PROCEDURE continued on next page)

Output Options (continued)

NOFTN (RLP5CLX Only)
(If entered, update did not generate any statements to compile and the segload directives are included in the update.)

FLIST = $R = 2$, or FLIST (RLP5CLX Only)
(Default if not entered is L=0; if FLIST only entered, default is R=3.)

LMAP = SBEX or LMAP
(Default if not entered is standard, SB; if LMAP only, no load map is generated.)

SCM = nnnnnn
LCM = mmm
(Default values are SCM = 270,000 and SCM = 200.)

DMP1 = $L1, L2$
DMP2 = $L1, L2$
DMP3 = $L1, L2$

where DMP1-3 are parts of memory to be dumped; L1, L2 are first and last words respectively to be dumped.

MISCELLANEOUS INPUT

Card 100 Problem Type and Option

W1(A)	problem type (NEW, RESTART, PLOT, STRIP)
W2(A)	problem option (trnsnt)

Card 101 Input Check or Run Option

W1(A)	option (INP-CHK, RUN)

Card 102 Units Selection

W1(A)	input units (SI or BRITISH)
W2(A)	output units (SI or BRITISH)

Card 103 Input File Control Card

W1(I)	restart number
W2(A)	ID (not useable)
W3-W6(A)	permanent file name (not useable)

Card 104 Restart-Plot File Control Card

W1(A)	action or ID field (NONE, NO ACTION)
W2-W5(A)	permanent file name (not useable)

Card 105 CPU Time Remaining

W1(R)	first time value (sec)
W2(R)	second time value (sec)

Card 110 Noncondensible Gas Type

W1(A)	gas type (AIR, ARGON, HELIUM, HYDROGEN, NITROGEN, OXYGEN)

(MISCELLANEOUS INPUT continued on next page)

Cards 201-229 Time Step Control Card

W1(R)	time end for this set (sec)
W2(R)	minimum time step (sec)
W3(R)	maximum time step (sec)
W4(I)	control option
W5(I)	minor edit and plot frequency (less than 4096)
W6(I)	major edit frequency (less than 4096)
W7(I)	restart frequency (less than 4096)

Cards 301-399 Minor Edit Requests

W1(A)	variable code
W2(I)	parameter

General	Component Related
TIME (sec)	PMPVEL (rad/sec, rev/min)
TIMEOF (sec)	PMPHEAD (Pa, lbf/in^2)
CPUTIME (sec)	PMPTRQ (N•m, lbf•ft)
NULL 0.	VLVAREA (area ratio)

Volume Related	
RHO (kg/m^3, lbm/ft^3)	QUALA
RHOF (kg/m^3, lbm/ft^3)	QUALE
RHOG (kg/m^3, lbm/ft^3)	QUALS
U (J/kg, Btu/lbm)	Q (watt, Btu/sec)
UF (J/kg, Btu/lbm)	TEMPF (K, °F)
UG (J/kg, Btu/lbm)	TEMPG (K, °F)
VOIDF	TEMP (K, °F)
VOIDG	SOUNDE (m/s, ft/sec)
VELF (m/s, ft/sec)	VAPGEN (kg/sec, lbm/sec)
VELG (m/s, ft/sec)	P (Pa, lbf/in^2)

(MISCELLANEOUS INPUT continued on next page)

MISCELLANEOUS INPUT (continued)

Junction Related

VELFJ (m/s, ft/sec)
VELGJ (m/s, ft/sec)
VELJ (m/s, ft/sec)
VOIDFJ
VOIDGJ

RHOFJ (kg/m^3, lbm/ft^3)
RHOGJ (kg/m^3, lbm/ft^3)
UFJ (J/kg, Btu/lbm)
UGJ (J/kg, Btu/lbm)
MFLOWJ (kg/sec lbm/sec)

