APPENDIX B
DESCRIPTION OF TRAC-M STRUCTURAL ELEMENTS

The information contained in this appendix was generated using the same script that generated the TRAC PathFinder. The PathFinder consists of HTML pages that may be accessed dynamically using a Web browser to view the information contained herein, as well as the applicable source coding.

Note: XTV/XMGR5 Graphics System. Module `Xtv`, which implements the XTV/XMGR5 graphics system, is to be replaced in a future version of TRAC-M/F90 by modules `CXtvXFaces`, `XtvComps`, `XtvData`, `XtvDump`, and `XtvSetup`.

Note: C Routines. The Fortran interface modules to C-language routines are included here, but not the C routines themselves.

B.1. PROGRAMs

PROGRAM:	trac
PURPOSE:	The TRAC-M main PROGRAM.
Source file:	trac.f90
USEs MODULES:	DataSgnf EngUnits GlobalDat IntrType Io SysTime TracInput
CALLs:	InitSysTime blkdat clean dmpit init input otrcsni sgnfetup steady trans

B.2. MODULEs

MODULE:	Alloc
PURPOSE:	Generic F90 dynamic allocation, initialization, and diagnostics routine to establish memory for 1D, 2D, and 3D real arrays and 1D integer arrays.
Source file:	AllocM.f90
CONTAINs:	AllocIntOneD AllocRealOneD AllocRealThreeD AllocRealTwoD
USEs MODULES:	IntrType
USEd by:	AddSegment1D AddSegment3D AllBOp AllFOp AllFillArrays AllocGen1D AllocPlenum AllocVess AllocVess3 SetSysMat allocBoundary icomp input pntrod repipe replen repump resepd retee revlve rpipe rplen rpump rsepd rtee rvlve svset1

MODULE:	Bad

PURPOSE: Initializes parameters nbd (used to dimension boundary arrays bd1 and bd2) and bdfull (used by the PLENUM and VESSEL components).
Source file: BadM.f90
USEs MODULES: IntrType
USEd by: StbVel1D SysService TeeArray allocBoundary bkmom chkbd constb elgr flux fwall htpipe inner input iplen ivssl j1d j3d plen1 plen2 plen3 poster preper rdcrvs repump resepd retee rpump rsepd rtee savbd set3dbd setbd stbme steady tee1x tf1d tf1ds tf1ds1 tf1ds3 trans vssl1 vssl2 vssl3

MODULE: BadInput
PURPOSE: Declares INTEGER variable jflag that is set to 1 if bad input data are encountered.
Source file: BadInputM.f90
USEs MODULES: IntrType
USEd by: LuMatch fbrcss hash input loadn namlst rcomp rdcomp rdrest readi readr recntl rhtstr rlevel timstp uncnvt uncnvtn unnumb unsvcb wir

MODULE: Bits
PURPOSE: Declares numerous integer parameters required for bit processing within the code.
Source file: BitsM.f90
USEs MODULES: IntrType
USEd by: EdgeAvg1D Plenum StbME3D StbVel1D bkstb3 break1 chkbd cif3 ecomp ff3d fill1 flux htif j3d poster preper rcomp set3dbd stbme stbme3 tee2 tee3 tf1ds tf1ds1 tf1ds3 tf3ds tf3ds1 tf3ds3 vssl2 vssl3

MODULE: Boundary
PURPOSE: Declares REAL fluid-component boundary arrays bd and vsi, declares integer variable bdOffset, and controls boundary memory allocation.
Source file: BoundaryM.f90
CONTAINs: allocBoundary
USEs MODULES: IntrType
USEd by: InitBDArray StbME3D TableTransComp astpln auxpln bdplen break1 break2 break3 civssl fill1 fill2 fill3 fillx ibrk icomp ifill input ipipe iplen iprizr ipump itee ivlve ivssl j3d out1d pipe1 pipe2 pipe3 plen1 plen2 plen3 prizr1 prizr2 prizr3 pump1 pump2 pump3 sepdx set3dbd stbme3 steady tbc1 tee1 tee2 tee3 tf3ds tf3ds3 tfplbk tfpln trans vlve1 vlve2 vlve3 vssl1 vssl2 vssl3 wplen

MODULE: Break
PURPOSE: Contains the BREAK component-specific routines.

Source file:	BreakM.f90
CONTAINs:	AllBOp AllBreakArrays break1 break2 break3 breakx dbrk ibrk rbreak rebrk wbreak
USEs MODULES:	BreakArray Global
USEd by:	dmpit icomp out1d post prep1d rdcomp rdrest sdmpit sgnfetup wcomp

MODULE:	BreakArray
PURPOSE:	Defines the derived-type `breakArrayT` specific to BREAK-component arrays.
Source file:	BreakArrayM.f90
USEs MODULES:	GlobalDim IntrType
USEd by:	Break xtvbrak

MODULE:	BreakVlt
PURPOSE:	Contains routines specific to the BREAK-component VLT for initial setup and clearing, loading data from and storing data in the global VLT arrays, and reading from and writing to the restart dump.
Source file:	BreakVltM.f90
CONTAINs:	BreakTableDump BreakTableRst
USEs MODULES:	Global IntrType
USEd by:	break1 break2 break3 breakx dbrk dmpVLT ibrk rbreak rebrk rstVLT wbreak xtvbrak

MODULE:	CFaces
PURPOSE:	Contains the interface for routines written in the C language (including `xtv` and C implementations for some of the Fortran 90 bit intrinsic functions) that are in file `cfiles.c`.
Source file:	CFacesM.f90
CONTAINs:	GetLocalSysInfo btestc cepsilon cxtvbw cxtvbw1 cxtvcl cxtvin cxtvoa cxtvoa1 cxtvow ibclrc ibsetc of1123c on1123c (These routines are within the INTERFACE.)
USEd by:	EdgeAvg1D Linear StbME3D StbVel1D StbVelx StbVely StbVelz Xtv auxpln bkstb3 break1 chkbd cif3 ecomp ff3d fill1 flux htif init initbc inner ivssl j3d out1d plen3 poster prep1d preper rcomp rvssl set3dbd sgnf3d stbme stbme3 tee2 tee3 tf1ds tf1ds1 tf1ds3 tf3ds tf3ds1 tf3ds3 tfplbk tfpln velbc vssl2 vssl3

MODULE:	CXtvXFaces
PURPOSE:	C interface for routines contained in file `Cxtvxdr.c`.
Source file:	CXtvXFacesM.f90
CONTAINs:	cxtvxarrupd cxtvxbrak cxtvxclose cxtvxcntl cxtvxdata cxtvxdatainit cxtvxfill cxtvxgd1a cxtvxgd1b cxtvxgd1c cxtvxgd1d cxtvxgnpr cxtvxhtr1 cxtvxhtr2 cxtvxhtr3 cxtvxhtr4 cxtvxhtr5 cxtvxhtr6 cxtvxhts1 cxtvxhts2 cxtvxopn cxtvxpln1 cxtvxpln2 cxtvxpln3 cxtvxsa2d cxtvxss1d cxtvxst1d cxtvxstart cxtvxsu1d cxtvxsv1d cxtvxupdcnts cxtvxvard cxtvxvcnt cxtvxvsl1 cxtvxvsl2 cxtvxvsl3 (These routines are within the INTERFACE.)
USEd by:	Xtv clean

MODULE:	Ccfl
PURPOSE:	Declares parameters, integer and real variables for the CCFL model.
Source file:	CcflM.f90
USEs MODULES:	IntrType
USEd by:	StbVel1D StbVelz dmpit input rcomp rdrest rvssl tf1ds1 tf3ds1
MODULE:	CompTyp
PURPOSE:	Initializes component-type parameters and controls the setting and return of component types.
Source file:	CompTypM.f90
CONTAINs:	gettype settype
USEs MODULES:	IntrType
USEd by:	AllocGen1D Control DataSgnf InitBDArray Sepd StbVel1D SysService Xtv blkdat chkbd civssl compi constb core1 dcomp dmpVLT dmpit elgr error fltom flux fwall htcor htif htstr1 htstrp htstrv htvssl icomp ihpss1 ihpss3 inner input iplen irod irodl j1d junsol out1d out3d post post3d poster prep1d prep3d preper rbreak rdcomp rdrest rebrk refill rehtst repipe replen reprzr repump retee revlve revssl rfdbk rfill rhtstr rodht rpipe rplen rprizr rpump rstVLT rtee rvlve rvssl srtlp stbme tee1 tee2 tee3 tf1ds tf1ds1 tf1ds3 wcomp whtstr wtee zpwnrm zpwrci
MODULE:	Control
PURPOSE:	Contains the control system-specific routines.
Source file:	ControlM.f90
CONTAINs:	cbedit cbset conblk delay evfxxx evltab fbrcss order rcntl recntl svset svset1 svset3 svseth trip trips trpset
USEs MODULES:	CompTyp ControlDat EngUnits Global GlobalDat GlobalPnt IntrType Io Temp
USEd by:	breakx core1 dmpit fillx input pipe1 pipe3 prep pump3 pumpsr rdrest rkin tee1x tee3 timstp vlve3 vlvex wpump
MODULE:	ControlDat
PURPOSE:	Declares Control-System-derived types and controls: the allocation of Control-System memory, deallocation of Control-System memory required only to read the restart file, and reading from and writing to the dump restart file.
Source file:	ControlDatM.f90
CONTAINs:	CSDump CSFree CSRestart CSSetLuIdx
USEs MODULES:	IntrType
USEd by:	Control DataSgnf Xtv break1 core3 edit init rcomp rfill rhtstr rpump rvlve sepd1 steady timchk trans unsvcb wbreak wcomp
MODULE:	DataSgnf

PURPOSE:	Controls data significance edits.
Source file:	DataSgnfM.f90
CONTAINs:	otrcsni rsgnf sdmpit sgnf1d sgnf3d sgnfetup sgnfpipe sgnfplen sgnfprzr sgnfpump sgnftee sgnfvlve sgnfvol1d sgnfvol3d sgnhtstr vsgnfpipe vsgnfplen vsgnfprzr vsgnfpump vsgnftee vsgnfvlve vsgnhtstr
USEs MODULES:	CompTyp ControlDat Flt Global GlobalDat GlobalDim GlobalPnt IntrType
USEd by:	pstepq trac

MODULE:	EngUnits
PURPOSE:	Initializes variables for and controls the conversion of English/SI units.
Source file:	EngUnitsM.f90
CONTAINs:	InitLabels LuMatch uncnvt uncnvtn uncnvts unnumb
USEs MODULES:	IntrType
USEd by:	CSSetLuIdx Control WriteSim2DArray WriteStSumV1 WriteStaticV1 WriteStaticV3 WriteValAs2DArray WriteValAsArray WriteValAsSArray Xtv core1 dmpit ecomp edit elgr error hash hout htstr1 ihpss1 ihpss3 input irod ivssl namlst rcomp rdrest readr reecho rehtst rerod1 rfill rhtstr rpipe rpump rrod1 rrod2 rsepd rtee rvlve rvssl sedit steady timstp trac unsvcb warray wbreak wcomp wfill whtstr wlevel wmxytb wpipe wplen wprizr wpump wsepd wtee wvlve wvssl

MODULE:	Eos
PURPOSE:	Contains all equation-of-state (EOS) data and routines for fluids.
Source file:	EosM.f90
USEs MODULES:	EosData EosInline EosNoInline
USEd by:	Fprop3D Htif3D StbVelx StbVely StbVelz Therm3D bkspln bksstb bkstb3 break1 break3 breakx chen chf choke core1 dmpit fillx gvssl2 htcor htif htvssl hvwebb ibrk ifill ihpss1 ihpss3 input iplen iprop ivssl mgap namlst plen2 plen3 poster preper rbreak rcomp rdrest revssl rpump rvlve rvssl tf1d tf1ds tf1ds3 tf3ds tf3ds1 tf3ds3 tfplbk tfpln vssl2 vssl3 whtstr

MODULE:	EosData
PURPOSE:	Declares EOS variables.
Source file:	EosDataM.f90
USEs MODULES:	IntrType Io
USEd by:	Eos EosInline EosNoInline

MODULE:	EosInline
PURPOSE:	Contains fluid EOS routines that support the Cray F90 `modinline` and `inlinefrom` optimization options.
Source file:	EosInlineM.f90
CONTAINs:	hevh rholih satdeh satprh sattmh
USEs MODULES:	EosData
USEd by:	Eos EosNoInline

MODULE:	EosNoInline
PURPOSE:	Contains fluid EOS routines that do not support the Cray F90 `modinline` and `inlinefrom` optimization options.
Source file:	EosNoInlineM.f90
CONTAINs:	cpll cplld cpllh cpvv1 cpvv1d cpvv1h hev hevd fprop fpropd fproph rholid rholiq satded satder satprd satprs sattmd sattmp seteod seteoh seteos sigma sound thcl thcld thclh thcv thermd thermh thermo therms viscl viscld visclh viscv viscvd viscvh
USEs MODULES:	EosData EosInline
USEd by:	Eos

MODULE:	EvalDF
PURPOSE:	Contains difference evaluation routines used to calculate the TRAC timestep.
Source file:	EvalDFM.f90
CONTAINs:	evaldf1d evaldf2d
USEs MODULES:	IntrType TimeStepDat
USEd by:	Evaldf3D core3 pipe3 prizr3 pump3 tee3 vlve3

MODULE:	FailDat
PURPOSE:	Declares variables used in error processing.
Source file:	FailDatM.f90
USEs MODULES:	IntrType
USEd by:	bkspln bksstb bkstb3 hout input namlst newdlt outer post tf1ds3 tf3ds3 tfplbk timstp

MODULE:	Fill
PURPOSE:	Contains the FILL-component-specific routines.
Source file:	FillM.f90
CONTAINs:	AllFOp AllFillArrays dfill fill1 fill2 fill3 fillx ifill refill rfill wfill
USEs MODULES:	FillArray Global
USEd by:	dmpit icomp out1d post prep1d rdcomp rdrest sdmpit sgnfetup wcomp

MODULE:	FillArray
PURPOSE:	Defines the derived-type `fillArrayT` specific to FILL-component arrays.
Source file:	FillArrayM.f90
USEs MODULES:	GlobalDim IntrType
USEd by:	Fill xtvfill

MODULE:	FillVlt
PURPOSE:	Contains routines specific to the FILL-component VLT for initial setup and clearing, loading data from and storing data in the global VLT arrays, and reading from and writing to the restart dump file.
Source file:	FillVltM.f90
CONTAINs:	FillTableDump FillTableRst
USEs MODULES:	Global IntrType
USEd by:	dfill dmpVLT fill1 fill2 fill3 fillx ifill ihpss1 refill rfill rstVLT wfill xtvfill

MODULE:	Flt
PURPOSE:	Contains routines for the FLT that is generic to all component types for performing initial setup, retrieving selected data, and reading from and writing to the restart dump file.
Source file:	FltM.f90
CONTAINs:	GenTableDump GenTableRst GetGenTable
USEs MODULES:	Global IntrType
USEd by:	AllocGen1D CheckAcc DataSgnf EdgeAvg1D Sepd StbVel1D SysService bdplen bkspln bksstb bkstb3 break1 break2 break3 breakx chen chkbd cihtst civssl compi constb core1 core3 dbrk dcomp dfill dhtstr dmpit dplen dprizr drod1 dtee dvssl ecomp elgr error evaldf1d evaldf2d fill1 fill2 fill3 fillx fwall htcor htif htpipe htstr1 htstr3 htstrp htstrv htvssl ibrk icomp ifill ihpss1 ihpss3 inner input ipipe iplen iprizr iprop ipump irod irodl itee ivlve ivssl iwall3 jbd4 junsol lchpip out1d out3d pipe1 pipe3 plen3 pntrod post post3d poster prep1d prep3d preper prizr1 prizr3 pump1 pump3 pumpsr rbreak rcomp rdcomp rdrest rebrk refill rehtst repipe replen reprzr repump rerod1 retee revlve revssl rfill rhtstr rpipe rplen rprizr rpump rrod1 rrod2 rtee rvlve rvssl savbd setbd svset svset1 svset3 svseth tee1 tee2 tee3 tf1ds tf1ds1 tf1ds3 tf3ds tf3ds1 tf3ds3 tfplbk vlve1 vlve3 vlvex vssl1 vssl2 vssl3 vssrod vssssr wbreak wcomp wfill whtstr wpipe wplen wprizr wpump wrcomp wtee wvlve wvssl xtv1d xtvbrak xtvdr xtvfill xtvht

MODULE:	Gen1DArray
PURPOSE:	Contains routines for accessing generic 1D-component arrays, including initializing parameters for array pointers, declaring derived types for the pointers, allocating memory, loading a scalar EOS derivative, determining the pointers for 1D and 2D generic arrays, and resetting the generic 1D-component arrays for timestep update and backup.
Source file:	Gen1DArrayM.f90
CONTAINs:	AllocGen1D BackUpGen1D CopyGen1DArray Get1DArrayPointer Get2DArrayPointer GetEosDriv1d GetGen1D GetGen1D2D GetGen1DArray IncrementGen1D TimeUpGen1D
USEs MODULES:	GlobalDim IntrType
USEd by:	AllocPlenum BackUpPlen CheckAcc SetJunAvgPtrs SysService TimeUpPlen astpln bdplen bkmom bkspln break1 break2 break3 breakx chkbd compi constb dbrk dcomp dfill dplen dprizr ecomp fill1 fill3 fillx htpipe ibrk ifill ihpss1 ihpss3 inner ipipe iplen iprizr iprop ipump itee ivlve j1d out1d pipe1 pipe3 piprod plen1 plen2 plen3 poster preper prizr1 prizr3 przr1x pump3 rbreak rcomp rebrk recomp refill repipe replen reprzr repump resepd retee revlve rfill rpipe rplen rprizr rpump rsepd rtee rvlve savbd sepd2 sepd3 sepdi sepdx sgnf1d sgnfpipe sgnfplen sgnfprzr sgnfpump sgnftee sgnfvlve sgnfvol1d stbmpl svset1 tee1 tee2 tee3 tf1d tfplbk tfpln vlve1 vlve3 vlvex vsgnfplen vssl2 wplen wrcomp wvlve xtv1d xtvbrak xtvfill xtvpipe xtvplen xtvprzr xtvpump xtvtee xtvvalv

MODULE:	Gen1DCrunch
PURPOSE:	Contains worker routines applicable to generic 1D-component arrays, where the access to the array database is through the argument interface.
Source file:	Gen1DCrunchM.f90
CONTAINs:	CellFluxes CellLogic EdgeAvg1D StbVel1D IndAob bksmom bksstb choke cylht flux fwall level mprop powint stbme tf1ds tf1ds1 tf1ds3 volv
USEs MODULES:	IntrType
USEd by:	bkmom constb offtke poster preper tf1d

MODULE:Gen1DInit

PURPOSE:	Contains all routines for initializing and loading generic 1D-component arrays.
Source file:	Gen1DInitM.f90
CONTAINs:	CheckAcc chbd chkbd compi elgr iprop junsol volfa
USEs MODULES:	IntrType
USEd by:	ipipe iprizr ipump itee ivlve

MODULE:	Gen1DTask
PURPOSE:	Contains task management routines applicable to generic 1D-component arrays that access the global database.
Source file:	Gen1DTaskM.f90
CONTAINs:	bkmom cellav constb htpipe ihpss1 inner j1d poster preper savbd setbd tf1d
USEs MODULES:	IntrType
USEd by:	break1 break2 break3 fill1 fill2 fill3 ibrk icomp ifill ipipe iprizr ipump itee ivlve jbd4 pipe1 pipe2 pipe3 prizr1 prizr2 prizr3 pump1 pump2 pump3 rpipe rprizr rpump rsepd rtee rvlve tee1 tee2 tee3 vlve1 vlve2 vlve3

MODULE:	GenHeat
PURPOSE:	Contains routines that calculate the interfacial heat transfer at each cell center.
Source file:	GenHeatM.f90
CONTAINs:	htif
USEs MODULES:	IntrType
USEd by:	Htif3D Plenum tf1d vssl2

MODULE:	Global
PURPOSE:	Declares global variables (i.e., those that apply to the overall calculation).
Source file:	GlobalM.f90
USEs MODULES:	GlobalDim IntrType
USEd by:	AllocGen1D BackUpGen1D BackUpPlen Break BreakVlt CellFluxes CellLogic Control DataSgnf EdgeAvg1D Fill FillVlt Flt GenJunInfo Get1DArrayPointer Get2DArrayPointer GetEosDriv1d GetHS1DPtr GetHS2DPtr GetHS3DPtr GetHeatArray GetNoht JunTerms PipeVlt PlenVlt Plenum PrizeVlt Pump PumpVlt RodVlt Sepd SepdVlt SetSysMat SetSysVar SysService Tee TeeVlt TimeUpGen1D TimeUpHS TimeUpHS1 TimeUpPlen Valve ValveVlt VessVlt Xtv bfclos bfin bfinn bfout bfoutn bkmom bksmom chkbd cihtst civssl compi constb core1 dcomp dhtstr dmpVLT dmpit drod1 dvssl ecomp edit fltom hout htpipe htstr1 htstr3 htstrv icomp ihpss1 ihpss3 init inner input iprizr ivssl j1d lchvss numtoicomp out1d out3d outer pipe1 piprod pntrod post post3d poster prep prep3d preper prizr1 pumpd pumpsr pumpx rbreak rcomp rdcomp rdrest rebrk recomp refill rehtst rerod1 revssl rfill rhtstr rpipe rrod2 rtee rvssl sedit stbme tf1d vssl2 vssl3 vssrod wcomp whtstr wrcomp

MODULE:	GlobalDat
PURPOSE:	Declares and initializes global variables (i.e., those that apply to the overall calculation).
Source file:	GlobalDatM.f90

USEs MODULES: IntrType

USEd by: AllocGen1D AllocVess BlockSolver CellFluxes CellLogic CheckAcc ClearFluxSums Control DataSgnf EdgeAvg1D JunTerms Plenum PressCoef3D PrizeTableDump Sepd SetSysMat StbME3D StbVel1D StbVelx StbVely StbVelz Xtv bkmom bksmom bksstb bkstb3 break1 break2 break3 breakx chen chkbd cif3 compi constb core1 core3 courno cpvv1d cpvv1h dcomp dhtstr dmpit dprizr drod1 dvssl ecomp edit elgr error ff3d fill1 fill2 fill3 fillx fltom fluxes frod gvssl2 hout htcor htif htpipe htstr1 htstr3 htstrp htstrv htvssl ibrk icomp ifill ihpss1 ihpss3 init inner input ipipe iprizr iprop ipump irod irodl itee ivlve ivssl iwall3 j3d namlst newdlt out1d out3d outer pipe1 pipe2 pipe3 piprod plen1 plen2 plen3 post post3d poster prep prep1d prep3d preper prizr1 prizr2 prizr3 pstepq pump1 pump2 pump3 pumpsr rbreak rcomp rdcomp rdrest rebrk recomp refill rehtst retee revssl rfdbk rfill rhtstr rkin rpipe rpump rtee rvlve rvssl savbd sedit set3dbd stbme stbme3 steady t tee1 tee1x tee2 tee3 tf1d tf1ds tf1ds1 tf1ds3 tf3ds tf3ds1 tf3ds3

MODULE: GlobalDim

PURPOSE: Declares and initializes global variables (i.e., those that apply to the overall calculation).