Heat Structure Related

HTPOW (W, Btu/sec)
HTRNR (W/m^2, Btu/sec•ft^2)
HTCHF (W/m^2, Btu/sec•ft^2)
HTHTC (W/m^2•K, Btu/sec•ft^2•°F)
HTTEMP (K, °F)

Reactor Kinetics

RKTPOW (W)
RKFIPOW (W)
RKGAPOW (W)
RKREAC (dollars)

Control System

CNTRLVAR (dimensionless)

TRIP INPUT DATA

Card 500 Cancellation Card

W1(A)	DISCARD

Cards 501-599 Variable Trip Cards

W1(A)	variable code (may also be DISCARD or RESET)
W2(I)	parameter
W3(A)	relationship (EQ, NE, GT, GE, LT, LE)
W4(A)	variable code
W5(I)	parameter
W6(R)	additive constant
W7(A)	latch indicator (L, N)

Card 600 Trip Stop Advancement Card

W1(I)	trip number
W2(I)	trip number

Cards 601-699 Logical Trip Cards

W1(I)	trip number
W1(A)	operator (AND, OR, XOR, DISCARD, RESET)
W3(I)	trip number
W4(A)	latch indicator (L, N)

Cards CCCXXNN

CCC = component number
XX = card type
NN = card number within type

Card CCC0000

W1(A)	component name (10 characters or less; use quotes if blanks included)
W2(A)	component type (SNGLVOL, TMDPVOL, SNGLJUN, TMDPJUN, PIPE, ANNULUS, PUMP, BRANCH, VALVE, SEPARATR, ACCUM OR DELETE)
W3(A)	flag command (restart problems only)

SINGLE VOLUME

CCC0101-09	CCC0200	KEY
		NJ or NV
		From
		To
W1(R)		A_V (m^2, ft^2)
		A_J (m^2, ft^2)
W2(R)		L (m, ft)
W3(R)		V (m^3, ft^3)
W4(R)		α_h (deg)
W5(R)		α_V (deg)
W6(R)		ΔZ (m, ft)
W7(R)		ε (m, ft)
W8(R)		D_H (m, ft)
		K_f
		K_r
W9(I)		fe (f = wall friction) (e = equilibrium)
		cahs (c = choking) (a = area change) (h = velocity) (s = inertia)
	W1(I)	Control Word (0-6)
	W2-W6(R)	Fluid Conditions
		Control Word (0 or 1)
		v_ℓ or w_ℓ
		v_v or w_v
		$v_j = 0$

TIME DEPENDENT VOLUME

CCC0101-09	CCC0200	CCC0201-99	KEY
			NJ or NV
			From
			To
W1(R)			A_V (m^2, ft^2)
			A_J (m^2, ft^2)
W2(R)			L (m, ft)
W3(R)			V (m^3, ft^3)
W4(R)			α_h (deg)
W5(R)			α_V (deg)
W6(R)			ΔZ (m, ft)
W7(R)			ϵ (m, ft)
W8(R)			D_H (m, ft)
			R_f
			R_r
W9(I)			fe (f = wall friction) (e = equilibrium)
			cahs (c = choking) (a = area change) (h = velocity) (s = inertia)
		W1(R) search variable	
		W1(I)	Control Word (0-6)
		W2-W6(R)	Fluid Conditions
		W2(I) trip number	
		W3(A) variable request (alph	
		W4(I) variable request (nume	
			Control Word (0 or 1)
			v_ℓ or w_ℓ
			v_V or w_V
			$V_j = 0$

SINGLE JUNCTION

CCC0101-99	CCC0201	KEY
		NJ or NV
W1(I)		From
W2(I)		To
		A_V (m^2, ft^2)
W3(R)		A_J (m^2, ft^2)
		L (m, ft)
		V (m^3, ft^3)
		α_h (deg)
		α_V (deg)
		ΔZ (m, ft)
		ε (m, ft)
		D_H (m, ft)
W4(R)		K_f
W5(R)		K_r
		fe (f = wall friction) (e = equilibrium)
W6(I)		cahs (c = choking) (a = area change) (h = velocity) (s = inertia)
		Control Word (0-6)
		Fluid Conditions
W7(R) C_D		
W8(R)C_D		