Source file: GlobalDimM.f90

USEs MODULES: IntrType

USEd by: BlockSolver BreakArray BuildBndryTable DataSgnf Evaldf3D FillArray Fprop3D Gen1DArray GenJunInfo Global HSArray HeatArray Htif3D InitBDArray IntArray PipeArray PlenArray Plenum PressCoef1D PressCoef3D PumpArray SetSysMat Solver StbME3D StbVelx StbVely StbVelz TeeArray Therm3D ValveArray VessArray VessArray3 bksstb break1 break3 civssl dbrk dcomp dfill dvssl fillx fprop fpropd fproph htif htpipe ipipe iprizr ipump irodl itee ivlve junsol lchpip matsol namlst piprod prefwd preinp prep1d pumpsr rcomp repipe reprzr repump rerod1 resepd retee revlve rprizr rpump rrod2 rvlve savbd sepdi srtlp stbme3 steady tf1ds tf1ds1 tf1ds3 tf3ds3 thermd thermh thermo therms trans vssl1 warray wcomp wmxytb wvssl

MODULE: GlobalPnt

PURPOSE: Declares pointers for the global variables (i.e., those that apply to the overall calculation).

Source file: GlobalPntM.f90

USEs MODULES: IntrType

USEd by: Control DataSgnf Plenum Xtv bkmom break1 cihtst civssl constb core1 core3 dhtstr dmpit edit fillx fltom hout htstr1 htstr3 htstrv icomp ihpss1 ihpss3 init input iprop ivssl numtoicomp out1d out3d outer post post3d poster prep prep1d prep3d preper pumpsr rcomp rdcomp rdrest rehtst revssl rfill rhtstr rpump rvlve rvssl sedit steady

tee1 tf1d timchk timstp trans unsvcb vlvex vssl1 vssl2 vssl3 vssssr wbreak wcomp whtstr

MODULE:HSArray

PURPOSE:	Contains routines for accessing generic HTSTR arrays, including initialization of parameters for array pointers, declaration of derived types for the pointers, determination of the pointers for 1D, 2D, and 3D heat-structure arrays, and resetting the generic heat-structure arrays for timestep update.
Source file:	HSArrayM.f90
CONTAINs:	GetHS GetHS1DPtr GetHS2DPtr GetHS3DPtr GetHS2d GetHS3d GetHSSurf GetNoht TimeUpHS TimeUpHS1
USEs MODULES:	GlobalDim IntrType
USEd by:	RodTask sgnhtstr svseth vsgnhtstr xtvht

MODULE:	HeatArray
PURPOSE:	Contains routines for accessing variables specific to heated components, including initialization of parameters for array pointers and determination of the pointers for heated-component arrays.
Source file:	HeatArrayM.f90
CONTAINs:	GetHeatArray
USEs MODULES:	GlobalDim IntrType
USEd by:	AllocGen1D compi ecomp itee pipe1 poster preper prizr1 pump1 svset1 tee1 vlve1

MODULE:	HeatCor
PURPOSE:	Contains correlations and routines involving heat transfer.
Source file:	HeatCorM.f90
CONTAINs:	chen chf chf1 hlfilm htcor hvfilm hvnb tmsfb
USEs MODULES:	IntrType
USEd by:	RodCrunch htpipe

MODULE:	HpssDat
PURPOSE:	Declares the derived type for HPSS variables.
Source file:	HpssDatM.f90
USEs MODULES:	IntrType
USEd by:	icomp ihpss1 ihpss3 input rcomp

MODULE:	IntArray
PURPOSE:	Declares the derived type for integer-component-specific arrays.
Source file:	IntArrayM.f90
USEs MODULES:	GlobalDim IntrType

USEd by: AllocGen1D chkbd dcomp dtee ecomp htpipe ipipe iprizr ipump itee ivlve poster preper rcomp recomp repipe reprzr repump resepd retee revlve rpipe rprizr rpump rsepd rtee rvlve tf1d wrcomp xtv1d xtvpipe xtvprzr xtvpump xtvtee xtvvalv

MODULE: IntrType

PURPOSE: Invokes F90 intrinsics to determine the INTEGER and REAL KINDs (represented as integer parameters) `sdk` and `sik`, respectively, required to declare variables with the desired precision and range.

Source file: IntrTypeM.f90

USEd by: Alloc AssignGen1DPtr Bad BadInput Bits Boundary BreakArray BreakVlt BuildBndryTable Ccfl CheckAcc CompTyp Control ControlDat DataSgnf EngUnits EosData EvalDF FailDat FillArray FillVlt Flt Gen1DArray Gen1DCrunch Gen1DInit Gen1DTask GenHeat GetIntTeeFace Global GlobalDat GlobalDim GlobalPnt HSArray HeatArray HeatCor HpssDat IntArray Io JCIndex JunTerms Linear Matrices Network OneDDat PipeArray PipeVlt PlenArray PlenVlt Plenum PreInput PrizeVlt Prizer PumpArray PumpSource PumpVlt ReadEcho Restart RodCrunch RodGlobal RodHtcref1 RodTask RodVlt SemiSolver Sepd SepdVlt SetBDJunCell SetMat SysConfig SysService SysTime TableTransComp TableTransJC TableTransfer TeeArray TeeVlt Temp TextIo Thermocple TimeStep TimeStepDat TracInput Util ValveArray ValveVlt VectDrag VessArray VessArray3 VessCon VessMat VessStbME VessTask VessTf3dc VessTo1D VessVlt Xtv Xvol bfaloc blkdat break1 break2 break3 breakx checksize clean cleari dbrk dcomp dfill dmpVLT dmpit dpipe dpump dtee dvlve ecomp edit error etee faxpos fill1

MODULE: Io

PURPOSE: Declares and initializes variables specific to data input/output.

Source file: IoM.f90

USEs MODULES: IntrType

USEd by: CSSetLuIdx Control EosData InitLabels LuMatch Plenum StbVel1D TextIo Xtv bansol breakx chen chf chksr cihtst clean core1 dmpit ecomp edit elgr error fillx hash hout htcor htstr1 htvssl hvwebb ibrk icomp ihpss1 ihpss3 init input irod irodl ivlve ivssl junsol lchpip lchvss mfrod mstrct namlst newdlt nxtcmp out3d outer post post3d preinp prep1d prep3d pstepq pumpd pumpsr pumpx rbreak rcomp rdcomp rdcrds rdrest readi readr rebrk reecho refill rerod1 resepd retee revssl rfill rhtstr rlevel rpipe rprizr rpump rrod1 rrod2 rsepd rtee rvlve rvssl sclmom sedit sepd1 split srtlp steady tf1ds3 tf3ds tf3ds3 timstp trac trans uncnvt uncnvtn unnumb unsvcb volfa vssl2 wbreak wcomp wfill whtstr wir wlabi wlabin wlabr wlabrn wlevel wmxytb wpipe wprizr wpump wsepd wtee wvlve wvssl

MODULE:	JunTerms
PURPOSE:	Isolates subroutines and data associated with contributions to the flow equations from junctions between mesh segments (includes junctions between components). Pointers in the data structure are set by subroutine `SetJunAvgPtrs` and are private to this module.
Source file:	JunTermsM.f90
CONTAINs:	AssocJunPtrs DpJun JunCoefDp JunFluxes1D PressCoefJun1D PressCoefJun3D SetJunAvgPtrs StbME3DJun StbMEJun StbVel3DJun
USEs MODULES:	Global GlobalDat IntrType Matrices SysConfig Xvol
USEd by:	SemiSolver init post post3d prep tf1d

MODULE:	Linear
PURPOSE:	Contains routines that solve systems of linear equations.
Source file:	LinearM.f90
CONTAINs:	SAXPYT SDOTT SSCALT balanct balbakt daxpy ddot dgbfa dgbsl dscal hqr2t hqrt idamax matsol orthest ortrant sasumt scopym scopyt sfa22v sfa33v sfa44 sfa44v sfa55 sfa55v sgecot sgedit sgeev sgefat sgefst sgeslt ssl22v ssl33v ssl44 ssl44v ssl55 ssl55v
USEs MODULES:	CFaces IntrType
USEd by:	BlockSolver Solver bkspln bksstb bkstb3 choke ihpss3 out3d outer post post3d prep1d prep3d tf1ds tf3ds tfpln vssl2

MODULE:	Matrices
PURPOSE:	Data and subroutines in this module are associated directly with the solution of the equations for the dynamics of the fully linked physical system being modeled. As such, much of the data structure and programming is linked directly to the choice of solution method and will need to be replaced if a new solution method is chosen or the underlying set of equations is significantly altered. However, much of this data structure reflects the types of matrix sparsity typical in the physical systems modeled by this program and should be understood before being replaced.
Source file:	MatricesM.f90
CONTAINs:	ClearFluxSums EqnSubstitute SetCenPointers SetEdgPointers SetNetPointers Solver Trisolve
USEs MODULES:	IntrType
USEd by:	CellFluxes CellLogic EdgeAvg1D JunTerms PressCoef3D SemiSolver SetMat StbME3D StbVel1D VessStbVel bksmom bkspln bksstb bkstb3 post prep stbme stbmpl tf1ds tf1ds3 tf3ds tf3ds3 tfplbk tfpln vssl3

MODULE:	Network
PURPOSE:	Declares and allocates memory for variables related to the network of components.

Source file: NetworkM.f90
CONTAINs: allocNet
USEs MODULES: IntrType
USEd by: bkmom constb hout icomp outer plen2 plen3 post post3d poster prep1d prep3d preper tf1d vssl2 vssl3

MODULE: OneDDat
PURPOSE: Declares variables for 1D components and contains a routine to clear same.
Source file: OneDDatM.f90
CONTAINs: cleardf1dc
USEs MODULES: IntrType
USEd by: GetIntTeeFace StbVel1D bkmom bksmom bkspln bksstb break1 break2 break3 constb etee fwall fwkf htif htpipe icomp inner iplen itee jbd4 out1d out3d outer pipe1 pipe2 pipe3 plen1 plen2 plen3 post post3d poster prep prep1d prep3d preper prizr1 prizr2 prizr3 pump1 pump2 pump3 pumpsr rttr sclmom sepd1 sepd2 sepd3 stbme stbmpl tee1 tee2 tee3 teemet teemf1 teex tf1d tf1ds tf1ds1 tf1ds3 tfplbk tfpln vlve1 vlve2 vlve3 vssl1 vssl2 vssl3

MODULE: Pipe
PURPOSE: Contains the PIPE-component-specific routines.
Source file: PipeM.f90
CONTAINs: dpipe ipipe pipe1 pipe1x pipe2 pipe3 repipe rpipe wpipe
USEs MODULES: PipeArray
USEd by: dmpit icomp out1d post prep1d rdcomp rdrest sdmpit sgnfetup wcomp

MODULE: PipeArray
PURPOSE: Defines the derived-type `pipeArrayT` specific to PIPE-component arrays.
Source file: PipeArrayM.f90
USEs MODULES: GlobalDim IntrType
USEd by: Pipe

MODULE: PipeVlt
PURPOSE: Contains routines specific to the PIPE component VLT for initial setup and clearing, loading data from and storing data in the global VLT arrays, and reading from and writing to the restart dump file.
Source file: PipeVltM.f90
CONTAINs: PipeTableDump PipeTableRst
USEs MODULES: Global IntrType
USEd by: dmpVLT dpipe ipipe pipe1 pipe1x pipe2 pipe3 repipe rpipe rstVLT sgnfpipe vsgnfpipe wpipe xtvpipe

MODULE:	PlenArray
PURPOSE:	Defines the derived-type `plenumArrayT` specific to PLENUM-component arrays.
Source file:	PlenArrayM.f90
USEs MODULES:	GlobalDim IntrType
USEd by:	Plenum SetBDJunCell SysService xtvplen

MODULE:	PlenVlt
PURPOSE:	Contains routines specific to the PLENUM-component VLT for initial setup and clearing, loading data from and storing data in the global VLT arrays, and reading from and writing to the restart dump file.
Source file:	PlenVltM.f90
CONTAINs:	PlenTableDump PlenTableRst
USEs MODULES:	Global IntrType
USEd by:	AllocPlenum InitBDArray SetBDJunCell astpln auxpln bdplen bkspln dmpVLT dplen iplen plen1 plen2 plen3 replen rplen rstVLT stbmpl tfplbk tfpln wplen xtvplen

MODULE:	Plenum
PURPOSE:	Contains the PLENUM-component-specific routines.
Source file:	PlenumM.f90
CONTAINs:	AllocPlenum BackUpPlen TimeUpPlen astpln auxpln bdplen bkspln dplen iplen plen1 plen2 plen3 replen rplen stbmpl tfplbk tfpln wplen
USEs MODULES:	Bits GenHeat Global GlobalDat GlobalDim GlobalPnt IntrType Io PlenArray
USEd by:	dmpit icomp out1d post prep1d rdcomp rdrest sdmpit sgnfetup wcomp

MODULE:	PreInput
PURPOSE:	Converts free-format TRACIN to standard TRAC format; writes same to file TRCINP. Makes initial error-detection pass for TRACIN.
Source file:	PreInputM.f90
CONTAINs:	allblk hunts idel indel preinp value
USEs MODULES:	IntrType
USEd by:	input

MODULE:	PrizeVlt
PURPOSE:	Contains routines specific to the PRESSURIZER component VLT for initial setup and clearing, loading data from and storing data in the global VLT arrays, and reading from and writing to the restart dump file.
Source file:	PrizeVltM.f90
CONTAINs:	PrizeTableDump PrizeTableRst

USEs MODULES:	Global IntrType
USEd by:	dmpVLT dprizr iprizr prizr1 prizr2 prizr3 przr1x reprzr rprizr rstVLT sgnfprzr vsgnfprzr wprizr xtvprzr
MODULE:	Prizer
PURPOSE:	Contains the PRESSURIZER-component-specific routines.
Source file:	PrizerM.f90
CONTAINs:	dprizr iprizr prizr1 prizr2 prizr3 przr1x reprzr rprizr wprizr
USEs MODULES:	IntrType
USEd by:	dmpit icomp out1d post prep1d rdcomp rdrest sdmpit sgnfetup wcomp
MODULE:	Pump
PURPOSE:	Contains the PUMP-component-specific routines.
Source file:	PumpM.f90
CONTAINs:	dpump ipump pump1 pump2 pump3 pumpi rdcrvs rddim repump rpump wpump
USEs MODULES:	Global PumpArray
USEd by:	dmpit icomp out1d post prep1d rdcomp rdrest sdmpit sgnfetup wcomp
MODULE:	PumpArray
PURPOSE:	Defines the derived-type `pumpArrayT` specific to PUMP-component arrays.
Source file:	PumpArrayM.f90
USEs MODULES:	GlobalDim IntrType
USEd by:	Pump pumpd pumpsr pumpx
MODULE:	PumpSource
PURPOSE:	Contains routines to calculate pump characteristics from input curves.
Source file:	PumpSourceM.f90
CONTAINs:	getcrv pumpd pumpsr pumpx split
USEs MODULES:	IntrType
USEd by:	preper
MODULE:	PumpVlt
PURPOSE:	Contains routines specific to the PUMP component VLT for initial setup and clearing, loading data from and storing data in the global VLT arrays, and reading from and writing to the restart dump file.
Source file:	PumpVltM.f90
CONTAINs:	GetPumpTab PumpTableDump PumpTableRst
USEs MODULES:	Global IntrType

USEd by:	dmpVLT dpump ipump pump1 pump2 pump3 pumpd pumpsr pumpx repump rpump rstVLT sgnfpump svset1 vsgnfpump wpump xtvpump
MODULE:	ReadEcho
PURPOSE:	Contains routines to read data from the input and dump restart files and to echo same to the TRCOUT file.
Source file:	ReadEchoM.f90
CONTAINs:	readi readr reecho wir
USEs MODULES:	IntrType
USEd by:	input rbreak rcntl rdcrds rddim rebrk recntl refill rehtst repipe replen reprzr repump resepd retee revlve revssl rfill rhtstr rpipe rplen rprizr rpump rrod1 rsepd rtee rvlve rvssl timstp
MODULE:	Restart
PURPOSE:	Contains low-level routines specific to processing restart dump file, including reading data from disk, writing data to disk, emptying buffers, and closing the dump restart file.
Source file:	RestartM.f90
CONTAINs:	bfclos bfin bfinis bfinn bfinni bfins bfout bfoutis bfoutn bfoutni bfouts enddmp
USEs MODULES:	IntrType
USEd by:	AllBOp AllFOp BreakTableDump BreakTableRst CSDump CSRestart FillTableDump FillTableRst GenTableDump GenTableRst PipeTableDump PipeTableRst PlenTableDump PlenTableRst PrizeTableDump PrizeTableRst PumpTableDump PumpTableRst RodTableDump RodTableRst SepdTableDump SepdTableRst TeeTableDump TeeTableRst ValveTableDump ValveTableRst VessTableDump VessTableRst blkdat clean dbrk dcomp dfill dhtstr dlevel dmpit dpipe dplen dpump drod1 dtee dvlve dvssl pstepq rdrest rebrk recomp refill rehtst repipe replen reprzr repump rerod1 resepd retee revlve revssl steady timchk timstp
MODULE:	RodCrunch
PURPOSE:	Contains worker routines applicable to the ROD-component arrays, where the access to the array database is through the argument interface.
Source file:	RodCrunchM.f90
CONTAINs:	bansol cdthex decays deltar expand fnmesh frod fthex gapht hlflmr htvssl hvwebb irodl lchpip lchvss mbn mfrod mfuel mgap mhtr mwrx mzirc rfdbk rkin rodht rrod1 shrink trislv zcore zpwhci zpwnrm zpwrci
USEs MODULES:	HeatCor IntrType
USEd by:	RodTask

MODULE:	RodGlobal
PURPOSE:	Declares and allocates memory for arrays that specify heat structure-fluid-cell interface information and material property information for the ROD component.
Source file:	RodGlobalM.f90
CONTAINs:	allocPrptb allocWp
USEs MODULES:	IntrType
USEd by:	core1 input iprop irodl ivssl preper tf1ds3 vssl3 vssssr

MODULE:	RodHtcref1
PURPOSE:	Declares variables used to provide ROD or SLAB information from the heat-structure solution.
Source file:	RodHtcref1M.f90
USEs MODULES:	IntrType VessCon
USEd by:	core1 hlflmr hvwebb vssrod

MODULE:	RodTask
PURPOSE:	Contains task management routines applicable to ROD-component arrays that access the global database.
Source file:	RodTaskM.f90
CONTAINs:	cihtst core1 core3 dhtstr drod1 fltom htstr1 htstr3 htstrp irod piprod pntrod rehtst rerod1 rhtstr rrod2 vssrod whtstr
USEs MODULES:	HSArray IntrType RodCrunch
USEd by:	dmpit icomp post prep rdcomp rdrest wcomp

MODULE:	RodVlt
PURPOSE:	Contains routines specific to the ROD-component VLT for initial setup and clearing, loading data from and storing data in the global VLT arrays, and reading from and writing to the restart dump file.
Source file:	RodVltM.f90
CONTAINs:	GetRodTab RodTableDump RodTableRst SetRodTab
USEs MODULES:	Global IntrType
USEd by:	cihtst core1 core3 dhtstr dmpVLT drod1 fltom htstr1 htstr3 htstrp irod irodl pntrod rehtst rerod1 rhtstr rrod1 rrod2 rstVLT sdmpit sgnfetup sgnhtstr svseth vsgnhtstr whtstr xtvht

MODULE:	SemiSolver
PURPOSE:	Wrapper for subroutines specific to the creation of the pressure matrix associated with the semi-implicit equation (basic step of the SETS method).
Source file:	SemiSolverM.f90
CONTAINs:	BlockSolver PressCoef1D PressCoef3D
USEs MODULES:	IntrType JunTerms Matrices
USEd by:	outer tf1d

MODULE:	Sepd
PURPOSE:	
Source file:	SepdM.f90
CONTAINs:	dsepd isepd resepd rsepd sepd1 sepd2 sepd3 sepdi sepdx ssepor tofric tokfac wsepd
USEs MODULES:	CompTyp Flt Global GlobalDat IntrType SepdVlt Tee TeeArray TeeVlt
USEd by:	dmpit icomp out1d post prep1d rdcomp rdrest wcomp

MODULE:	SepdVlt
PURPOSE:	
Source file:	SepdVltM.f90
CONTAINs:	SepdTableDump SepdTableRst
USEs MODULES:	Global IntrType
USEd by:	Sepd dmpVLT rstVLT

MODULE:	SetMat
PURPOSE:	Contains data and subroutines necessary for the setup of systemwide linear equations. Arrays used in the module `Matrices` are allocated by subroutine `SetSysMat`, contained in this module.
Source file:	SetMatM.f90
CONTAINs:	AreContigC AreContigE EdgJun1D EdgJunCount ExtraTrid SearchI SetAdjEdgInd SetIVolAdj SetSysMat SetTridiag
USEs MODULES:	IntrType Matrices SysConfig
USEd by:	init

MODULE:	SysConfig
PURPOSE:	From the standpoint of system services such as data communication and system equation solution, the data structures are viewed from a different perspective than the standard component-based orientation. This module provides information in a readily accessible form, clearly defining the structure of data and equations and the connectivity of the system. It enables communication and translation between components and between component-based

data and systemwide data structures used in solving the dynamic equations for the coupled physical system.

Two major classes of data are defined here. First is junction data, expressing how components are connected. Second is mesh segment information. A segment is defined as a geometrically contiguous region within a component. Segments of a given type (e.g., 1D) have a natural connectivity through their end junctions with segments of the same type and may be regrouped with no impact on the internal generation and solution of equations. This data structure defines the extent and nature of such regions.

Within the 1D data class, three types are supported. The first is a general double-ended mesh, with connections to mesh segments at either end. This supports existing TRAC-M components such as PIPE, TEE, VALVE, PRIZR, and PUMP. The second type is a single-ended 1D component. In this component, the cell edge at one end of the 1D mesh is treated as having zero area and is ignored (the number of internal-edge variables equals the number of volumes). Currently, only the PLENUM operates in this mode. The first connection to the PLENUM is treated as a normal mesh edge, and the rest are side junctions (controlled by a call to `addSegment1D`). The final component type has no active internal mesh segment; rather, it acts simply as a terminating boundary condition (BREAKs and FILLS).

Source file:	SysConfigM.f90
CONTAINs:	AddSegment1D AddSegment3D Adj1DEdge Adj3DEdge CheckOtherSeg FindMeshEnd GenJunInfo InteriorJunNum JunCellsIndex Junctions Set3DSysVar SetSegment SetSysVar StartBranch StartOneEnded
USEs MODULES:	IntrType
USEd by:	CellFluxes CellLogic CheckAcc EdgeAvg1D JunTerms PressCoef1D SetMat StbVel1D SysService VessStbVel bksmom bkspln bksstb bkstb3 chkbd init input prep rbreak rebrk refill repipe replen reprzr repump resepd retee revlve revssl rfill rpipe rplen rprizr rpump rsepd rtee rvlve rvssl stbme stbmpl tf1ds tf1ds3 tf3ds3 tfplbk tfpln
MODULE:	SysService
PURPOSE:	Wrapper for the subroutines and special data directly associated with the communication of information between components.
Source file:	SysServiceM.f90
CONTAINs:	AssignGen1DPtr BuildBndryTable GetIntTeeFace InitBDArray JCIndex SetBDJunCell SetBDVar TableTransAll TableTransComp TableTransJC TableTransfer
USEs MODULES:	Bad CompTyp Flt Gen1DArray Global IntrType PlenArray SysConfig TeeArray TeeVlt VessArray VessArray3
USEd by:	auxpln break1 break2 break3 civssl constb fill1 fill2 fillx hout ibrk icomp ifill init inner ipipe iplen iprizr ipump itee ivlve ivssl outer pipe1 pipe2 pipe3 plen1 plen2 plen3 post post3d prep3d prizr1

prizr2 prizr3 pump1 pump2 pump3 set3dbd stbme3 steady tbc1 tee1 tee2 tee3 tf3ds trans vlve1 vlve2 vlve3 vssl1 vssl2 vssl3

MODULE: SysTime
PURPOSE: Contains routines to provide system times.
Source file: SysTimeM.f90
CONTAINs: GetSysTime InitSysTime printClock startClock stopClock
USEs MODULES: IntrType
USEd by: dmpit error hout pstepq sedit timchk trac xtvGnPr

MODULE: Tee
PURPOSE: Contains the TEE-component-specific routines.
Source file: TeeM.f90
CONTAINs: dtee etee itee jbd4 offtke retee rtee tbc1 tee1 tee1x tee2 tee3 teex wjcell wtee
USEs MODULES: Global TeeArray
USEd by: Sepd dmpit icomp out1d post prep1d rdcomp rdrest sdmpit sgnfetup wcomp

MODULE: TeeArray
PURPOSE: Defines the derived-type `teeArrayT` specific to TEE-component arrays.
Source file: TeeArrayM.f90
USEs MODULES: Bad GlobalDim IntrType
USEd by: Sepd SysService Tee

MODULE: TeeVlt
PURPOSE: Contains routines specific to the TEE-component VLT for initial setup and clearing, loading data from and storing data in the global VLT arrays, and reading from and writing to the restart dump file.
Source file: TeeVltM.f90
CONTAINs: GetTeeTab TeeTableDump TeeTableRst
USEs MODULES: Global IntrType
USEd by: Sepd SetBDJunCell SysService dmpVLT dtee etee icomp iplen itee retee rstVLT rtee sepdx sgnftee svset1 tee1 tee1x tee2 tee3 vsgnftee wtee xtvtee

MODULE: Temp
PURPOSE: Declares temporary scratch space.
Source file: TempM.f90
USEs MODULES: IntrType
USEd by: Control dmpit ihpss1 ihpss3 input out3d outer post post3d prep1d prep3d rdrest vssl2

MODULE:	TextIo
PURPOSE:	Contains low-level routines to process text input and output information.
Source file:	TextIoM.f90
CONTAINs:	dcodf loadn scltbl warray wiarn wlabi wlabin wlabr wlabrn wmxytb
USEs MODULES:	IntrType Io
USEd by:	elgr input pumpx rbreak rcntl rcomp rdcrvs rebrk recntl refill repipe replen repump rerod1 resepd retee revlve revssl rfill rhtstr rlevel rpipe rplen rpump rrod2 rsepd rtee rvlve rvssl wrcomp

MODULE:	Thermocple
PURPOSE:	Declares variables used by the ROD thermocouple model.
Source file:	ThermocpleM.f90
USEs MODULES:	IntrType
USEd by:	blkdat core1 core3 expand rodht

MODULE:	TimeStep
PURPOSE:	Contains routines used to control the TRAC timestep.
Source file:	TimeStepM.f90
CONTAINs:	newdlt timstp
USEs MODULES:	IntrType TimeStepDat
USEd by:	steady trans

MODULE:	TimeStepDat
PURPOSE:	Declares variables used in the TRAC timestep control.
Source file:	TimeStepDatM.f90
USEs MODULES:	IntrType
USEd by:	EvalDF TimeStep

MODULE:	TracInput
PURPOSE:	
Source file	TracInputM.f90
CONTAINs:	asign hash input isort namlst nxtcmp r2ii vmcell
USEs MODULES:	IntrType
USEd by:	trac

MODULE:	Util
PURPOSE:	Contains utility routines generic to multiple components, such as setting arrays to a constant value, performing linear interpolation, and calculating the concentration of a solute.
Source file:	UtilM.f90
CONTAINs:	clear clearn concf courno jfind jvalue linint linint0 lint4d ltopp mixprp numtoicomp rttr shiftb teemet teemf1 teemf2 teemom

USEs MODULES:	IntrType
USEd by:	StbVel1D VessCrunch VessStbVel VessTF3DS bkspln bksstb bkstb3 break1 breakx cbset cdthex core1 delay etee evfxxx evltab fillx hout htstrp ibrk ifill ihpss1 ihpss3 input ipipe iplen iprizr iprop ipump irod itee ivlve ivssl loadn mzirc newdlt out1d out3d outer post post3d preinp prep1d prep3d preper pumpd pumpsr pumpx rcntl rcomp rddim rdrest rerod1 revssl rfdbk rfill rhtstr rpipe rplen rpump rrod2 rsepd rtee rvlve rvssl sedit srtlp tbc1 tf1ds1 value vlvex vssl1
MODULE:	Valve
PURPOSE:	Contains the VALVE-component-specific routines.
Source file:	ValveM.f90
CONTAINs:	dvlve faxpos ivlve revlve rvlve vlve1 vlve2 vlve3 vlvex wvlve
USEs MODULES:	Global ValveArray
USEd by:	dmpit icomp out1d post prep1d rdcomp rdrest sdmpit sgnfetup wcomp
MODULE:	ValveArray
PURPOSE:	Defines the derived-type `valveArrayT` specific to VALVE-component arrays.
Source file:	ValveArrayM.f90
USEs MODULES:	GlobalDim IntrType
USEd by:	Valve
MODULE:	ValveVlt
PURPOSE:	Contains routines specific to the VALVE-component VLT for initial setup and clearing, loading data from and storing data in the global VLT arrays, and reading from and writing to the restart dump file.
Source file:	ValveVltM.f90
CONTAINs:	GetValveTab ValveTableDump ValveTableRst
USEs MODULES:	Global IntrType
USEd by:	dmpVLT dvlve input ivlve revlve rstVLT rvlve sgnfvlve svset1 vlve1 vlve2 vlve3 vlvex vsgnfvlve wvlve xtvvalv
MODULE:	VectDrag
PURPOSE:	Contains routines required for evaluation of the 3D wall shear coefficients, including declaration of variables and pointers and setting the coefficients in vector mode.
Source file:	VectDragM.f90
CONTAINs:	prefwd tmpptr
USEs MODULES:	IntrType
USEd by:	vssl1

MODULE:	VessArray
PURPOSE:	Declares and allocates memory for VESSEL-component-specific arrays.
Source file:	VessArrayM.f90
CONTAINs:	AllocVess
USEs MODULES:	GlobalDim IntrType
USEd by:	Htif3D StbVel3DJun SysService cif3 civssl dlevel dvssl htstrv ihpss3 ivssl j3d out3d post3d prefwd prep3d revssl rvssl set3dbd svset3 tf3ds3 vssl1 vssl2 vssl3 vssrod wlevel wvssl xtvvsl

MODULE:	VessArray3
PURPOSE:	Declares and allocates memory for VESSEL-component-generic arrays.
Source file:	VessArray3M.f90
CONTAINs:	AllocVess3 GetVSAR
USEs MODULES:	GlobalDim IntrType
USEd by:	PressCoef3D SetJunAvgPtrs StbME3D StbVelx StbVely StbVelz SysService VessTo1D bakup bkstb3 cella3 cif3 dvpscl dvssl ff3d fluxes htstrv ifset ihpss3 initbc ivssl iwall3 j3d mix3d prefwd rdzmom revssl rvssl sclmom set3dbd setbdt sgnf3d sgnfvol3d stbme3 svset3 tf3ds tf3ds1 tf3ds3 timupd velbc vrbd vssl1 vssl2 vssl3 vssrod vssssr wvssl xtvvsl zerov

MODULE:	VessCon
PURPOSE:	Declares and intializes INTEGER parameters for the 3D VESSEL component.
Source file:	VessConM.f90
USEs MODULES:	IntrType
USEd by:	AllocVess PressCoef3D RodHtcref1 StbME3D StbVelx StbVely StbVelz VessTo1D bakup bansol bkstb3 blkdat cella3 cif3 copya core1 dlevel dvpscl dvssl ff3d fluxes hlflmr htif htpipe htstr1 htstr3 htstrp htstrv htvssl hvwebb ifset ihpss3 initbc input irodl ivssl iwall3 j3d leveli levelr mix3d namlst prefwd rdzmom revssl rhtstr rlevel rodht rvssl sclmom set3dbd setbdt setva sgnf3d sgnfvol3d stbme3 svset3 tf3ds tf3ds1 tf3ds3 timupd velbc vrbd vssl1 vssl2 vssl3 vssrod vssssr wlevel wvssl zcore zerov

MODULE:	VessCrunch
PURPOSE:	Contains worker routines applicable to the VESSEL-component arrays, where the access to the array database is through the argument interface.
Source file:	VessCrunchM.f90

CONTAINs:	bakup cella3 chksr copya dvpscl ff3d fluxes gvssl1 gvssl2 ifset initbc iwall3 leveli levelr mix3d rdzmom rlevel sclmom setbdt setva stbme3 timupd vrbd vssssr
USEs MODULES:	Util
USEd by:	VessTask svset3

MODULE:	VessMat
PURPOSE:	Declares and allocates memory for the 3D-VESSEL-component, container-array-pointers vmap (Vessel Matrix Array Pointers).
Source file:	VessMatM.f90
CONTAINs:	allocVmap
USEs MODULES:	IntrType
USEd by:	civssl input out3d post3d prep3d revssl rvssl vssl1 vssl2 vssl3

MODULE:	VessStbME
PURPOSE:	Wrapper for the subroutines directly associated with the 3D stabilizer mass and energy equations.
Source file:	VessStbMEM.f90
CONTAINs:	StbME3D bkstb3
USEs MODULES:	IntrType
USEd by:	vssl3

MODULE:	VessStbVel
PURPOSE:	Wrapper for the subroutines directly associated with the 3D stabilizer velocity equations.
Source file:	VessStbVelM.f90
CONTAINs:	StbVelx StbVely StbVelz
USEs MODULES:	Matrices SysConfig Util
USEd by:	vssl1

MODULE:	VessTF3DS
PURPOSE:	Contains subroutines to linearize the hydrodynamic semi-implicit finite-difference equations for VESSEL components.
Source file:	VessTF3DSM.f90
CONTAINs:	tf3ds tf3ds1 tf3ds3 velbc zerov
USEs MODULES:	Util
USEd by:	vssl2

MODULE:	VessTask
PURPOSE:	Contains task management routines applicable to the VESSEL-component arrays that access the global database.
Source file:	VessTaskM.f90

CONTAINs:	cif3 civssl dlevel dvssl htstrv ihpss3 ivssl j3d out3d post3d prep3d revssl rvssl set3dbd vssl1 vssl2 vssl3 wlevel wvssl
USEs MODULES:	IntrType VessCrunch
USEd by:	dmpit htstr1 icomp input outer post prep rdrest sdmpit sgnfetup wcomp

MODULE:	VessTf3dc
PURPOSE:	Declares variables required to process multiple VESSELs.
Source file:	VessTf3dcM.f90
USEs MODULES:	IntrType
USEd by:	PressCoef3D StbME3D StbVelx StbVely StbVelz bakup bkstb3 cella3 cif3 civssl dvpscl dvssl ff3d gvssl1 htif icomp ifset ihpss3 initbc ivssl iwall3 j3d leveli levelr mix3d out3d post3d prefwd prep3d rdzmom revssl rvssl sclmom set3dbd sgnfvol3d stbme3 tf3ds tf3ds1 tf3ds3 timupd vrbd vssl1 vssl2 vssl3 vssssr wvssl

MODULE:	VessTo1D
PURPOSE:	Contains routines that provide a copy-in, copy-out interface from the 3D VESSEL arrays to the same 1D arrays used by the 1D components.
Source file:	VessTo1DM.f90
CONTAINs:	Evaldf3D Fprop3D Htif3D Therm3D
USEs MODULES:	IntrType VessArray3 VessCon
USEd by:	ivssl tf3ds tf3ds3 vssl2 vssl3

MODULE:	VessVlt
PURPOSE:	Contains routines specific to the VESSEL component VLT for initial setup and clearing, loading data from and storing data in the global VLT arrays, and reading from and writing to the restart dump file.
Source file:	VessVltM.f90
CONTAINs:	GetVessTab VessTableDump VessTableRst
USEs MODULES:	Global IntrType
USEd by:	Adj3DEdge AllocVess Htif3D InitBDArray PressCoef3D SetIVolAdj StbME3D StbVelx StbVely StbVelz bakup bkstb3 cella3 chksr cif3 civssl dmpVLT dvpscl dvssl ff3d fluxes gvssl1 gvssl2 htstrv ifset ihpss3 initbc ivssl iwall3 j3d lchvss leveli levelr mix3d out3d post3d prefwd prep3d rdzmom revssl rstVLT rvssl sclmom set3dbd setbdt sgnf3d sgnfvol3d stbme3 svset3 tf3ds tf3ds1 tf3ds3 timupd velbc vrbd vssl1 vssl2 vssl3 vssssr wvssl xtvvsl zerov

MODULE:	Xtv
PURPOSE:	Contains routines specific to graphics processing with XTV.
Source file:	XtvM.f90

CONTAINs:	PrintVarDesc WriteSim2DArray WriteStSumV1 WriteStaticV1 WriteStaticV3 WriteValAs2DArray WriteValAsArray WriteValAsSArray xtv1d xtvGnPr xtvbi3e xtvbrak xtvbuf1 xtvbuf1o xtvbuf3 xtvbufs xtvcntl xtvdr xtvfill xtvht xtvinit xtvpipe xtvplen xtvprzr xtvpump xtvtee xtvvalv xtvvsl
USEs MODULES:	CFaces CXtvXFaces CompTyp ControlDat EngUnits Global GlobalDat GlobalPnt IntrType Io
USEd by:	init pstepq steady trans
MODULE:	Xvol
PURPOSE:	Declares variables used to determine the sensitivity limits for the `tf1ds` subroutine.
Source file:	XvolM.f90
USEs MODULES:	IntrType
USEd by:	CellFluxes EdgeAvg1D JunTerms astpln constb tf1d tf1ds tf3ds tfpln

B.3. INTERFACEs

INTERFACE:	TRACAllo
PURPOSE:	Interface for subroutines `AllocIntOneD`, `AllocRealOneD`, `AllocRealThreeD`, and `AllocRealTwoD`.
Source file:	AllocM.f90
CONTAINed in:	Alloc
CALLed By:	AddSegment1D AddSegment3D AllBOp AllFOp AllocGen1D AllocPlenum AllocVess AllocVess3 SetSysMat allocBoundary icomp input pntrod repipe replen repump resepd retee revlve rpipe rplen rpump rsepd rtee rvlve
INTERFACE:	(UNNAMED)
PURPOSE:	Interface for routines written in C Language (including `xtv` and C implementations for some of the Fortran 90-bit intrinsic functions).
Source file:	CFacesM.f90
CONTAINed in:	Cfaces
INTERFACE:	(UNNAMED)
PURPOSE:	C interface for routines contained in file `Cxtvxdr.c`.
Source file:	CXtvXFacesM.f90
CONTAINed in:	CXtvXFaces

B.4. PROCEDUREs

PROCEDURE: AllocIntOneD
PURPOSE: Interface for subroutine `AllocIntOneD`.
Source file: AllocM.f90
CONTAINed in: Alloc

PROCEDURE: AllocRealOneD
PURPOSE: Interface for subroutine `AllocRealOneD`.
Source file: AllocM.f90
CONTAINed in: Alloc

PROCEDURE: AllocRealThreeD
PURPOSE: Interface for subroutine `AllocRealThreeD`.
Source file: AllocM.f90
CONTAINed in: Alloc

PROCEDURE: AllocRealTwoD
PURPOSE: Interface for subroutine `AllocRealTwoD`.
Source file: AllocM.f90
CONTAINed in: Alloc

B.5. SUBROUTINEs

SUBROUTINE: AddSegment1D
PURPOSE: Adds a 1D segment to the current component's segment list. This is called by all 1D components.
Source file: SysConfigM.f90
CONTAINed in: SysConfig
USEs MODULES: Alloc
CALLs: TRACAllo
CALLed by: repipe replen reprzr repump resepd retee revlve rpipe rplen rprizr rpump rsepd rtee rvlve

SUBROUTINE: AddSegment3D
PURPOSE: Adds a 3D segment to the current component's segment list.
Source file: SysConfigM.f90
CONTAINed in: SysConfig
USEs MODULES: Alloc
CALLs: TRACAllo
CALLed by: revssl rvssl

SUBROUTINE: AllBOp
PURPOSE: Performs memory allocation and reads specified data from and writes specified data to the restart dump file for the BREAK components.
SOURCE file: BreakM.f90
CONTAINed in: Break
USEs MODULES: Alloc Restart
CALLs: TRACAllo bfinn bfoutn
CALLed by: AllBreakArrays

SUBROUTINE: AllBreakArrays
PURPOSE: Controls the operation of `AllBOp` by specifying the operation to be performed (memory allocation, either read from or write to the restart dump file) and the individual arrays to be processed for BREAK components.
SOURCE file: BreakM.f90
CONTAINed in: Break
CALLs: AllBOp
CALLed by: dbrk rbreak rebrk

SUBROUTINE: AllFOp
PURPOSE: Performs memory allocation and reads specified data from and writes specified data to the restart dump file for the FILL components.
SOURCE file: FillM.f90
CONTAINed in: Fill
USEs MODULES: Alloc Restart
CALLs: TRACAllo bfinn bfoutn
CALLed by: AllFillArrays

SUBROUTINE: AllFillArrays
PURPOSE: Controls the operation of `AllFOp` by specifying the operation to be performed (memory allocation, either read from or write to the restart dump file) and the individual arrays to be processed for FILL components.
SOURCE file: FillM.f90
CONTAINed in: Fill
USEs MODULES: Alloc
CALLs: AllFOp
CALLed by: dfill refill rfill

SUBROUTINE: AllocGen1D
PURPOSE: Performs memory allocation for generic 1D arrays.

SOURCE file:	Gen1DArrayM.f90
CONTAINed in:	Gen1DArray
USEs MODULES:	Alloc CompTyp Flt Global GlobalDat HeatArray IntArray
CALLs:	TRACAllo
CALLed by:	rbreak rebrk refill repipe reprzr repump resepd retee revlve rfill rpipe rprizr rpump rsepd rtee rvlve

SUBROUTINE:	AllocIntOneD
PURPOSE:	Fortran 90 dynamic allocation, initialization, and diagnostics routine to establish memory for 1D integer arrays.
SOURCE file:	AllocM.f90
CONTAINed in:	Alloc

SUBROUTINE:	AllocPlenum
PURPOSE:	Performs memory allocation for arrays specific to the PLENUM component.
SOURCE file:	PlenumM.f90
CONTAINed in:	Plenum
USEs MODULES:	Alloc Gen1DArray PlenVlt
CALLs:	TRACAllo
CALLed by:	replen rplen

SUBROUTINE:	AllocRealOneD
PURPOSE:	Fortran 90 dynamic allocation, initialization, and diagnostics routine to establish memory for 1D real arrays.
SOURCE file:	AllocM.f90
CONTAINed in:	Alloc

SUBROUTINE:	AllocRealThreeD
PURPOSE:	Fortran 90 dynamic allocation, initialization, and diagnostics routine to establish memory for 3D real arrays.
SOURCE file:	AllocM.f90
CONTAINed in:	Alloc

SUBROUTINE:	AllocRealTwoD
PURPOSE:	Fortran 90 dynamic allocation, initialization, and diagnostics routine to establish memory for 2D real arrays.
SOURCE file:	AllocM.f90
CONTAINed in:	Alloc

SUBROUTINE:	AllocVess
PURPOSE:	Allocates memory for the VESSEL-component-specific arrays.
Source file:	VessArrayM.f90

CONTAINed in: VessArray
USEs MODULES: Alloc GlobalDat VessCon VessVlt
CALLs: TRACAllo
CALLed by: revssl rvssl

SUBROUTINE: AllocVess3
PURPOSE: Allocates memory for the VESSEL-component-generic arrays.
Source file: VessArray3M.f90
CONTAINed in: VessArray3
USEs MODULES: Alloc
CALLs: TRACAllo
CALLed by: revssl rvssl

SUBROUTINE: AssignGen1DPtr (post 3.0: name changed to AssignPtr)
PURPOSE: Provides a pointer to the source of a specified variable. The variable name is provided as a character string.
Source file: SysServiceM.f90
CONTAINed in: SysService
USEs MODULES: IntrType
CALLed by: SetBDVar

SUBROUTINE: AssocJunPtrs
PURPOSE: Sets junction pointers.
Source file: JunTermsM.f90
CONTAINed in: JunTerms
CALLed by: SetJunAvgPtrs

SUBROUTINE: BackUpGen1D
PURPOSE: Performs a timestep backup for the generic 1D-component arrays.
SOURCE file: Gen1DArrayM.f90
CONTAINed in: Gen1DArray
USEs MODULES: Global
CALLed by: out1d

SUBROUTINE: BackUpPlen
PURPOSE: Performs a timestep backup for arrays specific to the PLENUM component.
SOURCE file: PlenumM.f90
CONTAINed in: Plenum
USEs MODULES: Gen1DArray Global
CALLed by: out1d

SUBROUTINE:	BlockSolver
PURPOSE:	Reduces the system matrix associated with the semi-implicit equations to a sparse pressure matrix that is solved by subroutine `Solver`.
Source file:	SemiSolverM.f90
CONTAINed in:	SemiSolver
USEs MODULES:	GlobalDat GlobalDim Linear
CALLs:	DpJun JunCoefDp PressCoef1D PressCoef3D PressCoefJun1D PressCoefJun3D Solver sfa44 sfa55 ssl44 ssl55
CALLed by:	outer

SUBROUTINE:	BreakTableDump
PURPOSE:	Writes the VLT of the BREAK component to the dump restart file.
Source file:	BreakVltM.f90
CONTAINed in:	BreakVlt
USEs MODULES:	Restart
CALLs:	bfoutis bfouts
CALLed by:	dmpVLT

SUBROUTINE:	BreakTableRst
PURPOSE:	Reads the VLT of the BREAK component from the dump restart file.
Source file:	BreakVltM.f90
CONTAINed in:	BreakVlt
USEs MODULES:	Restart
CALLs:	bfinis bfins
CALLed by:	rstVLT

SUBROUTINE:	BuildBndryTable
PURPOSE:	Builds the data-transfer table associated with communication of the component boundary.
Source file:	SysServiceM.f90
CONTAINed in:	SysService
USEs MODULES:	GlobalDim IntrType
CALLed by:	SetBDVar

SUBROUTINE:	CSDump
PURPOSE:	Controls writing the control system data to the dump restart file.
SOURCE file:	ControlDatM.f90
CONTAINed in:	ControlDat
USEs MODULES:	Restart
CALLs:	bfoutis bfoutn bfoutni bfouts
CALLed by:	dmpit

SUBROUTINE:	CSFree
PURPOSE:	Deallocates only the control system memory required to read the dump restart file.
SOURCE file:	ControlDatM.f90
CONTAINed in:	ControlDat
CALLed by:	rdrest

SUBROUTINE:	CSRestart
PURPOSE:	Controls reading the control system data from the dump restart file.
SOURCE file:	ControlDatM.f90
CONTAINed in:	ControlDat
USEs MODULES:	Restart
CALLs:	bfinis bfinn bfinni bfins
CALLed by:	rdrest

SUBROUTINE:	CSSetLuIdx
PURPOSE:	Initializes the control block, signal, and trip unit label indexes, alieviating the need for further lookup.
Source file:	ControlDatM.f90
CONTAINed in:	ControlDat
USEs MODULES:	EngUnits Io
CALLs:	LuMatch error
CALLed by:	init