W1(I) ... Control Word (0 or 1)

W2(R) ... v_ℓ or w_ℓ

W3(R) ... v_V or w_V

W4(R) ... $v_i = 0$

TIME DEPENDENT JUNCTION

CCC0101	CCC0200	CCC0201-99	KEY
			NJ or NV
		W1(I)	From
		W2(I)	To
			A_V (m^2, ft^2)
		W3(R)	A_J (m^2, ft^2)
			L (m, ft)
			V (m^3, ft^3)
			α_h (deg)
			α_V (deg)
			ΔZ (m, ft)
			ε (m, ft)
			D_H (m, ft)
			R_f
			R_r
			fe (f = wall friction) (e = equilibrium)
			cahs (c = choking) (a = area change) (h = velocity) (s = inertia)
			Control Word (0-6) Fluid Conditions

W2(I) trip number
W3(A) variable request (alpha)
W4(I) variable request (numeric)

W1(I) ..... Control Word (0 or 1)
W1(R) search variable
W2(R) ..... v_ℓ or w_ℓ
W3(R) ..... v_V or w_V
W4(R) ..... $v_j = 0$

		KEY
CCC0001	W1(I)	NJ or NV
		From
		To
CCC0101-99	W1(R)	A_V (m^2, ft^2)
	W2(I) volume number	
CCC0201-99	W1(R)	A_J (m^2, ft^2)
	W2(I) junction number	
CCC0301-99	W1(R)	L (m, ft)
	W2(I) volume number	
CCC0401-99	W1(R)	V (m^3, ft^3)
	W2(I) volume number	
CCC0501-99	W1(R)	α_h (deg)
	W2(I) volume number	
CCC0601-99	W1(R)	α_V (deg)
	W2(I) volume number	
CCC0701-99	W1(R)	ΔZ (m, ft)
	W2(I) volume number	
CCC0801-99	W1(R)	ϵ (m, ft)
	W2(R)	D_H (m, ft)
	W3(I) volume number	
CCC0901-99	W1(R)	R_f
	W2(R)	R_r
	W3(I) junction number	
CCC1001-99	W1(I)	fe (f = wall friction) (e = equilibrium)
	W2(I) volume number	
CCC1101-99	W1(I)	cahs (c = choking (a = area change) (h = velocity) (s = inertia)
	W2(I) junction number	
CCC1201-99	W1(I)	Control Word (0-6)
	W2-W5(R)	Fluid Conditions
	W6(I) volume number	
CCC1300	W1(I)	Control Word (0 or 1)
CCC1301-99	W1(R)	v_ℓ or w_ℓ
	W2(R)	v_V or w_V
	W3(R)	$v_j = 0$
	W4(I) junction number	

(PIPE continued on next page)

CCC2001-2009	W1(R) boron concentration W2(I) volume number

BRANCH OR SEPARATOR

CCC0001	CCC0101-99	CCC0200	CCCN101	CCCN201	KEY
W1(I)					NJ or NV
			W1(I)		From
			W2(I)		To
	W1(R)				A_V (m^2, ft^2)
			W3(R)		A_J (m^2, ft^2)
	W2(R)				L (m, ft)
	W3(R)				V (m^3, ft^3)
	W4(R)				α_h (deg)
	W5(R)				α_V (deg)
	W6(R)				ΔZ (m, ft)
	W7(R)				ϵ (m, ft)
	W8(R)				D_H (m, ft)
			W4(R)		R_f
			W5(R)		R_r
	W9(I)				fe (f = wall friction) (e = equilibrium)
			W6(I)		cahs (c = choking) (a = area change) (h = velocity) (s = inertia)
		W1(I)			Control Word (0-6)
		W2-W6(R)			Fluid Conditions

W2(I)					Control Word (0 or 1)
			W1(R)		v_ℓ or w_ℓ
			W2(R)		v_V or w_V
			W3(R)		$v_i = 0$

ACCUMULATOR

CCC0101	CCC0200	CCC110'	KEY
			NJ or NV
			From
		W1(I)	To
W1(A)			A_V (m^2, ft^2)
		W2(R)	A_J (m^2, ft^2)
W2(R)			L (m, ft)
W3(R)		....	V (m^3, ft^3)
W4(R)	.....		α_h (deg)
W5(R)			α_V (deg)
W6(R)			ΔZ (m, ft)
W7(R)			ε (m, ft)
W8(R)			D_H (m, ft)
		W3(R)	R_f
		W4(R)	R_r
W9(I)			fe (f = wall friction) (e = equilibrium)
		W5(I) = 0	cons (c = choking) (a = area change) (h = velocity) (s = inertia)
			Control Word (0-6) Fluid Conditions

W1(R) pressure (Pa, lbf/in^2)
W2(R) temperature (K, °F)

Control Word (0 or 1)

v_ℓ or w_ℓ

v_V or w_V

$v_i = 0$

(ACCUMULATOR continued on next page)

CCC2200	Accumulator Tank Initial Conditions (continued)
W1(R)	liquid volume in tank (m^3, ft^3)
W2(R)	liquid level in tank (m, ft)
W3(R)	surge line length (m, ft)
W4(R)	surge line elevation (m, ft)
W5(R)	tank wall thickness (m, ft)
W6(I)	heat transfer flag
W7(R)	tank density (kg/m^3, lbm/ft^3)
W8(R)	tank volumetric heat capacity (J/kg•K, Btu/lbm•°F)
W9(R)	thermal conductivity of nitrogen (W/m•K, Btu/sec•ft•°F)

CCC0101-99	CCC0201	KEY
		NJ or NV
W1(I)		F om
W2(I)		To
		A_V (m^2, ft^2)
W3(R)		A_J (m^2, ft^2)
		L (m, ft)
		V (m^3, ft^3)
		α_h (deg)
		α_V (deg)
		ΔZ (m, ft)
		ϵ (m, ft)
		D_H (m, ft)
W4(R)		K_f
W5(R)		R_r
		fe (f = wall friction) (e = equilibrium)
W6(I)		cahs (c = choking) (a = area change) (h = velocity) (s = inertia)
		Control Word (0-6) Fluid Conditions
W7(R)C_D		
W8(R)C_D		

W1(I) ... Control Word (0 or 1)

W2(R) ... v_ℓ or w_ℓ

W3(R) ... v_V or w_V

W4(R) ... $v_i = 0$

(VALVE--GENERAL continued on next page)

CCC0300 Valve Type Card

W1(A)	valve type

CCC0400 CSUBV Table Factors

W1(R)	normalized stem position factor
W2(R)	flow coefficient factor

CCC0401-99 CSUBV Table Entrees

W1(R)	normalized stem position
W2(R)	forward CSUBV ($gpm/psi^{1/2}$)
W3(R)	reverse CSUBV ($gpm/psi^{1/2}$)

CHECK VALVE

CCCC301-99

W1(I)	check valve type
W2(I)	check valve position
W3(R)	closing back pressure (Pa, lbf/in^2)
W4(R)	leak ratio

TRIP VALVE

CCC0301-99

W1(I)	trip number

INERTIAL VALVE

CCC0301-99

W1(I)	latch option
W2(I)	valve initial condition
W3(R)	closing back pressure (Pa, lbf/in^2)
W4(R)	leakage fraction
W5(R)	initial flapper angle (deg)
W6(R)	minimum angle (deg)
W7(R)	maximum angle (deg)
W8(R)	moment of inertia of valve flapper (kg•m^2, lbm•ft^2)
W9(R)	inertial angular velocity (rad/sec)
W10(R)	moment length of flapper (m, ft)
W11(R)	radius of flapper (m, ft)
W12(R)	mass of flapper (kg, lbm)