SUBROUTINE:	CellFluxes
PURPOSE:	Sums contributions from all cell-face flows needed in the calculation of the semi-implicit mass and energy equations.
Source file:	Gen1DCrunchM.f90
CONTAINed in:	Gen1DCrunch
USEs MODULES:	Global GlobalDat Matrices SysConfig Xvol
CALLed by:	tf1d

SUBROUTINE:	CellLogic
PURPOSE:	Sets variables giving composite information on velocities at each volume's faces. Some details of equation solution depend on knowing whether all velocities bounding a cell are effectively zero or if one of these velocities has changed sign.
Source file:	Gen1DCrunchM.f90
CONTAINed in:	Gen1DCrunch
USEs MODULES:	Global GlobalDat Matrices SysConfig
CALLed by:	tf1d

SUBROUTINE:	CheckAcc
PURPOSE:	Determines whether the friction factors for each junction cell opposing this component are set according to the accumulator phase separation model. If so, it copies the adjacent component's `jun2` `g1DAr` friction values to the current component's `g1DAr` locations.
Source file:	Gen1DInitM.f90
CONTAINed in:	Gen1DInit
USEs MODULES:	Flt Gen1DArray GlobalDat IntrType SysConfig
CALLed by:	ipipe iprizr ipump ivlve

SUBROUTINE:	CheckOtherSeg
PURPOSE:	Checks the other side of the last junction to see if further special processing is required before normal tracing through mesh segments may continue.
Source file:	SysConfigM.f90
CONTAINed in:	SysConfig
CALLs:	FindMeshEnd
CALLed by:	SetSysVar

SUBROUTINE:	ClearFluxSums
PURPOSE:	Clears variables used to sum the mass and energy fluxes needed in the calculation of the semi-implicit mass and energy equations. Also initializes logical variables describing general characteristics of the equation sets needed in the global solution.
SOURCE file:	MatricesM.f90
CONTAINed in:	Matrices
USEs MODULES:	GlobalDat
CALLed by:	outer

SUBROUTINE:	CopyGen1DArray
PURPOSE:	Copies a generic 1D-component array.
SOURCE file:	Gen1DArrayM.f90
CONTAINed in:	Gen1DArray
CALLs:	Get1DArrayPointer
CALLed by:	svset1

SUBROUTINE:	DpJun
PURPOSE:	After solution of the semi-implicit pressure equations by `Solver`, calculates the difference between pressure changes in the two cells adjacent to each mesh segment junction. Information is extracted directly from the system pressure change solution (pS) and placed in `blocks%cDp(1,icDp)`.
SOURCE file:	JunTermsM.f90

CONTAINed in: JunTerms
CALLed by: BlockSolver

SUBROUTINE: EdgJun1D
PURPOSE: An internal subroutine used by `SetSysMat` to calculate off-band coupling coefficients for cell edge `i`, where `i` is taken from the context of `SetSysMat`. This logic is applied to each of the two volumes adjacent to face `i` and isolated here to avoid repetition of coding within `SetSysMat`. Results are loaded into `aIndE%aob`.
SOURCE file: SetMatM.f90
CONTAINed in: SetMat
CALLed by: SetSysMat

SUBROUTINE: EdgJunCount
PURPOSE: Internal to subroutine `SetSysMat`, this counts the number of faces connecting to the two volumes adjacent to cell edge `i`, which may contribute momentum to face `i`. Results are stored in the array `icountE`.
SOURCE file: SetMatM.f90
CONTAINed in: SetMat
CALLed by: SetSysMat

SUBROUTINE: EdgeAvg1D
PURPOSE: Calculates quantities necessary to evaluate cell-edge fluxes and derivatives of these fluxes in a 1D mesh segment.
SOURCE file: Gen1DCrunchM.f90
CONTAINed in: Gen1DCrunch
USEs MODULES: Bits CFaces Flt Global GlobalDat Matrices SysConfig Xvol
CALLed by: tf1d

SUBROUTINE: EqnSubstitute
PURPOSE: Substitutes the results of solving the band matrix block in terms of network variables (call to `Trisolve`) into a network equation. Results are placed in the module variables `net%a` and `rhsnet`.
Source file: MatricesM.f90
CONTAINed in: Matrices
CALLed by: Solver

SUBROUTINE: Evaldf3D
PURPOSE: Loads 3D VESSEL array data into 1D-component arrays.
Source file: VessTo1DM.f90
CONTAINed in: VessTo1D
USEs MODULES: EvalDF GlobalDim

CALLs: evaldf1d
CALLed by: vssl3

SUBROUTINE: ExtraTrid
PURPOSE: Assigns extra tridiagonal submatrices, where a change in subnetwork occurs without a corresponding splitting row (entry in `splitRowsC` or `splitRowsE`)
Source file: SetMatM.f90
CONTAINed in: SetMat
CALLed by: SetTridiag

SUBROUTINE: FillTableDump
PURPOSE: Writes the VLT of the FILL component to the dump restart file.
Source file: FillVltM.f90
CONTAINed in: FillVlt
USEs MODULES: Restart
CALLs: bfoutis bfouts
CALLed by: dmpVLT

SUBROUTINE: FindMeshEnd
PURPOSE: At this point, the junction indexed `jOther` is at a side branch of a 1D component. We need to trace back to a starting point that will prevent loss of information in further variable indexing for this contiguous 1D mesh. This subroutine traces through 1D mesh segments until it hits a 3D segment, hits a one-ended mesh segment, hits a component with no segments (Break or Fill), or returns to the starting point of the trace (closed loop). The end of this trace is taken as the point for continuing the numbering of systemwide variables.
Source file: SysConfigM.f90
CONTAINed in: SysConfig
CALLs: StartOneEnded
CALLed by: CheckOtherSeg SetSysVar

SUBROUTINE: FillTableRst
PURPOSE: Reads the VLT of the FILL component from the dump restart file.
Source file: FillVltM.f90
CONTAINed in: FillVlt
USEs MODULES: Restart
CALLs: bfinis bfins
CALLed by: rstVLT

SUBROUTINE: Fprop3D
PURPOSE: Controls the evaluation of fluid property data for 3D VESSEL arrays.

Source file: VessTo1DM.f90
CONTAINed in: VessTo1D
USEs MODULES: Eos GlobalDim
CALLs: fprop
CALLed by: ivssl vssl3

SUBROUTINE: GenJunInfo
PURPOSE: Adds information about the component's position index in the order of computation (`ioc`), the index in component information arrays (`ijcmp`), and generation of information for `junCells`, which are not provided in the call to `Junctions`. This includes combining existing information in the `compSeg` array and `junCells` to build needed data on all side junctions into a given mesh segment.
Source file: SysConfigM.f90
CONTAINed in: SysConfig
USEs MODULES: Global GlobalDim
CALLed by: init

SUBROUTINE: GenTableDump
PURPOSE: Generic routine that writes the FLT that is generic to all component types to the restart dump file.
SOURCE file: FltM.f90
CONTAINed in: Flt
USEs MODULES: Restart
CALLs: bfoutis bfoutn bfouts
CALLed by: dbrk dcomp dfill dhtstr dplen dvssl

SUBROUTINE: GenTableRst
PURPOSE: Reads the FLT that is generic to all component types from the restart dump file.
SOURCE file: FltM.f90
CONTAINed in: Flt
USEs MODULES: Restart
CALLs: bfinis bfinn bfins
CALLed by: rdrest

SUBROUTINE: Get1DArrayPointer
PURPOSE: Returns the pointer for a generic 1D-component array.
SOURCE file: Gen1DArrayM.f90
CONTAINed in: Gen1DArray
USEs MODULES: Global
CALLed by: CopyGen1DArray GetGen1D GetGen1DArray IncrementGen1D

SUBROUTINE: Get2DArrayPointer
PURPOSE: Returns the pointer for a generic 1D-component, 2D array.
SOURCE file: Gen1DArrayM.f90
CONTAINed in: Gen1DArray
USEs MODULES: Global
CALLed by: GetGen1D2D

SUBROUTINE: GetGen1DArray
PURPOSE: Returns the pointer for a generic 1D-component array.
SOURCE file: Gen1DArrayM.f90
CONTAINed in: Gen1DArray
CALLs: Get1DArrayPointer
CALLed by: svset1

SUBROUTINE: GetGenTable
PURPOSE: Generic routine that retrieves the length of the component type, type index, or total number of cells from the FLT that is generic to all component types.
SOURCE file: FltM.f90
CONTAINed in: Flt
CALLs: error
CALLed by: ihpss1 ihpss3 irodl lchpip

SUBROUTINE: GetHS1DPtr
PURPOSE: Returns the pointer for a 1D HTSTR-component array.
SOURCE file: HSArrayM.f90
CONTAINed in: HSArray
USEs MODULES: Global
CALLed by: GetHS

SUBROUTINE: GetHS2DPtr
PURPOSE: Returns the pointer for a 2D HTSTR-component array.
SOURCE file: HSArrayM.f90
CONTAINed in: HSArray
USEs MODULES: Global
CALLed by: GetHS2d

SUBROUTINE: GetHS3DPtr
PURPOSE: Returns the pointer for a 3D HTSTR-component array.
SOURCE file: HSArrayM.f90
CONTAINed in: HSArray
USEs MODULES: Global

CALLed by: GetHS3d GetHSSurf

SUBROUTINE: GetHeatArray
PURPOSE: Returns the pointer for a heated-component array.
SOURCE file: HeatArrayM.f90
CONTAINed in: HeatArray
USEs MODULES: Global
CALLed by: svset1

SUBROUTINE: GetIntTeeFace
PURPOSE: Determines coefficients for flow coupling of velocities at the TEE junction to velocities at the other faces of the JCELL for a TEE component. Mimics behavior of subroutine TEEX but is modified for use in the System Services.
SOURCE file: SysServiceM.f90
CONTAINed in: SysService
USEs MODULES: IntrType OneDDat
CALLed by: SetBDJunCell

SUBROUTINE: GetLocalSysInfo
PURPOSE: Gets computer and operating system names.
Source file: CFacesM.f90
CONTAINed in: CFaces
CALLed by: xtvinit

SUBROUTINE: GetPumpTab
PURPOSE: Returns PUMP-component common element.
Source file: PumpVltM.f90
CONTAINed in: PumpVlt
CALLs: error
CALLed by: svset1

SUBROUTINE: GetRodTab
PURPOSE: Returns ROD-component common element.
Source file: RodVltM.f90
CONTAINed in: RodVlt
CALLs: error
CALLed by: core1 svseth

SUBROUTINE: GetTeeTab
PURPOSE: Returns TEE-component common element.
Source file: TeeVltM.f90
CONTAINed in: TeeVlt

CALLs: error
CALLed by: icomp

SUBROUTINE: GetValveTab
PURPOSE: Returns VALVE-component common element.
Source file: ValveVltM.f90
CONTAINed in: ValveVlt
CALLs: error
CALLed by: input svset1

SUBROUTINE: GetVessTab
PURPOSE: Returns VESSEL-component common element.
Source file: VessVltM.f90
CONTAINed in: VessVlt
CALLs: error
CALLed by: lchvss

SUBROUTINE: Htif3D
PURPOSE: Controls the evaluation of the interfacial heat transfer at each cell center for 3D VESSEL arrays.
Source file: VessTo1DM.f90
CONTAINed in: VessTo1D
USEs MODULES: Eos GenHeat GlobalDim VessArray VessVlt
CALLs: htif
CALLed by: vssl2

SUBROUTINE: IncrementGen1D
PURPOSE: Increments the pointer for a generic 1D-component array by an input value.
SOURCE file: Gen1DArrayM.f90
CONTAINed in: Gen1DArray
CALLs: Get1DArrayPointer
CALLed by: piprod

SUBROUTINE: InitBDArray
PURPOSE: Controls the overall initialization of the boundary data array, establishing values of variables needed to locate data to be moved between components. Most of the actual work is passed to subroutine `SetBDJunCell`.
SOURCE file: SysServiceM.f90
CONTAINed in: SysService
USEs MODULES: Boundary CompTyp GlobalDim PlenVlt VessVlt
CALLs: SetBDJunCell

CALLed by: init

SUBROUTINE: InitLabels
PURPOSE: Initializes the units and labels used for SI/English units conversion and output.
SOURCE file: EngUnitsM.f90
CONTAINed in: EngUnits
USEs MODULES: Io
CALLs: LuMatch
CALLed by: input

SUBROUTINE: InitSysTime
PURPOSE: Initializes the system clock.
SOURCE file: SysTimeM.f90
CONTAINed in: SysTime
CALLs: SYSTEM_CLOCK
CALLed by: trac

SUBROUTINE: JCIndex *** Not called, reserved for future use.***
PURPOSE: Returns the index to the `junCells` array information for the given component, cell, and junction number. Also, may optionally return the index to the `junCells` array for the adjacent junction cell.
SOURCE file: SysServiceM.f90
CONTAINed in: SysService
USEs MODULES: IntrType

SUBROUTINE: JunCoefDp
PURPOSE: Evaluates the coefficients of the cell-edge difference in pressure variations for the semi-implicit mass and energy equations at all junctions between mesh segments. This applies information in the derived-type array `junVal` to generate the appropriate coefficients stored in `blocks%cDp`.
Source file: JunTermsM.f90
CONTAINed in: JunTerms
CALLed by: BlockSolver

SUBROUTINE: JunFluxes1D
PURPOSE: Sums contributions from side junctions for mass and energy fluxes needed in the calculation of the semi-implicit mass and energy equations. Convention is that a positive result results in an increase of mass or energy to the cell. Information is obtained from the `junVal` derived-type array and is stored in `blocks%fluxSum`, `blocks%liqVolFluxSum`, and `blocks%vapVolFluxSum`. Special sums are generated related to the new/old weight factor `xvset`

(blocks%fluxltSum, blocks%fluxvtSum, blocks%faWlInVlSum, and blocks%faWvInVvSum). In addition, a logical variable is generated, indicating whether a source of liquid is available to the cell from a side junction (blocks%sourceLiq).

Source file: JunTermsM.f90
CONTAINed in: JunTerms
CALLed by: tf1d

SUBROUTINE: Junctions
PURPOSE: Loads basic information about a cell adjacent to a junction between mesh segments into junCells. Other information contained in junCells is generated by SetSysVar. This is used by all components to register connectivity information.
Source file: SysConfigM.f90
CONTAINed in: SysConfig
CALLed by: rbreak rebrk refill repipe replen reprzr repump resepd retee revlve revssl rfill rpipe rplen rprizr rpump rsepd rtee rvlve rvssl

SUBROUTINE: LuMatch
PURPOSE: Looks up LABEL in the specified list(s) and returns the units-type index and variable index (where possible). Lookup errors are handled by the calling routine. Values not found are indicated by an index of -1.
SOURCE file: EngUnitsM.f90
CONTAINed in: EngUnits
USEs MODULES: BadInput Io
CALLed by: CSSetLuIdx InitLabels uncnvt uncnvtn unnumb xtv1d xtvbrak xtvfill xtvinit xtvplen xtvvsl

SUBROUTINE: PipeTableDump
PURPOSE: Writes the VLT of the PIPE component to the dump restart file.
Source file: PipeVltM.f90
CONTAINed in: PipeVlt
USEs MODULES: Restart
CALLs: bfoutis bfoutn bfouts
CALLed by: dmpVLT

SUBROUTINE: PipeTableRst
PURPOSE: Reads the VLT of the PIPE component from the dump restart file.
Source file: PipeVltM.f90
CONTAINed in: PipeVlt
USEs MODULES: Restart
CALLs: bfinis bfinn bfins

CALLed by: rstVLT

SUBROUTINE: PlenTableDump
PURPOSE: Writes the VLT of the PLENUM component to the dump restart file.
Source file: PlenVltM.f90
CONTAINed in: PlenVlt
USEs MODULES: Restart
CALLs: bfoutis bfouts
CALLed by: dmpVLT

SUBROUTINE: PlenTableRst
PURPOSE: Reads the VLT of the PLENUM component from the dump restart file.
Source file: PlenVltM.f90
CONTAINed in: PlenVlt
USEs MODULES: Restart
CALLs: bfinis bfins
CALLed by: rstVLT

SUBROUTINE: PressCoef1D
PURPOSE: Collects terms in the pressure matrix from information interior to 1D mesh segments. Information is stored in the `blocks%cDp` data structure after block reduction is moved to sparse matrix `a1` for final solution by subroutine `Solver`.
Source file: SemiSolverM.f90
CONTAINed in: SemiSolver
USEs MODULES: GlobalDim SysConfig
CALLed by: BlockSolver

SUBROUTINE: PressCoef3D
PURPOSE: Collects terms in the pressure matrix from information interior to 3D mesh segments. Information stored in the `blocks%cDp` data structure after block reduction is moved to sparse matrix `a3D1` for final solution by subroutine `Solver`.
Source file: SemiSolverM.f90
CONTAINed in: SemiSolver
USEs MODULES: GlobalDat GlobalDim Matrices VessArray3 VessCon VessTf3dc VessVlt
CALLed by: BlockSolver

SUBROUTINE: PressCoefJun1D
PURPOSE: Collects terms in the pressure matrix from information at 1D mesh segment junctions. Coefficients stored in `blocks%cDp` after block

reduction are moved to sparse matrix storage in `a1` for final solution by a call to `Solver`. Adjustments to the right-hand side of equations (stored in `pS`) are made adjacent to pressure boundary conditions.

Source file: JunTermsM.f90
CONTAINed in: JunTerms
CALLed by: BlockSolver

SUBROUTINE: PressCoefJun3D
PURPOSE: Stores pressure matrix coefficients coupling from 3D equations to 1D cells. Coefficients stored in `blocks%cDp` after block reduction are moved to sparse matrix storage in `a3D1` for final solution by a call to `Solver`.
Source file: JunTermsM.f90
CONTAINed in: JunTerms
CALLed by: BlockSolver

SUBROUTINE: PrintVarDesc
PURPOSE: Generates the variable description line for graphics output.
Source file: XtvM.f90
CONTAINed in: Xtv
CALLs: cxtvxvard error
CALLed by: xtv1d xtvGnPr xtvbrak xtvcntl xtvfill xtvht xtvpipe xtvplen xtvprzr xtvpump xtvtee xtvvalv xtvvsl

SUBROUTINE: PrizeTableDump
PURPOSE: Writes theVLT of the PRESSURIZER component to the dump restart file.
Source file: PrizeVltM.f90
CONTAINed in: PrizeVlt
USEs MODULES: GlobalDat Restart
CALLs: bfoutis bfoutn bfouts
CALLed by: dmpVLT

SUBROUTINE: PrizeTableRst
PURPOSE: Reads the VLT of the PRESSURIZER component from the dump restart file.
Source file: PrizeVltM.f90
CONTAINed in: PrizeVlt
USEs MODULES: Restart
CALLs: bfinis bfinn bfins
CALLed by: rstVLT

SUBROUTINE: PumpTableDump

PURPOSE: Writes the VLT of the PUMP component to the dump restart file.
Source file: PumpVltM.f90
CONTAINed in: PumpVlt
USEs MODULES: Restart
CALLs: bfoutis bfoutn bfoutni bfouts
CALLed by: dmpVLT

SUBROUTINE: PumpTableRst
PURPOSE: Reads the VLT of the PUMP component from the dump restart file.
Source file: PumpVltM.f90
CONTAINed in: PumpVlt
USEs MODULES: Restart
CALLs: bfinis bfinn bfinni bfins
CALLed by: rstVLT

SUBROUTINE: RodTableDump
PURPOSE: Writes the VLT of the ROD component to the dump restart file.
Source file: RodVltM.f90
CONTAINed in: RodVlt
USEs MODULES: Restart
CALLs: bfoutis bfoutn bfoutni bfouts
CALLed by: dmpVLT

SUBROUTINE: RodTableRst
PURPOSE: Reads the VLT of the ROD component from the dump restart file.
Source file: RodVltM.f90
CONTAINed in: RodVlt
USEs MODULES: Restart
CALLs: bfinis bfinn bfinni bfins
CALLed by: rstVLT

SUBROUTINE: SAXPYT
PURPOSE: Performs single-precision computation of Y = A * X + Y.
SOURCE file: LinearM.f90
CONTAINed in: Linear

SUBROUTINE: SSCALT
PURPOSE: Performs single-precision vector scale X = A * X.
SOURCE file: LinearM.f90
CONTAINed in: Linear

SUBROUTINE: SearchI

PURPOSE: Searches a list of integers that is already sorted in ascending order for the value contained in argument `ival`. If found, the logical argument `found` is set to true and the position in the array `list` is returned in the argument `location`. If not found, the argument `found` is set to false and the index of the first array element greater than `ival` is returned in `location`.
SOURCE file: SetMatM.f90
CONTAINed in: SetMat
CALLed by: SetSysMat

SUBROUTINE: SepdTableDump
PURPOSE: Adds edit of SEPD (Separator) VLT to dump file.
SOURCE file: SepdVltM.f90
CONTAINed in: SepdVlt
USEs MODULES: Restart
CALLs: bfoutis bfouts
CALLed by: dmpVLT

SUBROUTINE: SepdTableRst
PURPOSE: Reads edit of SEPD (Separator) VLT from dump file.
SOURCE file: SepdVltM.f90
CONTAINed in: SepdVlt
USEs MODULES: Restart
CALLs: bfinis bfins
CALLed by: rstVLT

SUBROUTINE: Set3DSysVar
PURPOSE: Sets system variable indices within the data structure for 3D segments.
Source file: SysConfigM.f90
CONTAINed in: SysConfig
CALLed by: SetSysVar

SUBROUTINE: SetAdjEdgInd
PURPOSE: A system variable index for a cell edge at which an equation is evaluated (`iv`); the index of a variable known to be adjacent on a continuous 1D mesh (`ivadj`) determines if this represents an off-band connection (offband set to .TRUE. if it is) and determines the coefficient within `aIndE%aob` or `aIndE%a` as appropriate for storing matrix elements of cell-edge equations.
Source file: SetMatM.f90
CONTAINed in: SetMat
CALLed by: SetSysMat

SUBROUTINE:	SetBDJunCell
PURPOSE:	Controls the initialization of the boundary data array for a junction cell. It is given the input component number, junction identification number, and number of the cell adjacent to that junction (`compNum`, `junNum`, and `cellNum`). It is also provided with the location to which information is to be stored on conditions beyond that junction (`bdArray` and `jindex`). It drives a series of calls to `SetBDVar` to establish transfer table entries to move information from the adjacent component into the boundary information storage.
Source file:	SysServiceM.f90
CONTAINed in:	SysService
USEs MODULES:	IntrType PlenArray PlenVlt TeeVlt
CALLs:	GetIntTeeFace SetBDVar
CALLed by:	InitBDArray

SUBROUTINE:	SetBDVar
PURPOSE:	Drives the generation of transfer table entries. It is given the name of the array data to be transferred, the offset of the data beyond the current junction, and a location to which the information will be transferred. Using this and component and junction information stored in the module data structure, it obtains values for the TO, FROM, and flipSign components of the table.
Source file:	SysServiceM.f90
CONTAINed in:	SysService
CALLs:	AssignGen1DPtr BuildBndryTable TableTransfer
CALLed by:	SetBDJunCell

SUBROUTINE:	SetCenPointers
PURPOSE:	Sets network matrix solution pointers specific to cell-centered variables.
Source file:	MatricesM.f90
CONTAINed in:	Matrices
CALLed by:	SetNetPointers

SUBROUTINE:	SetEdgPointers
PURPOSE:	Sets network matrix solution pointers specific to cell-edge variables.
Source file:	MatricesM.f90
CONTAINed in:	Matrices
CALLed by:	SetNetPointers

SUBROUTINE:	SetIVolAdj
PURPOSE:	For each edge in the system, finds and stores the system volume indices on the plus (`iVol%p`) and minus (`iVol%m`) sides of that edge.

Source file: SetMatM.f90
CONTAINed in: SetMat
USEs MODULES: VessVlt
CALLed by: SetSysMat

SUBROUTINE: SetJunAvgPtrs
PURPOSE: Sets the pointers contained in the `junVal` derived-type array to average quantities at 1D-mesh-segment exterior junctions (including end junctions). These pointers will be used in generating system matrix coefficients involving coupling across these segment junctions.
Source file: JunTermsM.f90
CONTAINed in: JunTerms
USEs MODULES: Gen1DArray VessArray3
CALLs: AssocJunPtrs
CALLed by: init

SUBROUTINE: SetNetPointers
PURPOSE: Links generic pointers used in `Solver` to data objects specific to the variable `varname`. Use of this subroutine significantly simplifies the argument list required by subroutine `Solver`.
SOURCE file: MatricesM.f90
CONTAINed in: Matrices
CALLs: SetCenPointers SetEdgPointers
CALLed by: Solver

SUBROUTINE: SetRodTab
PURPOSE: Overwrites specified variable in HTSTR VLT.
SOURCE file: RodVltM.f90
CONTAINed in: RodVlt
CALLs: error
CALLed by: core1

SUBROUTINE: SetSegment
PURPOSE: Allocates the seg1D or seg3D components in the current element of the `compSeg` derived-type array and stores the total number of segments. This must be called by all component input subroutines.
SOURCE file: SysConfigM.f90
CONTAINed in: SysConfig
CALLed by: rbreak rebrk refill repipe replen reprzr repump resepd retee revlve revssl rfill rpipe rplen rprizr rpump rsepd rtee rvlve rvssl

SUBROUTINE: SetSysMat

PURPOSE: Initial setup of system matrices, including allocation of space for all arrays required for solving the systemwide equations. Also sets key indices, such as `aIndc`, `aIndE`, `i3DC`, `i3DE`, `netIndC`, `netIndE`, and `adjEdg`.

SOURCE file: SetMatM.f90

CONTAINed in: SetMat

USEs MODULES: Alloc Global GlobalDat GlobalDim

CALLs: EdgJun1D EdgJunCount SearchI SetAdjEdgInd SetIVolAdj SetTridiag TRACAllo

CALLed by: init

SUBROUTINE: SetSysVar

PURPOSE: Sets the unique system-variable indices for every volume and edge in the system. Ordering of variables attempts to preserve the longest pure tridiagonal submatrices possible. Ordering also is done in a way that keeps all variables associated with any physically connected 1D region grouped together (this constitutes a subnetwork). All variables from 1D regions precede those from 3D regions.

SOURCE file: SysConfigM.f90

CONTAINed in: SysConfig

USEs MODULES: Global

CALLs: CheckOtherSeg FindMeshEnd Set3DSysVar StartOneEnded

CALLed by: init

SUBROUTINE: SetTridiag

PURPOSE: Sets variables defining pure tridiagonal submatrices in the system, including related values in the network indices array.

SOURCE file: SetMatM.f90

CONTAINed in: SetMat

CALLs: ExtraTrid

CALLed by: SetSysMat

SUBROUTINE: Solver

PURPOSE: Solves sparse linear equations with coefficients stored in an array of types `sparseMatrixT` and `vssMatrixT`. The matrix structure contains banded submatrices and is solved with a network solution procedure (based on original TRAC solution procedures) that collapses banded structures, thus reducing the problem to the solution of one or more network matrices involving equations with off-band coefficients. This assumes that the right-hand side of all linear equations has been loaded into the system variable arrays (`araS`, `arlS`, etc.) and returns the answers in these arrays. This implementation assumes that the band structure is tridiagonal with

its call to `trisolver`, but the remaining structure will handle a general band matrix.

SOURCE file: MatricesM.f90
CONTAINed in: Matrices
USEs MODULES: GlobalDim Linear
CALLs: EqnSubstitute SetNetPointers Trisolve matsol sgefat sgeslt
CALLed by: BlockSolver post prep

SUBROUTINE: StartBranch
PURPOSE: Searches for a side branch from currently traced segments that has itself not been traced and returns the index of the junction cell information leading to that branch.
SOURCE file: SysConfigM.f90
CONTAINed in: SysConfig

SUBROUTINE: StartOneEnded
PURPOSE: Used by `SetSysVar` when it starts tracing a 1D region within a component with only one end connection. This completes all necessary assignments for that component, leaving `SetSysVar` ready to deal with the component connected to this one.
SOURCE file: SysConfigM.f90
CONTAINed in: SysConfig
CALLed by: FindMeshEnd SetSysVar

SUBROUTINE: StbME3D
PURPOSE: Sets up 3D stabilizer equations for mass and energy. Stores velocity matrix elements.
SOURCE file: VessStbMEM.f90
CONTAINed in: VessStbME
USEs MODULES: Bits Boundary CFaces GlobalDat GlobalDim Matrices VessArray3 VessCon VessTf3dc VessVlt
CALLed by: vssl3

SUBROUTINE: StbME3DJun
PURPOSE: Evaluates contributions to the 3D stabilizer mass and energy equations from mass and energy fluxes at junctions to 1D mesh segments. Results are placed directly into the 3D system matrices (`a3Dl` and `a3Dv`) and storage for right-hand sides of the equations (`arlS`, `arvS`, `arelS`, `arevS`, `araS`, and `arcS`).
SOURCE file: JunTermsM.f90
CONTAINed in: JunTerms
CALLed by: post

SUBROUTINE: StbMEJun

PURPOSE:	Evaluates contributions to the 1D stabilizer mass and energy equations from mass and energy fluxes at junctions between mesh segments. Results are placed directly into the system matrices (`al` and `av`) and storage for right-hand sides of the equations (`arlS`, `arvS`, `arelS`, `arevS`, `araS`, and `arcS`).
SOURCE file:	JunTermsM.f90
CONTAINed in:	JunTerms
CALLed by:	post
SUBROUTINE:	StbVel1D
PURPOSE:	Sets up 1D?Set up for 1D stabilizing momentum equations, that are? modified for separated equation solution.
SOURCE file:	Gen1DCrunchM.f90
CONTAINed in:	Gen1DCrunch
INCLUDEs files:	cflow ciflim constant diddle ifcrs strtnt tst3d vdvmod vellim webnum
USEs MODULES:	Bad Bits CFaces Ccfl CompTyp Flt GlobalDat Io Matrices OneDDat SysConfig Util
CALLs:	error level
CALLed by:	preper
SUBROUTINE:	StbVel3DJun
PURPOSE:	Stores coefficients coupling 3D equations stabilizer momentum to 1D stabilizer velocities. Results are placed directly into the 3D system matrices (`a3DlE` and `a3DvE`). This deals only with 3D coupling coefficients. Contributions from 1D momentum sources to the right-hand side of 3D equations currently are evaluated directly within `StbVelx`, `StbVely`, and `StbVelz`.
SOURCE file:	JunTermsM.f90
CONTAINed in:	JunTerms
USEs MODULES:	VessArray
CALLed by:	prep
SUBROUTINE:	StbVelx
PURPOSE:	Sets up the stablizer equations of motion for the radial or x direction in a VESSEL component; stores network-solution results for same into a VESSEL database.
SOURCE file:	VessStbVelM.f90
CONTAINed in:	VessStbVel
INCLUDEs files:	diddle tst3d
USEs MODULES:	CFaces Eos GlobalDat GlobalDim VessArray3 VessCon VessTf3dc VessVlt
CALLed by:	vssl1

SUBROUTINE:	StbVely
PURPOSE:	Sets up the stablizer equations of motion for the azimuthal or y direction in a VESSEL component; stores network-solution results for same into a VESSEL database.
SOURCE file:	VessStbVelM.f90
CONTAINed in:	VessStbVel
INCLUDEs files:	diddle tst3d
USEs MODULES:	CFaces Eos GlobalDat GlobalDim VessArray3 VessCon VessTf3dc VessVlt
CALLed by:	vssl1

SUBROUTINE:	StbVelz
PURPOSE:	Sets up the stablizer equations of motion for the axial or z direction in a VESSEL component; stores network-solution results for same into a VESSEL database.
SOURCE file:	VessStbVelM.f90
CONTAINed in:	VessStbVel
INCLUDEs files:	constant tst3d vdvmod
USEs MODULES:	CFaces Ccfl Eos GlobalDat GlobalDim VessArray3 VessCon VessTf3dc VessVlt
CALLed by:	vssl1

SUBROUTINE:	TableTransAll
PURPOSE:	System service to transfer data for all entries in the data transfer table.
SOURCE file:	SysServiceM.f90
CONTAINed in:	SysService
CALLed by:	hout icomp init post steady trans

SUBROUTINE:	TableTransComp
PURPOSE:	System service to drive the transfer of data for entries in the data transfer table associated with the current component. The index `cco` is used to locate information on the current component. This subroutine is being used as a temporary table driver while conflicts in information flow are resolved that prevent the use of `TableTransAll`. Actual transfer is performed by `TableTransJC`.
SOURCE file:	SysServiceM.f90
CONTAINed in:	SysService
USEs MODULES:	Boundary IntrType
CALLs:	TableTransJC
CALLed by:	break1 break2 fill1 fill2 ibrk ifill inner ipipe iplen iprizr ipump itee ivlve ivssl pipe1 plen1 plen2 post3d prizr1 pump1 tee1 vlve1 vssl1 vssl2

SUBROUTINE: TableTransJC
PURPOSE: System service to transfer the data for entries in the data transfer table associated with a specific junction cell.
SOURCE file: SysServiceM.f90
CONTAINed in: SysService
USEs MODULES: IntrType
CALLed by: TableTransComp

SUBROUTINE: TableTransfer
PURPOSE: System service to transfer a single entry in the data transfer table to where?.
SOURCE file: SysServiceM.f90
CONTAINed in: SysService
USEs MODULES: IntrType
CALLed by: SetBDVar

SUBROUTINE: TeeTableDump
PURPOSE: Adds edit of TEE VLT to dump file.
SOURCE file: TeeVltM.f90
CONTAINed in: TeeVlt
USEs MODULES: Restart
CALLs: bfoutis bfouts
CALLed by: dmpVLT

SUBROUTINE: TeeTableRst
PURPOSE: Reads edit of TEE VLT from dump file.
SOURCE file: TeeVltM.f90
CONTAINed in: TeeVlt
USEs MODULES: Restart
CALLs: bfinis bfins
CALLed by: rstVLT

SUBROUTINE: Therm3D
PURPOSE: Interface to subroutine `thermo` for VESSEL.
SOURCE file: VessTo1DM.f90
CONTAINed in: VessTo1D
USEs MODULES: Eos GlobalDim
CALLs: thermo
CALLed by: ivssl tf3ds tf3ds3 vssl2 vssl3

SUBROUTINE: TimeUpGen1D
PURPOSE: Old-time/new-time array transfers for 1D components.

SOURCE file: Gen1DArrayM.f90
CONTAINed in: Gen1DArray
USEs MODULES: Global
CALLed by: break1 break3 fillx ibrk ifill ipipe iprizr ipump itee ivlve poster savbd

SUBROUTINE: TimeUpHS
PURPOSE: Old-time/new-time array transfers for HTSTRs.
SOURCE file: HSArrayM.f90
CONTAINed in: HSArray
USEs MODULES: Global
CALLed by: core1 htstr3

SUBROUTINE: TimeUpHS1
PURPOSE: Old-time/new-time array transfers for HTSTRs.
SOURCE file: HSArrayM.f90
CONTAINed in: HSArray
USEs MODULES: Global
CALLed by: htstr1 htstr3

SUBROUTINE: TimeUpPlen
PURPOSE: Old-time/new-time array transfers for PLENUM.
SOURCE file: PlenumM.f90
CONTAINed in: Plenum
USEs MODULES: Gen1DArray Global
CALLed by: iplen plen1 plen3

SUBROUTINE: Trisolve
PURPOSE: Solves a tridiagonal system with coefficients stored in "a", right-hand side stored in "b", and `a%clow` and `a%chigh` used to obtain the final answers as functions of the junction values. The reduction and back-substitution algorithm was extracted from an old version of TRAC-M to match the behavior of the tridiagonal solution in the old FEMOM and STBME.
SOURCE file: MatricesM.f90
CONTAINed in: Matrices
CALLed by: Solver

SUBROUTINE: ValveTableDump
PURPOSE: Adds edit of VALVE VLT to dump file.
SOURCE file: ValveVltM.f90
CONTAINed in: ValveVlt
USEs MODULES: Restart
CALLs: bfoutis bfoutn bfouts

CALLed by: dmpVLT

SUBROUTINE: ValveTableRst
PURPOSE: Reads edit of VALVE VLT from dump file.
SOURCE file: ValveVltM.f90
CONTAINed in: ValveVlt
USEs MODULES: Restart
CALLs: bfinis bfinn bfins
CALLed by: rstVLT

SUBROUTINE: VessTableDump
PURPOSE: Adds edit of VESSEL VLT to dump file.
SOURCE file: VessVltM.f90
CONTAINed in: VessVlt
USEs MODULES: Restart
CALLs: bfoutis bfouts
CALLed by: dmpVLT

SUBROUTINE: VessTableRst
PURPOSE: Reads edit of VESSEL VLT from dump file.
SOURCE file: VessVltM.f90
CONTAINed in: VessVlt
USEs MODULES: Restart
CALLs: bfinis bfins
CALLed by: rstVLT

SUBROUTINE: WriteSim2DArray
PURPOSE: Provides XTV output routine.
SOURCE file: XtvM.f90
CONTAINed in: Xtv
USEs MODULES: EngUnits
CALLs: cxtvxsa2d
CALLed by: xtv1d

SUBROUTINE: WriteStSumV1
PURPOSE: Provides XTV output routine.
SOURCE file: XtvM.f90
CONTAINed in: Xtv
USEs MODULES: EngUnits
CALLs: cxtvxsu1d
CALLed by: xtv1d

SUBROUTINE: WriteStaticV1
PURPOSE: Provides XTV output routine.
SOURCE file: XtvM.f90
CONTAINed in: Xtv
USEs MODULES: EngUnits
CALLs: cxtvxst1d
CALLed by: xtv1d xtvbrak xtvfill xtvplen

SUBROUTINE: WriteStaticV3
PURPOSE: Provides XTV output routine.
SOURCE file: XtvM.f90
CONTAINed in: Xtv
USEs MODULES: EngUnits
CALLs: cxtvxarrupd cxtvxdata cxtvxdatainit
CALLed by: xtvvsl

SUBROUTINE: WriteValAs2DArray ***Not CALLed in Version 3.0.***
PURPOSE: Provides XTV output routine.
SOURCE file: XtvM.f90
CONTAINed in: Xtv
USEs MODULES: EngUnits

SUBROUTINE: WriteValAsArray
PURPOSE: Provides XTV output routine.
SOURCE file: XtvM.f90
CONTAINed in: Xtv
USEs MODULES: EngUnits
CALLs: cxtvxsv1d
CALLed by: xtv1d

SUBROUTINE: WriteValAsSArray
PURPOSE: Provides XTV output routine.
SOURCE file: XtvM.f90
CONTAINed in: Xtv
USEs MODULES: EngUnits
CALLs: cxtvxss1d
CALLed by: xtv1d

SUBROUTINE: allocBoundary
PURPOSE: Allocates storage for the BD and VSI arrays.
SOURCE file: BoundaryM.f90
CONTAINed in: Boundary

USEs MODULES: Alloc Bad
CALLs: TRACAllo
CALLed by: input

SUBROUTINE: allocNet
PURPOSE: Sets network pointers and allocates storage for the RNET array.
SOURCE file: NetworkM.f90
CONTAINed in: Network
CALLed by: icomp

SUBROUTINE: allocPrptb
PURPOSE: Allocates storage for the PRPTB array.
SOURCE file: RodGlobalM.f90
CONTAINed in: RodGlobal
CALLed by: input

SUBROUTINE: allocVmap
PURPOSE: Sets VESSEL matrix array pointers and allocates storage for the VMAP array.
SOURCE file: VessMatM.f90
CONTAINed in: VessMat
CALLed by: input

SUBROUTINE: allocWp
PURPOSE: Allocates storage for the WP array.
SOURCE file: RodGlobalM.f90
CONTAINed in: RodGlobal
CALLed by: input

SUBROUTINE: asign
PURPOSE: Assigns the component pointers according to the internal-order (IORDER) array.
SOURCE file: TracInputM.f90
CONTAINed in: TracInput
CALLed by: input

SUBROUTINE: astpln ***Not called in Version 3.0***
PURPOSE: Evaluates mass and energy fluxes at the PLENUM junctions during postpass.
SOURCE file: PlenumM.f90
CONTAINed in: Plenum
USEs MODULES: Boundary Gen1DArray PlenVlt Xvol

SUBROUTINE: auxpln
PURPOSE: Evaluates mass and energy fluxes at the PLENUM junctions during the outer iteration.
SOURCE file: PlenumM.f90
CONTAINed in: Plenum
USEs MODULES: Boundary CFaces PlenVlt SysService
CALLed by: plen2

SUBROUTINE: bakup
PURPOSE: Overwrites end-of-timestep variables with start-of-timestep values for one VESSEL level.
SOURCE file: VessCrunchM.f90
CONTAINed in: VessCrunch
USEs MODULES: VessArray3 VessCon VessTf3dc VessVlt
CALLed by: vssl2 vssl3

SUBROUTINE: balanct
PURPOSE: Supports subroutine for sgeev that balances a real matrix and isolates eigenvalues whenever possible.
SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLed by: sgeev

SUBROUTINE: balbakt
PURPOSE: Support subroutine for sgeev that forms the eigenvectors of a real matrix.
SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLed by: sgeev

SUBROUTINE: bansol
PURPOSE: Solves linear matrix equation.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
INCLUDEs files: cnrslv
USEs MODULES: Io VessCon
CALLed by: rodht

SUBROUTINE: bdplen
PURPOSE: Fills the PLENUM boundary array.
SOURCE file: PlenumM.f90
CONTAINed in: Plenum
USEs MODULES: Boundary Flt Gen1DArray PlenVlt

SUBROUTINE: bfaloc
PURPOSE: Allocates files and buffers for buffered I/O.
SOURCE file: bfaloc.f90
USEs MODULES: IntrType
CALLed by: dmpit rdrest

SUBROUTINE: bfclos
PURPOSE: Empties buffers and closes file.
SOURCE file: RestartM.f90
CONTAINed in: Restart
USEs MODULES: Global
CALLed by: enddmp

SUBROUTINE: bfin
PURPOSE: Initiates binary input subroutine for calls with real array arguments.
SOURCE file: RestartM.f90
CONTAINed in: Restart
USEs MODULES: Global
CALLs: error
CALLed by: bfinis bfinni bfins rdrest

SUBROUTINE: bfinis
PURPOSE: Initiates binary input subroutine for calls with integer scalar arguments.
SOURCE file: RestartM.f90
CONTAINed in: Restart
CALLs: bfin
CALLed by: BreakTableRst CSRestart FillTableRst GenTableRst PipeTableRst PlenTableRst PrizeTableRst PumpTableRst RodTableRst SepdTableRst TeeTableRst ValveTableRst VessTableRst rdrest

SUBROUTINE: bfinn
PURPOSE: Initiates binary input subroutine for calls with pointer arguments.
SOURCE file: RestartM.f90
CONTAINed in: Restart
USEs MODULES: Global
CALLs: error
CALLed by: AllBOp AllFOp CSRestart GenTableRst PipeTableRst PrizeTableRst PumpTableRst RodTableRst ValveTableRst rebrk recomp refill repipe replen repump rerod1 resepd retee revlve revssl

SUBROUTINE: bfinni

PURPOSE:	Initiates binary input subroutine for calls with integer array arguments.
SOURCE file:	RestartM.f90
CONTAINed in:	Restart
CALLs:	bfin
CALLed by:	CSRestart PumpTableRst RodTableRst revssl

SUBROUTINE:	bfins
PURPOSE:	Initiates binary input subroutine for calls with real scalar arguments.
SOURCE file:	RestartM.f90
CONTAINed in:	Restart
CALLs:	bfin
CALLed by:	BreakTableRst CSRestart FillTableRst GenTableRst PipeTableRst PlenTableRst PrizeTableRst PumpTableRst RodTableRst SepdTableRst TeeTableRst ValveTableRst VessTableRst rdrest rehtst rerod1 revssl

SUBROUTINE:	bfout
PURPOSE:	Initiates binary output subroutine for calls with real array arguments.
SOURCE file:	RestartM.f90
CONTAINed in:	Restart
USEs MODULES:	Global
CALLs:	error
CALLed by:	bfoutis bfoutni bfouts dlevel dmpit

SUBROUTINE:	bfoutis
PURPOSE:	Initiates binary output subroutine for calls with integer scalar arguments.
SOURCE file:	RestartM.f90
CONTAINed in:	Restart
CALLs:	bfout
CALLed by:	BreakTableDump CSDump FillTableDump GenTableDump PipeTableDump PlenTableDump PrizeTableDump PumpTableDump RodTableDump SepdTableDump TeeTableDump ValveTableDump VessTableDump

SUBROUTINE:	bfoutn
PURPOSE:	Initiates binary output subroutine for calls with pointer arguments.
SOURCE file:	RestartM.f90
CONTAINed in:	Restart
USEs MODULES:	Global
CALLs:	error

CALLed by: AllBOp AllFOp CSDump GenTableDump PipeTableDump PrizeTableDump PumpTableDump RodTableDump ValveTableDump dbrk dcomp dfill dpipe dplen dpump drod1 dtee dvlve dvssl

SUBROUTINE: bfoutni
PURPOSE: Initiates binary output subroutine for calls with integer array arguments.
SOURCE file: RestartM.f90
CONTAINed in: Restart
CALLs: bfout
CALLed by: CSDump PumpTableDump RodTableDump dvssl

SUBROUTINE: bfouts
PURPOSE: Initiates binary output subroutine for calls with real scalar arguments.
SOURCE file: RestartM.f90
CONTAINed in: Restart
CALLs: bfout
CALLed by: BreakTableDump CSDump FillTableDump GenTableDump PipeTableDump PlenTableDump PrizeTableDump PumpTableDump RodTableDump SepdTableDump TeeTableDump ValveTableDump VessTableDump dbrk dcomp dfill dhtstr dmpit dplen drod1 dvssl

SUBROUTINE: bkmom
PURPOSE: Driver for `bksmom`; updates certain `bd` information (see comments in coding).
SOURCE file: Gen1DTaskM.f90
CONTAINed in: Gen1DTask
USEs MODULES: Bad Gen1DArray Gen1DCrunch Global GlobalDat GlobalPnt Network OneDDat
CALLs: bksmom
CALLed by: pipe1 prizr1 pump1 tee1 vlve1

SUBROUTINE: bksmom
PURPOSE: Stores solution of 1D stabilizer momentum equations into 1D-component databases.
SOURCE file: Gen1DCrunchM.f90
CONTAINed in: Gen1DCrunch
USEs MODULES: Global GlobalDat Matrices OneDDat SysConfig
CALLed by: bkmom