MOTOR VALVE

CCC0301-99

W1(I)	open trip number
W2(I)	close trip number
W3(R)	valve change rate (sec^{-1})
W4(I)	initial position
W5(I)	valve table number

SERVO VALVE

CCC0301-99

W1(I)	control variable number
W2(I)	valve table number

PUMP

CCC0101-0107	CCC0108	CCC0109	KEY
			NJ or NV
	W1(I)	.....	From
		W1(I)	To
W1(R)	.....		A_V (m^2, ft^2)
	W2(R)	W2(R)	A_J (m^2, ft^2)
W2(R)	.....		L (m, ft)
W3(R)	.....		V (m^3, ft^3)
W4(R)	.....		α_h (deg)
W5(R)	.....	.....	α_V (deg)
W6(R)	.....		ΔZ (m, ft)
			ε (m, ft)
			D_H (m, ft)
	W3(R)	W3(R)	R_f
	W4(R)	W4(R)	R_r
W7(I)	.....		fe {f = wall friction) (e = equilibrium)
	W5(I)	W5(I)	cahs (c = choking) (a = area change) (h = velocity) (s = inertia)
			Control Word (0-6) Fluid Conditions
			Control Word (0 or 1)
			v_ℓ or w_ℓ
			v_v or w_v
			$v_i = 0$

(PUMP continued on next page)

CCC0200	CCC0201	CCC0202	KEY
			NJ or NV
			From
			To
			A_V (m^2, ft^2)
			A_J (m^2 ft^2)
			L (m, ft)
			V (m^3, ft^3)
			α_h (deg)
			α_V (deg)
			ΔZ (m, ft)
			ϵ (m, ft)
			D_H (m, ft)
			R_f
			R_r
			fe (f = wall friction) (e = equilibrium)
			cahs (c = choking) (a = area change) (h = velocity) (s = inertia)

W1(I) ..... Control Word (0-6)
W2-W6(R) ..... Fluid Conditions

W1(I)	W1(I) ..... Control Word (0 or 1)
W2(R)	W2(R) ..... v_ℓ or w_ℓ
W3(R)	W3(R) ..... v_V or w_V
W4(R)	W4(R) ..... $v_i = 0$

(PUMP continued on next page)

CCC0301 Index and Option Card

W1(I)	pump table data indicator (-2, -1, 0, CCC)
W2(I)	two phase index (-1, 0, CCC)
W3(I)	two phase difference table index (-3, -2, -1, 0, CCC)
W4(I)	pump motor torque table index (-1, 0, CCC)
W5(I)	time dependent pump velocity index (-1, 0, CCC)
W6(I)	pump trip number
W7(I)	reverse indicator (0 or 1)

CCC0302-09 Description Card

W1(I)	rated pump velocity (rad/sec, rev/min)
W2(R)	ratio of initial pump velocity to rated pump velocity
W3(R)	rated flow (m^3/s, gal/min)
W4(R)	rated head (m, ft)
W5(R)	rated torque (N•m, lbf•ft)
W6(R)	moment of inertia ($kg•m^2$, $lbm•ft^2$)
W7(R)	rated density (kg/m^3, lbm/ft^3)
W8(R)	rated pump motor torque (N•m, lbf•ft)
W9(R)	TF2 friction torque coefficient (N•m, lbf•ft)
W10(R)	TF0 friction torque coefficient (N•m, lbf•ft)

(PUMP continued on next page)

CCC0302-09 Description Card (continued)

W11(R) TF1 friction torque coefficient (N•m, lbf•ft)

W12(R) TF3 friction torque coefficient (N•m, lbf•ft)

CCC0310 Pump Stop Data

W1(R) elapsed problem time for pump stop (sec)

W2(R) maximum forward velocity for pump stop (rad/sec, rev/min)

W3(R) maximum reverse velocity for pump stop (rad/sec, rev/min)

CCCXX00-99 Single Phase Homologous Curves (XX = 11 to 26)

W1(I) curve type (1 = head, 2 = torque)

W2(I) curve regime

w3(R) independent variable (-1.0 to 0.0 or 0.0 to 1.0)

W4(R) dependent variable

CCCXX00-99 Two Phase Multiplier Tables (XX = 30 or 31)

W1(I) extrapolation indicator (enter 0)

W2(R) void fraction

W3(R) head or torque multiplier depending on table type

(PUMP continued on next page)

CCCXX00-99 Two Phase Difference Tables (XX = 41 to 56)

W1(I)	curve type (1 = head, 2 = torque)
W2(I)	curve regime
W3(R)	independent variable (-1.0 to 0.0 or 0.0 to 1.0)
W4(R)	dependent variable

CCC6001-99 Relative Pump Motor Torque Card

W1(R)	pump velocity (rad/sec, rev/min)
W2(R)	relative pump motor torque

CCC6100 Time-Dependent Pump Velocity Control Card

W1(I)	trip number
W2(A)	alphanumeric part of variable request code
W3(I)	numeric part of variable request code

CCC6101-99 Time-Dependent Pump Velocity

W1(R)	search variable
W2(R)	pump velocity (rad/sec, rev/min)

1CCCG000 General Data

W1(I)	number of heat structures with this geometry, NH
W2(I)	number of mesh points for this geometry, NP
W3(I)	geometry type
W4(I)	steady state initialization flag (0 = no, 1 = yes)
W5(R)	left boundary coordinate (m, ft)

1CCCG100 Mesh Flags

W1(I)	mesh location flag (0 or CCCG)
W2(I)	mesh format flag

1CCCG101-199 Mesh Data

Format 1:

W1(I)	number of intervals
W2(R)	right coordinate (m, ft)

Format 2:

W1(R)	mesh interval (m, ft)
W2(I)	mesh number

1CCCG201-299 Composition Data

W1(I)	composition number
W2(I)	interval number

1CCCG301-399 Distribution Data

W1(R)	source value
W2(I)	interval number

(HEAT STRUCTURE continued on next page)

1CCCG400 Initial Temperature Flag

W1(I)	initial temperature flag (-1, 0, CCCG)

1CCCG401-499 Initial Temperature Data

Format 1:

W1(R)	temperature (K, °F)
W2(I)	mesh point number

Format 2:

W1-WN(R)	temperature (K, °F)

1CCCG501-599 Left Boundary Condition

W1(I)	boundary volume
W2(I)	increment
W3(I)	boundary condition type (0, 1, 1000, 1XXX, 2XXX, 3XXX, 4XXX)
W4(I)	surface area code (0 or 1)
W5(R)	surface area or factor (m^2, ft^2 or m, ft)
W6(I)	heat structure number

1CCCG601-699 Right Boundary Condition

W1(I)	boundary volume
W2(I)	increment
W3(I)	boundary condition type (0, 1, 1000, 1XXX, 2XXX, 3XXX, 4XXX)
W4(I)	surface area code (0 or 1)

(HEAT STRUCTURE continued on next page)

1CCCG601-699 Right Boundary Condition (continued)

W5(R)	surface area or factor (m^2, ft^2 or m, ft)
W6(I)	heat structure number

1CCCG701-799 Source Data

W1(I)	source type (0, 1-999, 1000-1002, 2001-2999)
W2(R)	internal source multiplier
W3(R)	direct heating for left boundary volume
W4(R)	direct heating for right boundary volume
W5(I)	heat structure number

1CCCG801-899 Additional Left Boundary Data

W1(I)	CHF and heat transfer correlation flags (enter 0)
W2(R)	hydraulic diameter (m, ft)
W3(R)	heated equivalent diameter (m, ft)
W4(R)	channel length (m, ft)
W5(I)	heat structure number