SUBROUTINE: bkspln

PURPOSE:	Copies system solution for stabilizing mass and energy equations into PLENUM-component database; generates an estimate of new-time void fraction consistent with the results of the stablizer mass and energy equations.
SOURCE file:	PlenumM.f90
CONTAINed in:	Plenum
USEs MODULES:	Eos FailDat Flt Gen1DArray Linear Matrices OneDDat PlenVlt SysConfig Util
CALLs:	sfa55 ssl55
CALLed by:	plen3

SUBROUTINE:	bksstb
PURPOSE:	Copies the system solution for stablizer mass and energy equations into the 1D component databases; generates an estimate of new-time void fraction consistent with the results of the stablizer mass and energy equations.
SOURCE file:	Gen1DCrunchM.f90
CONTAINed in:	Gen1DCrunch
INCLUDEs files:	syssum
USEs MODULES:	Eos FailDat Flt GlobalDat GlobalDim Linear Matrices OneDDat SysConfig Util
CALLs:	sfa55 ssl55
CALLed by:	poster

SUBROUTINE:	bkstb3
PURPOSE:	Copies the system solution for stablizer mass and energy equations into the VESSEL-component databases; generates an estimate of new-time void fraction consistent with the results of the stablizer mass and energy equations.
SOURCE file:	VessStbMEM.f90
CONTAINed in:	VessStbME
INCLUDEs files:	chgalp dtinfo syssum
USEs MODULES:	Bits CFaces Eos FailDat Flt GlobalDat Linear Matrices SysConfig Util VessArray3 VessCon VessTf3dc VessVlt
CALLs:	sfa55 ssl55
CALLed by:	vssl3

SUBROUTINE:	break1
PURPOSE:	Controls BREAK prepass.
SOURCE file:	BreakM.f90
CONTAINed in:	Break
USEs MODULES:	Bits Boundary BreakVlt CFaces ControlDat Eos Flt Gen1DArray Gen1DTask GlobalDat GlobalDim GlobalPnt IntrType OneDDat SysService Util

CALLs:	TableTransComp TimeUpGen1D breakx shiftb
CALLed by:	prep1d

SUBROUTINE:	break2
PURPOSE:	Controls BREAK `outer` iteration.
SOURCE file:	BreakM.f90
CONTAINed in:	Break
USEs MODULES:	Boundary BreakVlt Flt Gen1DArray Gen1DTask GlobalDat IntrType OneDDat SysService
CALLs:	TableTransComp
CALLed by:	out1d

SUBROUTINE:	break3
PURPOSE:	Controls BREAK postpass.
SOURCE file:	BreakM.f90
CONTAINed in:	Break
USEs MODULES:	Boundary BreakVlt Eos Flt Gen1DArray Gen1DTask GlobalDat GlobalDim IntrType OneDDat SysService
CALLs:	TimeUpGen1D fprop thermo
CALLed by:	post

SUBROUTINE:	breakx
PURPOSE:	Evaluates BREAK pressure, temperature, and void fraction.
SOURCE file:	BreakM.f90
CONTAINed in:	Break
INCLUDEs files:	constant
USEs MODULES:	BreakVlt Control Eos Flt Gen1DArray GlobalDat IntrType Io Util
CALLs:	error evltab fprop linint0 mixprp shiftb thermo trip
CALLed by:	break1

SUBROUTINE:	cbedit
PURPOSE:	Edits the first 10 control-block parameter values, along with their variable-name labels and a control-block schematic diagram.
SOURCE file:	ControlM.f90
CONTAINed in:	Control
CALLed by:	rcntl recntl

SUBROUTINE:	cbset
PURPOSE:	Evaluates control-block-function output parameters.
SOURCE file:	ControlM.f90
CONTAINed in:	Control
USEs MODULES:	Util

CALLs: conblk delay error linint0 lint4d
CALLed by: trips

SUBROUTINE: cella3
PURPOSE: Evaluates cell-averaged quantities that are required for the interphasic heat-transfer calculation for the VESSEL component.
SOURCE file: VessCrunchM.f90
CONTAINed in: VessCrunch
INCLUDEs files: diddle strtnt webnum
USEs MODULES: VessArray3 VessCon VessTf3dc VessVlt
CALLed by: vssl2

SUBROUTINE: cellav
PURPOSE: Evaluates cell-averaged quantities that are required for the interphasic heat-transfer calculation for 1D components.
SOURCE file: Gen1DTaskM.f90
CONTAINed in: Gen1DTask
INCLUDEs files: diddle
CALLed by: tf1d

SUBROUTINE: chbd
PURPOSE: Checks boundary data.
SOURCE file: Gen1DInitM.f90
CONTAINed in: Gen1DInit
CALLs: error
CALLed by: chkbd

SUBROUTINE: checksize
PURPOSE: Checks the size of statically allocated arrays.
SOURCE file: checksize.f90
USEs MODULES: IntrType
CALLs: error
CALLed by: icomp ihpss3 input rbreak rdrest rebrk refill repipe replen reprzr repump resepd retee revlve rfill rpipe rplen rprizr rpump rsepd rtee rvlve

SUBROUTINE: chen
PURPOSE: Uses Chen correlation to evaluate the forced-convection, nucleate-boiling, heat-transfer coefficient.
SOURCE file: HeatCorM.f90
CONTAINed in: HeatCor
INCLUDEs files: constant supres
USEs MODULES: Eos Flt GlobalDat Io

CALLed by: htcor htvssl

SUBROUTINE: chf
PURPOSE: Evaluates critical heat flux (CHF) based on a local-conditions formulation.
SOURCE file: HeatCorM.f90
CONTAINed in: HeatCor
USEs MODULES: Eos Io
CALLs: chf1 error
CALLed by: htcor htvssl

SUBROUTINE: chf1
PURPOSE: Applies Biasi CHF correlation.
SOURCE file: HeatCorM.f90
CONTAINed in: HeatCor
INCLUDEs files: chfint constant diddlh
CALLed by: chf htcor htvssl

SUBROUTINE: chkbd
PURPOSE: Checks for the consistency in the boundary-array data during initialization.
SOURCE file: Gen1DInitM.f90
CONTAINed in: Gen1DInit
INCLUDEs files: elvkf
USEs MODULES: Bad Bits CFaces CompTyp Flt Gen1DArray Global GlobalDat IntArray SysConfig
CALLs: chbd
CALLed by: ipipe iprizr ipump itee ivlve

SUBROUTINE: chksr
PURPOSE: Checks VESSEL-component SOURCE locations.
SOURCE file: VessCrunchM.f90
CONTAINed in: VessCrunch
USEs MODULES: Io VessVlt
CALLs: error
CALLed by: rvssl

SUBROUTINE: choke
PURPOSE: Evaluates the critical-flow phasic velocities and their derivatives with respect to the donor-cell total pressure.
SOURCE file: Gen1DCrunchM.f90
CONTAINed in: Gen1DCrunch
INCLUDEs files: cflow constant

USEs MODULES: Eos Linear
CALLs: error sgedit sgeev sgefat sgeslt sound therms
CALLed by: tf1ds1

SUBROUTINE: cif3
PURPOSE: Evaluates interfacial shear for VESSEL component.
SOURCE file: VessTaskM.f90
CONTAINed in: VessTask
INCLUDEs files: ciflim constant diddle diddlh film ifcrs refhti2 tst3d webnum
USEs MODULES: Bits CFaces GlobalDat VessArray VessArray3 VessCon VessTf3dc VessVlt
CALLed by: vssl1

SUBROUTINE: cihtst
PURPOSE: Sets up arrays for HTSTR component.
SOURCE file: RodTaskM.f90
CONTAINed in: RodTask
USEs MODULES: Flt Global GlobalPnt Io RodVlt
CALLs: error irod irodl
CALLed by: icomp

SUBROUTINE: civssl
PURPOSE: Transfers vessel data from LCM to SCM define? so that the remaining data can be initialized.
SOURCE file: VessTaskM.f90
CONTAINed in: VessTask
INCLUDEs files: elvkf
USEs MODULES: Boundary CompTyp Flt Global GlobalDim GlobalPnt SysService VessArray VessMat VessTf3dc VessVlt
CALLs: error ihpss3 ivssl
CALLed by: icomp

SUBROUTINE: clean
PURPOSE: Closes TRAC output files.
SOURCE file: clean.f90
USEs MODULES: CXtvXFaces IntrType Io Restart
CALLs: cxtvxclose enddmp
CALLed by: error steady trac

SUBROUTINE: clear
PURPOSE: Sets a real undimensioned array to a constant value.
SOURCE file: UtilM.f90

CONTAINed in: Util
CALLed by: hout ihpss3 input out3d

SUBROUTINE: cleardf1dc
PURPOSE: Replaces a vector clear call with common marker variables in old code.
SOURCE file: OneDDatM.f90
CONTAINed in: OneDDat
CALLed by: out1d prep1d

SUBROUTINE: cleari
PURPOSE: Sets an integer array to a constant value.
SOURCE file: cleari.f90
USEs MODULES: IntrType
CALLed by: input loadn out3d rddim sedit srtlp

SUBROUTINE: clearn
PURPOSE: Sets a real allocated array to a constant value.
SOURCE file: UtilM.f90
CONTAINed in: Util
CALLed by: ipump ivssl loadn preper rcomp revssl rplen rrod2 rvssl

SUBROUTINE: compi
PURPOSE: Performs various A-array loading tasks common to most 1D components.
SOURCE file: Gen1DInitM.f90
CONTAINed in: Gen1DInit
INCLUDEs files: constant
USEs MODULES: CompTyp Flt Gen1DArray Global GlobalDat HeatArray
CALLed by: ipipe iprizr ipump itee ivlve

SUBROUTINE: conblk
PURPOSE: Computes all 61 types of control-block outputs that do not require tabular storage or PI/PID controllers.
SOURCE file: ControlM.f90
CONTAINed in: Control
CALLs: error
CALLed by: cbset

SUBROUTINE: constb
PURPOSE: Drives subroutine STBME.
SOURCE file: Gen1DTaskM.f90
CONTAINed in: Gen1DTask

USEs MODULES: Bad CompTyp Flt Gen1DArray Gen1DCrunch Global GlobalDat GlobalPnt Network OneDDat SysService Xvol

CALLs: stbme

CALLed by: pipe3 prizr3 pump3 tee3 vlve3

SUBROUTINE: copya

PURPOSE: Copies value of variable SRCVAL into variable SNKVAL.

SOURCE file: VessCrunchM.f90

CONTAINed in: VessCrunch

USEs MODULES: VessCon

CALLed by: mix3d

SUBROUTINE: core1

PURPOSE: Evaluates ROD heat-transfer coefficients and tracks quench fronts.

SOURCE file: RodTaskM.f90

CONTAINed in: RodTask

INCLUDEs files: condht constant diddlh elvkf film htcref2 htcref3 ifcrs refhti refhti2 stncom

USEs MODULES: CompTyp Control EngUnits Eos Flt Global GlobalDat GlobalPnt Io RodGlobal RodHtcref1 RodVlt Thermocple Util VessCon

CALLs: GetRodTab SetRodTab TimeUpHS error evfxxx expand fnmesh htcor htvssl mfrod rfdbk rkin shrink trip uncnvts zcore zpwhci zpwnrm zpwrci

CALLed by: htstr1

SUBROUTINE: core3

PURPOSE: Evaluates ROD temperature distributions.

SOURCE file: RodTaskM.f90

CONTAINed in: RodTask

USEs MODULES: ControlDat EvalDF Flt GlobalDat GlobalPnt RodVlt Thermocple

CALLs: error evaldf2d frod

CALLed by: htstr3

SUBROUTINE: cxtvbw

PURPOSE: C language routine that writes binary data to the XTV datafile.

SOURCE file: CFacesM.f90

CONTAINed in: CFaces

SUBROUTINE: cxtvbw1

PURPOSE: C language routine that writes binary data to the XTV datafile.

SOURCE file: CFacesM.f90

CONTAINed in: CFaces

CALLed by: xtvbi3e

SUBROUTINE: cxtvcl
PURPOSE: C language routine that closes the XTV datafile.
SOURCE file: CFacesM.f90
CONTAINed in: CFaces
CALLed by: xtvdr

SUBROUTINE: cxtvin
PURPOSE: C language routine that sets the maximum XTV datafile size from optional file XTVTIN.
SOURCE file: CFacesM.f90
CONTAINed in: CFaces
CALLed by: xtvinit

SUBROUTINE: cxtvoa ***Not used by Version 3.0.***
PURPOSE: C language routine that opens the XTV datafile for appending if less than the maximum size.
SOURCE file: CFacesM.f90
CONTAINed in: CFaces

SUBROUTINE: cxtvoa1
PURPOSE: C language routine that opens the XTV datafile for appending if less than the maximum size.
SOURCE file: CFacesM.f90
CONTAINed in: CFaces
CALLed by: xtvdr

SUBROUTINE: cxtvow ***Not used by Version 3.0.***
PURPOSE: C language routine that creates a new XTV datafile.
SOURCE file: CFacesM.f90
CONTAINed in: CFaces

SUBROUTINE: cxtvxarrupd
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: WriteStaticV3 xtvdr

SUBROUTINE: cxtvxbrak
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvbrak

SUBROUTINE: cxtvxclose
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: clean

SUBROUTINE: cxtvxcntl
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvcntl

SUBROUTINE: cxtvxdata
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: WriteStaticV3 xtvbi3e

SUBROUTINE: cxtvxdatainit
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: WriteStaticV3 xtvdr

SUBROUTINE: cxtvxfill
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvfill

SUBROUTINE: cxtvxgd1a
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtv1d

SUBROUTINE: cxtvxgd1b
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtv1d

SUBROUTINE: cxtvxgd1c
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtv1d

SUBROUTINE: cxtvxgd1d
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces

SUBROUTINE: cxtvxgnpr
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvGnPr

SUBROUTINE: cxtvxhtr1
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvht

SUBROUTINE: cxtvxhtr2
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces

SUBROUTINE: cxtvxhtr3
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvht

SUBROUTINE: cxtvxhtr4
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvht

SUBROUTINE: cxtvxhtr5

PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvht

SUBROUTINE: cxtvxhtr6
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvht

SUBROUTINE: cxtvxhts1
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvht

SUBROUTINE: cxtvxhts2
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvht

SUBROUTINE: cxtvxopn
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvinit

SUBROUTINE: cxtvxpln1
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvplen

SUBROUTINE: cxtvxpln2
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvplen

SUBROUTINE: cxtvxpln3

PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvplen

SUBROUTINE: cxtvxsa2d
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: WriteSim2DArray

SUBROUTINE: cxtvxss1d
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: WriteValAsSArray

SUBROUTINE: cxtvxst1d
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: WriteStaticV1

SUBROUTINE: cxtvxstart
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvinit

SUBROUTINE: cxtvxsu1d
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: WriteStSumV1

SUBROUTINE: cxtvxsv1d
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: WriteValAsArray

SUBROUTINE: cxtvxupdcnts

PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvdr

SUBROUTINE: cxtvxvard
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: PrintVarDesc

SUBROUTINE: cxtvxvcnt
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtv1d xtvGnPr xtvbrak xtvcntl xtvfill xtvht xtvplen xtvvsl

SUBROUTINE: cxtvxvsl1
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvvsl

SUBROUTINE: cxtvxvsl2
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvvsl

SUBROUTINE: cxtvxvsl3
PURPOSE: Interface routine to output XTV data in xdr format.
SOURCE file: CXtvXFacesM.f90
CONTAINed in: CXtvXFaces
CALLed by: xtvvsl

SUBROUTINE: cylht
PURPOSE: Evaluates temperature fields in a cylinder.
SOURCE file: Gen1DCrunchM.f90
CONTAINed in: Gen1DCrunch
INCLUDEs files: constant
CALLed by: poster

SUBROUTINE: daxpy
PURPOSE: Function that evaluates a constant times a vector plus a vector.
SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLed by: dgbfa dgbsl

SUBROUTINE: dbrk
PURPOSE: Generates BREAK data dump.
SOURCE file: BreakM.f90
CONTAINed in: Break
USEs MODULES: BreakVlt Flt Gen1DArray GlobalDim IntrType Restart
CALLs: AllBreakArrays GenTableDump bfoutn bfouts dmpVLT
CALLed by: dmpit

SUBROUTINE: dcodf
PURPOSE: Evaluates a numeric code based on data types.
SOURCE file: TextIoM.f90
CONTAINed in: TextIo
CALLed by: loadn

SUBROUTINE: dcomp
PURPOSE: Dumps 1D component data.
SOURCE file: dcomp.f90
USEs MODULES: CompTyp Flt Gen1DArray Global GlobalDat GlobalDim IntArray IntrType Restart
CALLs: GenTableDump bfoutn bfouts dmpVLT
CALLed by: dpipe dprizr dpump dtee dvlve

SUBROUTINE: decays
PURPOSE: Initializes the decay-heat constants to be consistent with the ANS5.1 1979 standard.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
INCLUDEs files: decayc
CALLed by: rrod2

SUBROUTINE: delay
PURPOSE: Provides a time-delay function for the input variable (XIN). The output (XOUT) is played back with the value that the input had TAU seconds previously. Linear interpolation is used for playback when TIMET minus TAU falls between two stored-time values. The user specifies the number of table storage pairs (NINT) to be saved. Both

the time and the value of the input are stored in the table array as pairs of points.

SOURCE file: ControlM.f90
CONTAINed in: Control
USEs MODULES: Util
CALLs: error linint0
CALLed by: cbset

SUBROUTINE: deltar
PURPOSE: Evaluates transient fuel-cladding gap spacing (only if NFCI = 1).
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
CALLed by: gapht

SUBROUTINE: dfill
PURPOSE: Generates FILL data dump.
SOURCE file: FillM.f90
CONTAINed in: Fill
USEs MODULES: FillVlt Flt Gen1DArray GlobalDim IntrType Restart
CALLs: AllFillArrays GenTableDump bfoutn bfouts dmpVLT
CALLed by: dmpit

SUBROUTINE: dgbfa
PURPOSE: Factors a double-precision band matrix by elimination.
SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLs: daxpy dscal
CALLed by: matsol

SUBROUTINE: dgbsl
PURPOSE: Solves double-precision band system A * X = B or TRANS(A) * X = B using factors computed by subroutine DGBFA.
SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLs: daxpy
CALLed by: matsol

SUBROUTINE: dhtstr
PURPOSE: Determines the size of the data dump and writes the restart input data for an HTSTR component to the dump file.
SOURCE file: RodTaskM.f90
CONTAINed in: RodTask

INCLUDEs files:	decayc
USEs MODULES:	Flt Global GlobalDat GlobalPnt Restart RodVlt
CALLs:	GenTableDump bfouts dmpVLT drod1
CALLed by:	dmpit

SUBROUTINE:	dlevel
PURPOSE:	Generates VESSEL level data dump.
SOURCE file:	VessTaskM.f90
CONTAINed in:	VessTask
USEs MODULES:	Restart VessArray VessCon
CALLs:	bfout leveli
CALLed by:	dvssl

SUBROUTINE:	dmpVLT
PURPOSE:	Driver routine that dumps the component-specific VLT to the restart file.
SOURCE file:	dmpvlt.f90
USEs MODULES:	BreakVlt CompTyp FillVlt Global IntrType PipeVlt PlenVlt PrizeVlt PumpVlt RodVlt SepdVlt TeeVlt ValveVlt VessVlt
CALLs:	BreakTableDump FillTableDump PipeTableDump PlenTableDump PrizeTableDump PumpTableDump RodTableDump SepdTableDump TeeTableDump ValveTableDump VessTableDump error
CALLed by:	dbrk dcomp dfill dhtstr dplen dvssl

SUBROUTINE:	dmpit
PURPOSE:	Main module that generates a dump.
SOURCE file:	dmpit.f90
INCLUDEs files:	chgalp dlimit elvkf massck
USEs MODULES:	Break Ccfl CompTyp Control EngUnits Eos Fill Flt Global GlobalDat GlobalPnt IntrType Io Pipe Plenum Prizer Pump Restart RodTask Sepd SysTime Tee Temp Valve VessTask
CALLs:	CSDump bfaloc bfout bfouts dbrk dfill dhtstr dpipe dplen dprizr dpump dsepd dtee dvlve dvssl error
CALLed by:	error pstepq timchk trac trans

SUBROUTINE:	dpipe
PURPOSE:	Generates PIPE data dump.
SOURCE file:	PipeM.f90
CONTAINed in:	Pipe
USEs MODULES:	IntrType PipeVlt Restart
CALLs:	bfoutn dcomp
CALLed by:	dmpit

SUBROUTINE: dplen
PURPOSE: Generates PLENUM data dump.
SOURCE file: PlenumM.f90
CONTAINed in: Plenum
USEs MODULES: Flt Gen1DArray PlenVlt Restart
CALLs: GenTableDump bfoutn bfouts dmpVLT
CALLed by: dmpit

SUBROUTINE: dprizr
PURPOSE: Generates PRIZR (Pressurizer) data dump.
SOURCE file: PrizerM.f90
CONTAINed in: Prizer
USEs MODULES: Flt Gen1DArray GlobalDat PrizeVlt
CALLs: dcomp
CALLed by: dmpit

SUBROUTINE: dpump
PURPOSE: Generates PUMP data dump.
SOURCE file: PumpM.f90
CONTAINed in: Pump
USEs MODULES: IntrType PumpVlt Restart
CALLs: bfoutn dcomp
CALLed by: dmpit

SUBROUTINE: drod1
PURPOSE: Writes the restart input data arrays for a subset of the HTSTR-component data to the TRCDMP file.
SOURCE file: RodTaskM.f90
CONTAINed in: RodTask
USEs MODULES: Flt Global GlobalDat Restart RodVlt
CALLs: bfoutn bfouts
CALLed by: dhtstr

SUBROUTINE: dscal
PURPOSE: Scales a vector by a constant.
SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLed by: dgbfa

SUBROUTINE: dsepd
PURPOSE: Generates SEPD (Separator) data dump.

SOURCE file: SepdM.f90
CONTAINed in: Sepd
CALLs: dtee
CALLed by: dmpit

SUBROUTINE: dtee
PURPOSE: Generates TEE data dump.
SOURCE file: TeeM.f90
CONTAINed in: Tee
USEs MODULES: Flt IntArray IntrType Restart TeeVlt
CALLs: bfoutn dcomp
CALLed by: dmpit dsepd

SUBROUTINE: dvlve
PURPOSE: Generates VALVE data dump.
SOURCE file: ValveM.f90
CONTAINed in: Valve
USEs MODULES: IntrType Restart ValveVlt
CALLs: bfoutn dcomp
CALLed by: dmpit

SUBROUTINE: dvpscl
PURPOSE: Initializes scale factors on derivative of velocities with respect to pressure for one VESSEL level.
SOURCE file: VessCrunchM.f90
CONTAINed in: VessCrunch
USEs MODULES: VessArray3 VessCon VessTf3dc VessVlt
CALLs: setva
CALLed by: ivssl vssl1

SUBROUTINE: dvssl
PURPOSE: Generates VESSEL data dump.
SOURCE file: VessTaskM.f90
CONTAINed in: VessTask
USEs MODULES: Flt Global GlobalDat GlobalDim Restart VessArray VessArray3 VessCon VessTf3dc VessVlt
CALLs: GenTableDump bfoutn bfoutni bfouts dlevel dmpVLT
CALLed by: dmpit

SUBROUTINE: ecomp
PURPOSE: Writes hydrodynamic and heat-transfer information for 1D components to output file.