1CCCG901-999 Additional Right Boundary Data

W1(I)	CHF and heat transfer correlation flags (enter 0)
W2(R)	hydraulic diameter (m, ft)
W3(R)	heated equivalent diameter (m, ft)
W4(R)	channel length (m, ft)
W5(I)	heat structure number

(HEAT STRUCTURE continued on next page)

201MMM00 Composition Type and Data Format

W1(A)	material type
W2(I)	thermal conductivity format flag (1 or 2)
W3(I)	volumetric heat capacity flag (-1, 1, 2)

201MMM01-49 Thermal Conductivity Data

Table format:

W1(R)	temperature (K, °F)
W2(R)	thermal conductivity (W/m•K, Btu/sec•ft•°F)

Functional format:

W1(R)	lower limit temperature (K, °F)
W2(R)	upper limit temperature (K, °F)
W3(R)	A0 (W/m•K, Btu/sec•ft•°F)
W4(R)	A1 (W/m•K^2, Btu/sec•ft•$°F^2$)
W5(R)	A2 (W m•K^3, Btu/sec•ft•$°F^3$)
W6(R)	A3 (W/m•K^4, Btu/sec•ft/$°F^4$)
W7(R)	A4 (W/m•K^5, Btu/sec•ft•$°F^5$)
W8(R)	A5 (W/m, Btu/sec•ft)
W9(R)	C (K, °F)

201MM51-99 Volumetric Heat Capacity Data

Table format:

W1(R)	temperature (K, °F)
W2(R)	volumetric heat capacity (J/m^3•K, Btu/ft^3•°F)

(HEAT STRUCTURE continued on next page)

Functional Format:

W1(R)	lower limit temperature (K, °F)
W2(R)	upper limit temperature (K, °F)
W3(R)	A0 ($J/m^3 \cdot K$, $Btu/ft^3 \cdot °F$)
W4(R)	A1($J/m^3 \cdot K^2$, $Btu/ft^3 \cdot °F^2$)
W5(R)	A2 ($J/m^3 \cdot K^3$, $Btu/ft^3 \cdot °F^3$)
W6(R)	A3 ($J/m^3 \cdot K^4$, $Btu/ft^3 \cdot °F^4$)
W7(R)	A4 ($J/m^3 \cdot K^5$, $Btu/ft^3 \cdot °F^5$)
W8(R)	A5 (J/m^3, Btu/ft^3)
W9(R)	C (K, °F)

GENERAL TABLE

202TTT00 Type and Multiplier Data

W1(A)	table type (POWER, HTRNRATE, HTC-T, HTC-TEMP, TEMP, REAC-T, NORMAREA)
W2(I)	table trip number (blank, 0, trip no)
W3-W5(R)	factors

202TTT01-99 Data

w1(R)	argument value (sec if time; K or °F if temperature; dimensionless if normalized length)
W2(R)	function value (W, Mw if power; K, °F if temperature; W/m^2, Btu/sec•ft if heat transfer rate; $W/m^2 \cdot K$, Btu/sec•ft^2•°F if heat transfer coefficient; dollars if reactivity; dimensionless if normalized area)

CONTROL COMPONENT--GENERAL

205NNN00 Type Card

W1(A)	alphanumeric name
W2(A)	control component type (SUM, MULT, DIV, DIFFRENI, DIFFREND, INTEGRAL, FUNCTION, STDFNCTN, TRIPUNLT, TRIPDLAY, POWERI, POWERR, POWERX, DELETE)
W3(R)	scaling factor
W4(R)	initial value (must be $\leq$ max and > min)
W5(I)	initial value flag (0 or 1)
W6(I)	limiter control (blank, 0, 1, 2, or 3)
W7(R)	minimum or maximum value
W8(R)	maximum value

CONTROL COMPONENT DATA CARDS (205NNN01-99)

Sum-Difference Component

W1(R)	constant A0 (first card only)
W2(R)	constant AN
W3(A)	alphanumeric part of variable request code for VN
W4(I)	numeric part of variable request code for VN

Multiplier Component

W1(A)	alphanumeric part of variable request code for VN
W2(I)	integer part of variable request code for VN

Divide Component

W1(A)	alphanumeric part of variable request code for denominator

(CONTROL COMPONENT DATA CARDS continued on next page)

Divide Component (continued)

W2(I) integer part of variable request code for denominator

W3(A) alphanumeric part of variable request code for numerator

W4(I) integer part of variable request code for numerator

Differentiating Component

W1(A) alphanumeric part of variable request code for V1

W2(I) integer part of variable request code for V1

Integrating Component

W1(A) alphanumeric part of variable request code for V1

W2(I) integer part of variable request code for V1

Functional Component

W1(A) alphanumeric part of variable request code for V1

W2(I) integer part of variable request code for V1

W3(I) general table number of function

Standard Function Component

W1(A) ABS, SQRT, EXP, ALOG, SIN, COS, TAN, ATAN

W2(A) alphanumeric part of variable request code for V1

W3(I) integer part of variable request code for V1

(CONTROL COMPONENT DATA CARDS continued on next page)

Unit Trip Component

W1(I)	trip number, T1

Trip Delay Component

W1(I)	trip number, T1

Integer Power Component

W1(A)	alphanumeric part of variable request code for V1
W2(I)	integer part of variable request code for V1
W3(I)	I1

Real Power Component

W1(A)	alphanumeric part of variable request code for V1
W2(I)	integer part of variable request code for V1
W3(R)	R1

Variable Power Component

W1(A)	alphanumeric part of variable request code for base, V1
W2(I)	integer part of variable request code for base, V1
W3(A)	alphanumeric part of variable request code for exponent, V_2
W4(I)	integer part of variable request code for exponent, V_2

30000000 Type Card

W1(A)	type (POINT, DELETE)

30000001 Information Card

W1(A)	fission product decay type (NO-GAMMA, GAMMA, GAMMA-AC)
W2(R)	total reactor power (W)
W3(R)	initial reactivity (dollars)
W4(R)	delayed neutron fraction over neutron generation time (sec^{-1})
W5(R)	fission product yield factor (1.0 = best estimate, 1.2 = conservative mode)
W6(R)	actinide yield factor

30000011-20 Reactivity Curve Numbers

W1(I)	curve number from general table (up to 20)

30000101-199 Delayed Neutron Constants

W1(R)	precursor yield ratio
W2(R)	decay constant (sec^{-1})

300002U1-299 Fission Product Decay Constants

W1(R)	yield fraction
W2(R)	decay constant (sec^{-1})

(REACTOR KINETICS continued on next page)

30000301-399 Actinide Decay Constants

W1(R)	yield fraction
W2(R)	decay constant (sec^{-1})

30000401-499 Previous Power History Data

W1(R)	reactor power (W)
W2(R)	time duration (greater than or equal to 0)
W3(R)	time duration units (SEC, MIN, HR, DAYS, WK)

30000501-599 Density Reactivity Table

W1(R)	normalized water density
W2(R)	reactivity (dollars)

30000601-699 Doppler Reactivity Table

W1(R)	temperature (K or °F)
W2(R)	reactivity (dollars)

30000701-799 Volume Weighting Factors

W1(I)	Hydrodynamic volume number
W2(I)	increment
W3(R)	weighting factor for density feedback
W4(R)	water temperature coefficient (dollars/K, dollars/°F)

(REACTOR KINETICS continued on next page)

30000801-899 Heat Structure Weighting Factor

W1(I)	heat structure number
W2(I)	increment
W3(R)	weighting factor for doppler feedback
W4(R)	fuel temperature coefficient (dollars/K, dollars/°F)