SOURCE file: ecomp.f90
USEs MODULES: Bits CFaces EngUnits Flt Gen1DArray Global GlobalDat HeatArray IntArray IntrType Io
CALLs: uncnvt uncnvts
CALLed by: wbreak wfill wpipe wprizr wpump wsepd wtee wvlve

SUBROUTINE: edit
PURPOSE: Entry routine for edit module.
SOURCE file: edit.f90
USEs MODULES: ControlDat EngUnits Global GlobalDat GlobalPnt IntrType Io
CALLs: sedit uncnvt wcomp
CALLed by: error hout pstepq steady timchk trans

SUBROUTINE: elgr
PURPOSE: Converts cell elevations to the slope between cells and converts K factors to additive friction-loss coefficients.
SOURCE file: Gen1DInitM.f90
CONTAINed in: Gen1DInit
INCLUDEs files: elvkf
USEs MODULES: Bad CompTyp EngUnits Flt GlobalDat Io TextIo
CALLs: error uncnvts warray
CALLed by: ipipe iprizr ipump itee ivlve

SUBROUTINE: enddmp
PURPOSE: Empties dump buffers and closes dump file.
SOURCE file: RestartM.f90
CONTAINed in: Restart
CALLs: bfclos error
CALLed by: clean

SUBROUTINE: error
PURPOSE: Processes different kinds of error conditions.
SOURCE file: error.f90
USEs MODULES: CompTyp EngUnits Flt GlobalDat IntrType Io SysTime
CALLs: clean dmpit edit
CALLed by: CSSetLuIdx GetGenTable GetPumpTab GetRodTab GetTeeTab GetValveTab GetVessTab PrintVarDesc SetRodTab StbVel1D bfin bfinn bfout bfoutn breakx cbset chbd checksize chf chksr choke cihtst civssl conblk core1 core3 delay dmpVLT dmpit elgr enddmp evaldf1d evaldf2d evfxxx evltab fbrcss fillx getcrv hash hout htstr3 htstrp hvwebb icomp ihpss1 ihpss3 init input irod irodl itee ivlve jfind junsol loadn ltopp matsol mfrod mstrct namlst nxtcmp offtke out1d out3d outer post post3d preinp prep1d prep3d pumpd

pumpsr rbreak rcntl rcomp rdcomp rddim rdrest readi readr recntl rfdbk rfill rhtstr rkin rlevel rodht rpipe rplen rpump rrod1 rrod2 rsepd rstVLT rtee rttr rvlve rvssl sclmom sepd1 settype sgeev sgefst sound srtlp steady svset svset1 svset3 svseth teemet teemf1 teemom tf3ds thermd thermh timchk timstp trans trip trips trpset uncnvt uncnvtn uncnvts unnumb unsvcb vssl1 wir xtvinit zpwrci

SUBROUTINE: etee
PURPOSE: Evaluates TEE parameters on explicit pass.
SOURCE file: TeeM.f90
CONTAINed in: Tee
USEs MODULES: IntrType OneDDat TeeVlt Util
CALLed by: itee tee3

SUBROUTINE: evaldf1d
PURPOSE: Evaluates the absolute difference between XOLD and XNEW for 1D allocated arrays.
SOURCE file: EvalDFM.f90
CONTAINed in: EvalDF
USEs MODULES: Flt
CALLs: error
CALLed by: Evaldf3D pipe3 prizr3 pump3 tee3 vlve3

SUBROUTINE: evaldf2d
PURPOSE: Evaluates the absolute difference between XOLD and XNEW for 2D allocated arrays.
SOURCE file: EvalDFM.f90
CONTAINed in: EvalDF
USEs MODULES: Flt
CALLs: error
CALLed by: core3 pipe3 pump3 tee3 vlve3

SUBROUTINE: evfxxx
PURPOSE: Evaluates the XXX component-action function using allocated arrays.
SOURCE file: ControlM.f90
CONTAINed in: Control
USEs MODULES: Util
CALLs: error evltab linint0 trip
CALLed by: core1 pipe1 pipe3 pump3 rkin tee1x tee3 vlve3

SUBROUTINE: evltab

PURPOSE:	Interpolates the function value F from the tabular data based on the value of the table's independent variable function using allocated arrays: a signal variable (NVAR.GT.0), a control block (NVAR. LT.0), or a trip-signal difference DELSV (NVAR.EQ.0).
SOURCE file:	ControlM.f90
CONTAINed in:	Control
USEs MODULES:	Util
CALLs:	error linint0
CALLed by:	breakx evfxxx fillx pumpsr vlvex

SUBROUTINE:	expand
PURPOSE:	Adds rows of conduction nodes within the VESSEL rods during reflood.
SOURCE file:	RodCrunchM.f90
CONTAINed in:	RodCrunch
USEs MODULES:	Thermocple
CALLed by:	core1

SUBROUTINE:	faxpos
PURPOSE:	Evaluates the flow-area fraction, FA, or valve-stem fractional position, XPOS, for the VALVE.
SOURCE file:	ValveM.f90
CONTAINed in:	Valve
USEs MODULES:	IntrType
CALLed by:	rvlve vlvex

SUBROUTINE:	fbrcss
PURPOSE:	Identifies BREAK components that are coupled through a fluid-flow path to the secondary side of a steam generator.
SOURCE file:	ControlM.f90
CONTAINed in:	Control
USEs MODULES:	BadInput
CALLs:	error
CALLed by:	input

SUBROUTINE:	ff3d
PURPOSE:	Makes final pass update for all variables in 3D VESSEL.
SOURCE file:	VessCrunchM.f90
CONTAINed in:	VessCrunch
USEs MODULES:	Bits CFaces GlobalDat VessArray3 VessCon VessTf3dc VessVlt
CALLs:	gvssl1
CALLed by:	vssl3

SUBROUTINE:	fill1
PURPOSE:	Controls FILL prepass.
SOURCE file:	FillM.f90
CONTAINed in:	Fill
USEs MODULES:	Bits Boundary CFaces FillVlt Flt Gen1DArray Gen1DTask GlobalDat IntrType SysService
CALLs:	TableTransComp fillx
CALLed by:	prep1d

SUBROUTINE:	fill2
PURPOSE:	Controls FILL `outer` iteration.
SOURCE file:	FillM.f90
CONTAINed in:	Fill
USEs MODULES:	Boundary FillVlt Flt Gen1DTask GlobalDat IntrType SysService
CALLs:	TableTransComp
CALLed by:	out1d

SUBROUTINE:	fill3
PURPOSE:	Controls FILL postpass.
SOURCE file:	FillM.f90
CONTAINed in:	Fill
USEs MODULES:	Boundary FillVlt Flt Gen1DArray Gen1DTask GlobalDat IntrType
CALLed by:	post

SUBROUTINE:	fillx
PURPOSE:	Evaluates postpass FILL velocity.
SOURCE file:	FillM.f90
CONTAINed in:	Fill
INCLUDEs files:	constant
USEs MODULES:	Boundary Control Eos FillVlt Flt Gen1DArray GlobalDat GlobalDim GlobalPnt IntrType Io SysService Util
CALLs:	TimeUpGen1D error evltab fprop linint0 mixprp shiftb thermo trip
CALLed by:	fill1

SUBROUTINE:	fltom
PURPOSE:	Controls transfer of data between `hydro` and HTSTR databases.
SOURCE file:	RodTaskM.f90
CONTAINed in:	RodTask
USEs MODULES:	CompTyp Global Global GlobalDat GlobalPnt RodVlt
CALLs:	piprod vssrod
CALLed by:	htstr1 htstr3

SUBROUTINE: flux
PURPOSE: Evaluates mass flow at the boundary of a 1D component for use in mass inventory.
SOURCE file: Gen1DCrunchM.f90
CONTAINed in: Gen1DCrunch
INCLUDEs files: massck
USEs MODULES: Bad Bits CFaces CompTyp
CALLed by: preper

SUBROUTINE: fluxes
PURPOSE: Defines explicit portion of mass- and energy-flux terms.
SOURCE file: VessCrunchM.f90
CONTAINed in: VessCrunch
USEs MODULES: GlobalDat VessArray3 VessCon VessVlt
CALLed by: vssl2

SUBROUTINE: fnmesh
PURPOSE: Initializes the supplemental user-specified rows of conduction nodes within the VESSEL rods at the start of reflood.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
CALLed by: core1

SUBROUTINE: fprop
PURPOSE: Determines the D2O or H2O fluid enthalpy, transport properties, and surface tension by calling `fpropd` or `fproph`.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline
USEs MODULES: GlobalDim
CALLs: fpropd fproph
CALLed by: Fprop3D break3 breakx fillx ibrk ifill iplen iprop plen3 poster

SUBROUTINE: fpropd
PURPOSE: Evaluates the D2O fluid enthalpy, transport properties, and surface tension using allocated arrays.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline
USEs MODULES: GlobalDim
CALLed by: fprop

SUBROUTINE: fproph
PURPOSE: Evaluates the H2O fluid enthalpy, transport properties, and surface tension using allocated arrays.

SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline
USEs MODULES: GlobalDim
CALLed by: fprop

SUBROUTINE: frod
PURPOSE: Evaluates temperature profiles in nuclear or electrically heated fuel rods.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
USEs MODULES: GlobalDat
CALLs: gapht mwrx rodht
CALLed by: core3

SUBROUTINE: fwall
PURPOSE: Computes a two-phase friction factor.
SOURCE file: Gen1DCrunchM.f90
CONTAINed in: Gen1DCrunch
INCLUDEs files: constant
USEs MODULES: Bad CompTyp Flt OneDDat
CALLs: fwkf
CALLed by: preper

SUBROUTINE: fwkf
PURPOSE: Evaluates form-loss K factors for an abrupt contraction or expansion.
SOURCE file: fwkf.f90
USEs MODULES: IntrType OneDDat
CALLed by: fwall iwall3

SUBROUTINE: gapht
PURPOSE: Evaluates fuel-cladding gap heat-transfer coefficient.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
CALLs: deltar mgap
CALLed by: frod

SUBROUTINE: getcrv
PURPOSE: Gets appropriate pump curves from database.
SOURCE file: PumpSourceM.f90
CONTAINed in: PumpSource
USEs MODULES: IntrType
CALLs: error split

CALLed by: pumpd

SUBROUTINE: gvssl1
PURPOSE: Evaluates integrated VESSEL parameters for graphics purposes.
SOURCE file: VessCrunchM.f90
CONTAINed in: VessCrunch
INCLUDEs files: syssum
USEs MODULES: VessTf3dc VessVlt
CALLed by: ff3d

SUBROUTINE: gvssl2
PURPOSE: Evaluates average values for VESSEL graphics (integrated values calculated in subroutine `gvssl1`).
SOURCE file: VessCrunchM.f90
CONTAINed in: VessCrunch
USEs MODULES: Eos GlobalDat VessVlt
CALLed by: vssl3

SUBROUTINE: hash
PURPOSE: Determines the first array index for each alphabet letter that is the first letter of the character-string label names.
SOURCE file: TracInputM.f90
CONTAINed in: TracInput
USEs MODULES: BadInput EngUnits Io
CALLs: error
CALLed by: input

SUBROUTINE: hlfilm
PURPOSE: Evaluates wall-to-liquid, heat-transfer coefficient in transition and film boiling.
SOURCE file: HeatCorM.f90
CONTAINed in: HeatCor
INCLUDEs files: constant diddlh
CALLed by: htcor

SUBROUTINE: hlflmr
PURPOSE: Evaluates wall-to-liqui,d heat-transfer coefficient in reflood transition and film boiling.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
INCLUDEs files: constant diddlh infohl refhti refhti2
USEs MODULES: RodHtcref1 VessCon
CALLed by: htvssl

SUBROUTINE:	hout
PURPOSE:	Controls the outer-iteration logic for a complete timestep.
SOURCE file:	hout.f90
INCLUDEs files:	dlimit syssum
USEs MODULES:	EngUnits FailDat Global GlobalDat GlobalPnt IntrType Io Network SysService SysTime Util
CALLs:	TableTransAll clear edit error outer post uncnvts
CALLed by:	steady trans

SUBROUTINE:	hqr2t
PURPOSE:	Supports subroutine for sgeev that finds the eigenvalues of a real upper-Hessenberg matrix by the QR quality review? method.
SOURCE file:	LinearM.f90
CONTAINed in:	Linear
CALLed by:	sgeev

SUBROUTINE:	hqrt
PURPOSE:	Support subroutine for sgeev that finds the eigenvalues and eigenvectors of a real upper-Hessenberg matrix by the QR method.
SOURCE file:	LinearM.f90
CONTAINed in:	Linear
CALLed by:	sgeev

SUBROUTINE:	htcor
PURPOSE:	Computes heat-transfer coefficients.
SOURCE file:	HeatCorM.f90
CONTAINed in:	HeatCor
INCLUDEs files:	chfint condht constant diddlh htcav htcs supres
USEs MODULES:	CompTyp Eos Flt GlobalDat Io
CALLs:	chen chf chf1 hlfilm hvfilm hvnb tmsfb
CALLed by:	core1 htpipe

SUBROUTINE:	htif
PURPOSE:	Evaluates the interphasic heat-transfer for the 0D and 1D components using allocated arrays.
SOURCE file:	GenHeatM.f90
CONTAINed in:	GenHeat
INCLUDEs files:	constant diddle diddlh film htcref3 ifcrs refhti refhti2 tst3d webnum
USEs MODULES:	Bits CFaces CompTyp Eos Flt GlobalDat GlobalDim OneDDat VessCon VessTf3dc
CALLed by:	Htif3D plen2 tf1d

SUBROUTINE:	htpipe
PURPOSE:	Averages velocities and generates heat-transfer coefficients for 1D components.
SOURCE file:	Gen1DTaskM.f90
CONTAINed in:	Gen1DTask
INCLUDEs files:	condht constant diddlh
USEs MODULES:	Bad Flt Gen1DArray Global GlobalDat GlobalDim HeatCor IntArray OneDDat VessCon
CALLs:	htcor
CALLed by:	preper

SUBROUTINE:	htstr1
PURPOSE:	Controls HTSTR prepass.
SOURCE file:	RodTaskM.f90
CONTAINed in:	RodTask
INCLUDEs files:	htcref3
USEs MODULES:	CompTyp EngUnits Flt Global GlobalDat GlobalPnt Io RodVlt VessCon VessTask
CALLs:	TimeUpHS1 core1 fltom htstrv uncnvts
CALLed by:	prep

SUBROUTINE:	htstr3
PURPOSE:	Controls HTSTR postpass.
SOURCE file:	RodTaskM.f90
CONTAINed in:	RodTask
INCLUDEs files:	cnrslv
USEs MODULES:	Flt Global GlobalDat GlobalPnt RodVlt VessCon
CALLs:	TimeUpHS TimeUpHS1 core3 error fltom htstrp
CALLed by:	post

SUBROUTINE:	htstrp
PURPOSE:	Evaluates the heat-structure instantaneous power and total energy in each ROD or SLAB element of the HTSTR.
SOURCE file:	RodTaskM.f90
CONTAINed in:	RodTask
INCLUDEs files:	constant
USEs MODULES:	CompTyp Flt GlobalDat RodVlt Util VessCon
CALLs:	error
CALLed by:	htstr3

SUBROUTINE:	htstrv
PURPOSE:	Initializes to zero some VESSEL-component, hydro-cell arrays used to store HTSTR information.

SOURCE file: VessTaskM.f90
CONTAINed in: VessTask
USEs MODULES: CompTyp Flt Global GlobalDat GlobalPnt VessArray VessArray3 VessCon VessVlt
CALLs: setva
CALLed by: htstr1

SUBROUTINE: htvssl
PURPOSE: Averages velocities and generates heat-transfer coefficients for the VESSEL (reflood model).
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
INCLUDEs files: chfint condht constant diddlh htcav htcref3 htcs ifcrs infohl refhti refhti2 supres
USEs MODULES: CompTyp Eos Flt GlobalDat Io VessCon
CALLs: chen chf chf1 hlflmr hvnb hvwebb
CALLed by: core1

SUBROUTINE: hvfilm
PURPOSE: Evaluates the vapor heat-transfer coefficient that is the maximum of the Bromley, natural-convection, and Dougall-Rohsenow coefficients.
SOURCE file: HeatCorM.f90
CONTAINed in: HeatCor
INCLUDEs files: constant
CALLed by: htcor

SUBROUTINE: hvnb
PURPOSE: Evaluates vapor heat-transfer coefficient for nucleate boiling.
SOURCE file: HeatCorM.f90
CONTAINed in: HeatCor
INCLUDEs files: constant
CALLed by: htcor htvssl

SUBROUTINE: hvwebb
PURPOSE: Evaluates vapor heat-transfer coefficient for dispersed vapor flow.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
USEs MODULES: Eos Io RodHtcref1 VessCon
CALLs: error
CALLed by: htvssl

SUBROUTINE: ibrk

PURPOSE: Initializes the BREAK data arrays that are not input.
SOURCE file: BreakM.f90
CONTAINed in: Break
INCLUDEs files: constant elvkf
USEs MODULES: Boundary BreakVlt Eos Flt Gen1DArray Gen1DTask GlobalDat IntrType Io SysService Util
CALLs: TableTransComp TimeUpGen1D fprop mixprp thermo
CALLed by: icomp

SUBROUTINE: icomp
PURPOSE: Controls the routines that initialize component data.
SOURCE file: icomp.f90
INCLUDEs files: elvkf junction
USEs MODULES: Alloc Boundary Break CompTyp Fill Flt Gen1DTask Global GlobalDat GlobalPnt HpssDat IntrType Io Network OneDDat Pipe Plenum Prizer Pump RodTask Sepd SysService Tee TeeVlt Valve VessTask VessTf3dc
CALLs: GetTeeTab TRACAllo TableTransAll allocNet checksize cihtst civssl error ibrk ifill ihpss1 ipipe iplen iprizr ipump isepd itee ivlve setnet
CALLed by: init

SUBROUTINE: ifill
PURPOSE: Initializes the FILL data arrays that are not input from cards.
SOURCE file: FillM.f90
CONTAINed in: Fill
INCLUDEs files: constant elvkf
USEs MODULES: Boundary Eos FillVlt Flt Gen1DArray Gen1DTask GlobalDat IntrType SysService Util
CALLs: TableTransComp TimeUpGen1D fprop mixprp thermo
CALLed by: icomp

SUBROUTINE: ifset
PURPOSE: Initializes 3D interfacial shear at start of each VESSEL prepass.
SOURCE file: VessCrunchM.f90
CONTAINed in: VessCrunch
USEs MODULES: VessArray3 VessCon VessTf3dc VessVlt
CALLs: setva
CALLed by: vssl1

SUBROUTINE: ihpss1
PURPOSE: Evaluates HPSS initialization for the 1D hydraulic components.
SOURCE file: Gen1DTaskM.f90
CONTAINed in: Gen1DTask

USEs MODULES: CompTyp EngUnits Eos FillVlt Flt Gen1DArray Global GlobalDat GlobalPnt HpssDat Io Temp Util
CALLs: GetGenTable error therms uncnvts
CALLed by: icomp

SUBROUTINE: ihpss3
PURPOSE: Evaluates HPSS initializaton for the 3D VESSEL component.
SOURCE file: VessTaskM.f90
CONTAINed in: VessTask
USEs MODULES: CompTyp EngUnits Eos Flt Gen1DArray Global GlobalDat GlobalPnt HpssDat Io Linear Temp Util Util VessArray VessArray3 VessCon VessTf3dc VessVlt
CALLs: GetGenTable checksize clear error matsol therms
CALLed by: civssl

SUBROUTINE: init
PURPOSE: Entry routine for subroutine INIT.
SOURCE file: init.f90
USEs MODULES: CFaces ControlDat Global GlobalDat GlobalPnt IntrType Io JunTerms SetMat SysConfig SysService Xtv
CALLs: CSSetLuIdx GenJunInfo InitBDArray SetJunAvgPtrs SetSysMat SetSysVar TableTransAll error icomp xtvdr xtvinit
CALLed by: trac

SUBROUTINE: initbc
PURPOSE: Initializes VESSEL component phantom cells and sets some boundary conditions.
SOURCE file: VessCrunchM.f90
CONTAINed in: VessCrunch
USEs MODULES: CFaces VessArray3 VessCon VessTf3dc VessVlt
CALLs: setva
CALLed by: ivssl

SUBROUTINE: inner
PURPOSE: Performs an inner iteration for a 1D component.
SOURCE file: Gen1DTaskM.f90
CONTAINed in: Gen1DTask
USEs MODULES: Bad CFaces CompTyp Flt Gen1DArray Global GlobalDat OneDDat SysService
CALLs: TableTransComp on1123c tf1d
CALLed by: pipe2 prizr2 pump2 tee2 vlve2

SUBROUTINE: input

PURPOSE:	Entry routine for Module `TracInput`.
SOURCE file:	TracInputM.f90
CONTAINed in:	TracInput
INCLUDEs files:	bignum cflow cnrslv concck constant defval diddlh elvkf h2fdbk htcs junction massck nrcmp rows solcon tst3d
USEs MODULES:	Alloc Bad BadInput Boundary Ccfl CompTyp Control EngUnits Eos FailDat Flt Global GlobalDat GlobalPnt HpssDat Io PreInput ReadEcho RodGlobal SysConfig Temp TextIo Util ValveVlt VessCon VessMat VessTask
CALLs:	DATE_AND_TIME GetValveTab InitLabels TRACAllo allocBoundary allocPrptb allocVmap allocWp asign checksize clear cleari error fbrcss hash isort loadn namlst nxtcmp order preinp r2ii rcntl rdcomp rdrest readi readr reecho rvssl seteos settype srtlp uncnvt uncnvts unnumb vmcell warray wlabi
CALLed by:	trac

SUBROUTINE:	ipipe
PURPOSE:	Initializes the PIPE data arrays that are not input.
SOURCE file:	PipeM.f90
CONTAINed in:	Pipe
INCLUDEs files:	elvkf
USEs MODULES:	Boundary Flt Gen1DArray Gen1DInit Gen1DTask GlobalDat GlobalDim IntArray IntrType PipeVlt SysService Util
CALLs:	CheckAcc TableTransComp TimeUpGen1D chkbd compi elgr iprop junsol volfa
CALLed by:	icomp

SUBROUTINE:	iplen
PURPOSE:	Loads the PLENUM arrays that are needed, but not input, to start a problem.
SOURCE file:	PlenumM.f90
CONTAINed in:	Plenum
INCLUDEs files:	constant elvkf
USEs MODULES:	Bad Boundary CompTyp Eos Flt Gen1DArray OneDDat PlenVlt SysService TeeVlt Util
CALLs:	TableTransComp TimeUpPlen fprop mixprp thermo
CALLed by:	icomp

SUBROUTINE:	iprizr
PURPOSE:	Initializes the PRIZER (Pressurizer) data arrays that are not input.
SOURCE file:	PrizerM.f90
CONTAINed in:	Prizer
INCLUDEs files:	constant elvkf

USEs MODULES:	Boundary Flt Gen1DArray Gen1DInit Gen1DTask Global GlobalDat GlobalDim IntArray PrizeVlt SysService Util
CALLs:	CheckAcc TableTransComp TimeUpGen1D chkbd compi elgr iprop junsol volfa
CALLed by:	icomp

SUBROUTINE:	iprop
PURPOSE:	Calls subroutines THERMO, FPROP, and MIXPRP for most 1D components.
SOURCE file:	Gen1DInitM.f90
CONTAINed in:	Gen1DInit
USEs MODULES:	Eos Flt Gen1DArray GlobalDat GlobalPnt RodGlobal Util
CALLs:	fprop mixprp thermo
CALLed by:	ipipe iprizr ipump itee ivlve

SUBROUTINE:	ipump
PURPOSE:	Initializes the PUMP data arrays that are not input.
SOURCE file:	PumpM.f90
CONTAINed in:	Pump
INCLUDEs files:	elvkf
USEs MODULES:	Boundary Flt Gen1DArray Gen1DInit Gen1DTask GlobalDat GlobalDim IntArray IntrType PumpVlt SysService Util
CALLs:	CheckAcc TableTransComp TimeUpGen1D chkbd clearn compi elgr iprop junsol volfa
CALLed by:	icomp

SUBROUTINE:	irod
PURPOSE:	Initializes rod component parameters that are not user input.
SOURCE file:	RodTaskM.f90
CONTAINed in:	RodTask
INCLUDEs files:	constant
USEs MODULES:	CompTyp EngUnits Flt GlobalDat Io RodVlt Util
CALLs:	error linint0 uncnvts zpwhci zpwrci
CALLed by:	cihtst

SUBROUTINE:	irodl
PURPOSE:	Initializes HTSTR arrays that provide information on the location of hydro data.
SOURCE file:	RodCrunchM.f90
CONTAINed in:	RodCrunch
USEs MODULES:	CompTyp Flt GlobalDat GlobalDim Io RodGlobal RodVlt VessCon
CALLs:	GetGenTable error lchpip lchvss
CALLed by:	cihtst

SUBROUTINE: isepd
PURPOSE: Initializes the SEPD (Separator) data arrays that are not input.
SOURCE file: SepdM.f90
CONTAINed in: Sepd
CALLed by: icomp

SUBROUTINE: isort
PURPOSE: Sorts a list of integers in ascending order.
SOURCE file: TracInputM.f90
CONTAINed in: TracInput
CALLed by: input

SUBROUTINE: itee
PURPOSE: Initializes TEE data arrays that are not input from cards.
SOURCE file: TeeM.f90
CONTAINed in: Tee
INCLUDEs files: constant elvkf
USEs MODULES: Boundary Flt Gen1DArray Gen1DInit Gen1DTask GlobalDat GlobalDim HeatArray IntArray IntrType OneDDat SysService TeeVlt Util
CALLs: TableTransComp TimeUpGen1D chkbd compi elgr error etee iprop j1d junsol volfa
CALLed by: icomp

SUBROUTINE: ivlve
PURPOSE: Initializes the VALVE data arrays that are not input.
SOURCE file: ValveM.f90
CONTAINed in: Valve
INCLUDEs files: elvkf
USEs MODULES: Boundary Flt Gen1DArray Gen1DInit Gen1DTask GlobalDat GlobalDim IntArray IntrType Io SysService Util ValveVlt
CALLs: CheckAcc TableTransComp TimeUpGen1D chkbd compi elgr error iprop junsol volfa
CALLed by: icomp

SUBROUTINE: ivssl
PURPOSE: Initializes the VESSEL data arrays that are not input.
SOURCE file: VessTaskM.f90
CONTAINed in: VessTask
INCLUDEs files: bandw ifcrs

USEs MODULES:	Bad Boundary CFaces EngUnits Eos Flt Global GlobalDat GlobalPnt Io RodGlobal SysService Util VessArray VessArray3 VessCon VessTf3dc VessTo1D VessVlt
CALLs:	Fprop3D TableTransComp Therm3D clearn dvpscl initbc iwall3 mix3d rdzmom sclmom set3dbd setbdt uncnvt wlevel
CALLed by:	civssl

SUBROUTINE:	iwall3
PURPOSE:	Divides input friction factor by hydraulic diameter.
SOURCE file:	VessCrunchM.f90
CONTAINed in:	VessCrunch
INCLUDEs files:	elvkf
USEs MODULES:	Flt GlobalDat VessArray3 VessCon VessTf3dc VessVlt
CALLs:	fwkf setva
CALLed by:	ivssl

SUBROUTINE:	j1d
PURPOSE:	Fills bd array at component junctions.
SOURCE file:	Gen1DTaskM.f90
CONTAINed in:	Gen1DTask
USEs MODULES:	Bad CompTyp Gen1DArray Global
CALLed by:	itee jbd4 setbd

SUBROUTINE:	j3d ***Not Called in Version 3.0***
PURPOSE:	Fills bd array at VESSEL SOURCE-connection junctions.
SOURCE file:	VessTaskM.f90
CONTAINed in:	VessTask
USEs MODULES:	Bad Bits Boundary CFaces GlobalDat VessArray VessArray3 VessCon VessTf3dc VessVlt
CALLs:	of1123c

SUBROUTINE:	jbd4
PURPOSE:	Fills bd array with JCELL parameters for the TEE-component internal junction.
SOURCE file:	TeeM.f90
CONTAINed in:	Tee
USEs MODULES:	Flt Gen1DTask IntrType OneDDat
CALLs:	j1d
CALLed by:	tee1

SUBROUTINE:	junsol
PURPOSE:	Determines junction parameters for connecting and sequencing components.

SOURCE file: Gen1DInitM.f90
CONTAINed in: Gen1DInit
USEs MODULES: CompTyp Flt GlobalDim Io
CALLs: error
CALLed by: ipipe iprizr ipump itee ivlve

SUBROUTINE: justlr
PURPOSE: Left or right justifies the letters of a character string.
SOURCE file: justlr.f90
USEs MODULES: IntrType
CALLed by: rcntl readi readr recntl reecho warray wiarn wmxytb

SUBROUTINE: lchpip
PURPOSE: Defines the pointer to the hydro array data for a 1D component.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
USEs MODULES: Flt GlobalDim Io
CALLs: GetGenTable
CALLed by: irodl

SUBROUTINE: lchvss
PURPOSE: Defines the pointer to the hydro array data for a VESSEL component.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
USEs MODULES: Global Io VessVlt
CALLs: GetVessTab
CALLed by: irodl

SUBROUTINE: level
PURPOSE: Uses a curve fit to obtain the water level in a cylindrical pipe as a function of the void fraction.
SOURCE file: Gen1DCrunchM.f90
CONTAINed in: Gen1DCrunch
CALLed by: StbVel1D offtke

SUBROUTINE: leveli
PURPOSE: Transfers data for axial level IZ from inverted form to stacked form.
SOURCE file: VessCrunchM.f90
CONTAINed in: VessCrunch
USEs MODULES: VessCon VessTf3dc VessVlt
CALLed by: dlevel wlevel

SUBROUTINE: levelr
PURPOSE: Transfers data for axial level IZ from stacked form to inverted form.
SOURCE file: VessCrunchM.f90
CONTAINed in: VessCrunch
USEs MODULES: VessCon VessTf3dc VessVlt
CALLed by: revssl rlevel rvssl

SUBROUTINE: linint
PURPOSE: Performs linear interpolation on array tabular data.
SOURCE file: UtilM.f90
CONTAINed in: Util
INCLUDEs files: constant
CALLed by: pumpd pumpx

SUBROUTINE: linint0
PURPOSE: Performs linear interpolation on array tabular data without a derivative evaluation using allocated arrays.
SOURCE file: UtilM.f90
CONTAINed in: Util
CALLed by: breakx cbset cdthex delay evfxxx evltab fillx irod mzirc rfill rpipe rpump rrod2 rsepd rtee rvlve vssl1

SUBROUTINE: lint4d
PURPOSE: Linearly interpolates a function table with zero to four independent variables.
SOURCE file: UtilM.f90
CONTAINed in: Util
CALLed by: cbset rfdbk

SUBROUTINE: loadn
PURPOSE: Reads in specially formatted input data using allocated arrays.
SOURCE file: TextIoM.f90
CONTAINed in: TextIo
INCLUDEs files: defval
USEs MODULES: BadInput Util
CALLs: cleari clearn dcodf error
CALLed by: input rbreak rcntl rcomp rdcrvs rfill rhtstr rpipe rplen rpump rrod2 rsepd rtee rvlve rvssl

SUBROUTINE: matsol
PURPOSE: Solves the vessel-matrix equation A * X = C using the capacitance method.

SOURCE file: LinearM.f90
CONTAINed in: Linear
USEs MODULES: GlobalDim
CALLs: dgbfa dgbsl error sgefat sgeslt
CALLed by: Solver ihpss3

SUBROUTINE: mbn
PURPOSE: Evaluates values for electrically heated nuclear fuel-rod insulator properties.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
CALLed by: mfrod

SUBROUTINE: mfrod
PURPOSE: Orders fuel-rod property selection and evaluates an average temperature for property evaluation.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
USEs MODULES: Io
CALLs: error mbn mfuel mhtr mstrct mzirc
CALLed by: core1

SUBROUTINE: mfuel
PURPOSE: Evaluates uranium dioxide and uranium–plutonium dioxide properties.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
CALLed by: mfrod

SUBROUTINE: mgap
PURPOSE: Evaluates values for the thermal conductivity of the gap-gas mixture.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
USEs MODULES: Eos
CALLed by: gapht

SUBROUTINE: mhtr
PURPOSE: Evaluates values for electrically heated fuel-rod heater coil properties.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
CALLed by: mfrod

SUBROUTINE: mix3d
PURPOSE: Initializes stabilizer quantities at start of problem and equivalences stabilizer quantities to basic values when two-step method is not being used.
SOURCE file: VessCrunchM.f90
CONTAINed in: VessCrunch
USEs MODULES: VessArray3 VessCon VessTf3dc VessVlt
CALLs: copya
CALLed by: ivssl vssl3

SUBROUTINE: mixprp
PURPOSE: Evaluates mixture properties from those of separate phases.
SOURCE file: UtilM.f90
CONTAINed in: Util
CALLed by: breakx fillx ibrk ifill iplen iprop

SUBROUTINE: mprop
PURPOSE: Orders structure property selection and evaluates an average temperature for property evaluation.
SOURCE file: Gen1DCrunchM.f90
CONTAINed in: Gen1DCrunch
CALLs: mstrct
CALLed by: preper

SUBROUTINE: mstrct
PURPOSE: Evaluates properties for certain types of steel.
SOURCE file: mstrct.f90
USEs MODULES: IntrType Io
CALLs: error
CALLed by: mfrod mprop

SUBROUTINE: mwrx
PURPOSE: Evaluates the Zircaloy steam reaction in the cladding at high temperatures.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
INCLUDEs files: constant
CALLed by: frod

SUBROUTINE: mzirc
PURPOSE: Evaluates properties for Zircaloy-4.
SOURCE file: RodCrunchM.f90

CONTAINed in: RodCrunch
USEs MODULES: Util
CALLs: linint0
CALLed by: mfrod

SUBROUTINE: namlst
PURPOSE: Performs input-data check on all namelist variables.
SOURCE file: TracInputM.f90
CONTAINed in: TracInput
INCLUDEs files: cflow cnrslv defval diddlh elvkf htcs tst3d
USEs MODULES: BadInput EngUnits Eos FailDat GlobalDat GlobalDim Io VessCon
CALLs: error uncnvt
CALLed by: input

SUBROUTINE: newdlt
PURPOSE: Evaluates prospective new-time increment.
SOURCE file: TimeStepM.f90
CONTAINed in: TimeStep
INCLUDEs files: chgalp dlimit dtinfo
USEs MODULES: FailDat GlobalDat Io Util
CALLs: sedit
CALLed by: timstp

SUBROUTINE: nxtcmp
PURPOSE: Finds the beginning of data for the next component.
SOURCE file: TracInputM.f90
CONTAINed in: TracInput
USEs MODULES: Io
CALLs: error
CALLed by: input

SUBROUTINE: of1123c
PURPOSE: Performs C implementation of TRAC-P subroutine BITS entry point `of1123` (bit-flag logic).
SOURCE file: CFacesM.f90
CONTAINed in: CFaces
CALLed by: j3d poster set3dbd

SUBROUTINE: offtke
PURPOSE: Evaluates exit void fraction for TEE-component offtake model.
SOURCE file: TeeM.f90
CONTAINed in: Tee

INCLUDEs files: constant
USEs MODULES: Gen1DCrunch IntrType
CALLs: error level
CALLed by: tee3

SUBROUTINE: on1123c
PURPOSE: Performs C implementation of TRAC-P subroutine BITS entry point on1123 (bit-flag logic).
SOURCE file: CFacesM.f90
CONTAINed in: CFaces
CALLed by: inner

SUBROUTINE: order
PURPOSE: Rearranges the signal-variable, control-block, and trip ID numbers in ascending order based on their absolute value and searches for the DO-loop index values for each control-parameter evaluation pass through the signal variables, control blocks, and trips.
SOURCE file: ControlM.f90
CONTAINed in: Control
CALLed by: input

SUBROUTINE: orthest
PURPOSE: Supports subroutine for sgeev that does an orthogonal similarity transformation of a real matrix. **That transforms an orthogonal similarity?**
SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLed by: sgeev

SUBROUTINE: ortrant
PURPOSE: Support subroutine for sgeev that accumulates the orthogonal similarity transformation used in the reduction of a real matrix.**That transforms an orthogonal similarity?**

SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLed by: sgeev

SUBROUTINE: otrcsni
PURPOSE:
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
CALLed by: trac

SUBROUTINE:	out1d
PURPOSE:	Controls `outer` calculation for 1D components.
SOURCE file:	out1d.f90
INCLUDEs files:	vellim
USEs MODULES:	Boundary Break CFaces CompTyp Fill Flt Gen1DArray Global GlobalDat GlobalPnt IntrType OneDDat Pipe Plenum Prizer Pump Sepd Tee Util Valve
CALLs:	BackUpGen1D BackUpPlen break2 cleardf1dc error fill2 pipe2 plen2 prizr2 pump2 sepd2 tee2 vlve2
CALLed by:	outer

SUBROUTINE:	out3d
PURPOSE:	Controls `outer` calculation for a VESSEL.
SOURCE file:	VessTaskM.f90
CONTAINed in:	VessTask
INCLUDEs files:	bandw
USEs MODULES:	CompTyp Flt Global GlobalDat GlobalPnt Io Linear OneDDat Temp Util VessArray VessMat VessTf3dc VessVlt
CALLs:	clear cleari error vssl2
CALLed by:	outer

SUBROUTINE:	outer
PURPOSE:	Controls `outer` calculation for one timestep.
SOURCE file:	outer.f90
USEs MODULES:	FailDat Global GlobalDat GlobalPnt IntrType Io Linear Network OneDDat SemiSolver SysService Temp Util VessTask
CALLs:	BlockSolver ClearFluxSums error out1d out3d
CALLed by:	hout

SUBROUTINE:	pipe1
PURPOSE:	Controls PIPE prepass.
SOURCE file:	PipeM.f90
CONTAINed in:	Pipe
USEs MODULES:	Boundary Control Flt Gen1DArray Gen1DTask Global GlobalDat HeatArray IntrType OneDDat PipeVlt SysService
CALLs:	TableTransComp bkmom evfxxx pipe1x preper savbd
CALLed by:	prep1d

SUBROUTINE:	pipe1x
PURPOSE:	Evaluates liquid volume discharged (q_{out}), collapsed liquid level (z), and volumetric flow rate (v_{flow}); assumes vertical component with low-numbered cell at top.

SOURCE file: PipeM.f90
CONTAINed in: Pipe
USEs MODULES: IntrType PipeVlt
CALLed by: pipe1

SUBROUTINE: pipe2
PURPOSE: Controls PIPE `outer` iteration.
SOURCE file: PipeM.f90
CONTAINed in: Pipe
USEs MODULES: Boundary Gen1DTask GlobalDat IntrType OneDDat PipeVlt SysService
CALLs: inner
CALLed by: out1d

SUBROUTINE: pipe3
PURPOSE: Controls PIPE postpass.
SOURCE file: PipeM.f90
CONTAINed in: Pipe
USEs MODULES: Boundary Control EvalDF Flt Gen1DArray Gen1DTask GlobalDat IntrType OneDDat PipeVlt SysService
CALLs: constb evaldf1d evaldf2d evfxxx poster savbd
CALLed by: post

SUBROUTINE: piprod
PURPOSE: Moves hydro data for a 1D component to and from the HTSTR database.
SOURCE file: RodTaskM.f90
CONTAINed in: RodTask
USEs MODULES: Gen1DArray Global GlobalDat GlobalDim
CALLs: IncrementGen1D
CALLed by: fltom

SUBROUTINE: plen1
PURPOSE: Performs the prep stage calculation for the PLENUM timestep initialization.
SOURCE file: PlenumM.f90
CONTAINed in: Plenum
USEs MODULES: Bad Boundary Gen1DArray GlobalDat OneDDat PlenVlt SysService
CALLs: TableTransComp TimeUpPlen
CALLed by: prep1d

SUBROUTINE: plen2
PURPOSE: Controls PLENUM `outer` iteration.

SOURCE file:	PlenumM.f90
CONTAINed in:	Plenum
INCLUDEs files:	diddle
USEs MODULES:	Bad Boundary Eos Gen1DArray GlobalDat Network OneDDat PlenVlt SysService
CALLs:	TableTransComp auxpln htif tfplbk tfpln thermo
CALLed by:	out1d

SUBROUTINE:	plen3
PURPOSE:	Controls PLENUM postpass.
SOURCE file:	PlenumM.f90
CONTAINed in:	Plenum
INCLUDEs files:	chgalp dtinfo
USEs MODULES:	Bad Boundary CFaces Eos Flt Gen1DArray GlobalDat Network OneDDat PlenVlt SysService
CALLs:	TimeUpPlen bkspln fprop stbmpl thermo
CALLed by:	post

SUBROUTINE:	pntrod
PURPOSE:	Initializes HTSTR pointers.
SOURCE file:	RodTaskM.f90
CONTAINed in:	RodTask
USEs MODULES:	Alloc Flt Global RodVlt
CALLs:	TRACAllo
CALLed by:	rehtst rhtstr

SUBROUTINE:	post
PURPOSE:	Controls postpass calculation for one timestep.
SOURCE file:	post.f90
INCLUDEs files:	chgalp syssum
USEs MODULES:	Break CompTyp FailDat Fill Flt Global GlobalDat GlobalPnt IntrType Io JunTerms Linear Matrices Network OneDDat Pipe Plenum Prizer Pump RodTask Sepd SysService Tee Temp Util Valve VessTask
CALLs:	Solver StbME3DJun StbMEJun TableTransAll break3 error fill3 htstr3 pipe3 plen3 post3d prizr3 pump3 sepd3 tee3 vlve3
CALLed by:	hout steady trans

SUBROUTINE:	post3d
PURPOSE:	Controls postpass calculation for the VESSEL.
SOURCE file:	VessTaskM.f90
CONTAINed in:	VessTask
INCLUDEs files:	bandw

USEs MODULES: CompTyp Flt Global GlobalDat GlobalPnt Io JunTerms Linear Network OneDDat SysService Temp Util VessArray VessMat VessTf3dc VessVlt
CALLs: TableTransComp error set3dbd vssl3
CALLed by: post

SUBROUTINE: poster
PURPOSE: Performs postpass calculation for 1D components.
SOURCE file: Gen1DTaskM.f90
CONTAINed in: Gen1DTask
INCLUDEs files: chgalp constant dtinfo
USEs MODULES: Bad Bits CFaces CompTyp Eos Flt Gen1DArray Gen1DCrunch Global GlobalDat GlobalPnt HeatArray IntArray Network OneDDat
CALLs: TimeUpGen1D bksstb cylht fprop of1123c powint thermo
CALLed by: pipe3 prizr3 pump3 tee3 vlve3

SUBROUTINE: powint
PURPOSE: Evaluates the integral power (energy) into the PIPE wall.
SOURCE file: Gen1DCrunchM.f90
CONTAINed in: Gen1DCrunch
INCLUDEs files: constant
CALLed by: poster

SUBROUTINE: prefwd
PURPOSE: Prepares for evaluation of the 3D wall shear coefficients.
SOURCE file: VectDragM.f90
CONTAINed in: VectDrag
INCLUDEs files: constant diddle film refhti2
USEs MODULES: GlobalDim VessArray VessArray3 VessCon VessTf3dc VessVlt
CALLs: tmpptr vfwall3
CALLed by: vssl1

SUBROUTINE: preinp
PURPOSE: Converts free-format TRACIN deck to format used by TRAC input subroutine.
SOURCE file: PreInputM.f90
CONTAINed in: PreInput
USEs MODULES: GlobalDim Io Util
CALLs: error value
CALLed by: input

SUBROUTINE: prep
PURPOSE: Controls prepass calculation for one timestep.

SOURCE file: prep.f90
USEs MODULES: Control Global GlobalDat GlobalPnt IntrType JunTerms Matrices OneDDat RodTask SysConfig VessTask
CALLs: Solver StbVel3DJun htstr1 prep1d prep3d trips
CALLed by: steady trans

SUBROUTINE: prep1d
PURPOSE: Controls the prepass calculation for 1D components.
SOURCE file: prep1d.f90
INCLUDEs files: dlimit
USEs MODULES: Break CFaces CompTyp Fill Flt GlobalDat GlobalDim GlobalPnt IntrType Io Linear Network OneDDat Pipe Plenum Prizer Pump Sepd Tee Temp Util Valve
CALLs: break1 cleardf1dc error fill1 pipe1 plen1 prizr1 pump1 tee1 vlve1
CALLed by: prep

SUBROUTINE: prep3d
PURPOSE: Controls prepass calculation for 3D components.
SOURCE file: VessTaskM.f90
CONTAINed in: VessTask
INCLUDEs files: bandw
USEs MODULES: CompTyp Flt Global GlobalDat GlobalPnt Io Linear Network OneDDat SysService Temp Util VessArray VessMat VessTf3dc VessVlt
CALLs: error vssl1
CALLed by: prep

SUBROUTINE: preper
PURPOSE: Performs prepass calculation for 1D components.
SOURCE file: Gen1DTaskM.f90
CONTAINed in: Gen1DTask
USEs MODULES: Bad Bits CFaces CompTyp Eos Flt Gen1DArray Gen1DCrunch Global GlobalDat GlobalPnt HeatArray IntArray Network OneDDat PumpSource RodGlobal Util
CALLs: StbVel1D clearn flux fwall htpipe mprop pumpsr volv
CALLed by: pipe1 prizr1 pump1 tee1 vlve1

SUBROUTINE: printClock
PURPOSE: Calculates and outputs the elapsed system time.
SOURCE file: SysTimeM.f90
CONTAINed in: SysTime

SUBROUTINE: prizr1

PURPOSE: Controls PRIZER (Pressurizer) prepass.
SOURCE file: PrizerM.f90
CONTAINed in: Prizer
USEs MODULES: Boundary Flt Gen1DArray Gen1DTask Global GlobalDat HeatArray OneDDat PrizeVlt SysService
CALLs: TableTransComp bkmom preper przr1x savbd
CALLed by: prep1d

SUBROUTINE: prizr2
PURPOSE: Controls PRIZER (Pressurizer) outer iteration.
SOURCE file: PrizerM.f90
CONTAINed in: Prizer
USEs MODULES: Boundary Gen1DTask GlobalDat OneDDat PrizeVlt SysService
CALLs: inner
CALLed by: out1d

SUBROUTINE: prizr3
PURPOSE: Controls PRIZER (Pressurizer) postpass.
SOURCE file: PrizerM.f90
CONTAINed in: Prizer
INCLUDEs files: syssum
USEs MODULES: Boundary EvalDF Flt Gen1DArray Gen1DTask GlobalDat OneDDat PrizeVlt SysService
CALLs: constb evaldf1d poster savbd
CALLed by: post

SUBROUTINE: przr1x
PURPOSE: Evaluates pressurizer mass change during steady-state calculation.
SOURCE file: PrizerM.f90
CONTAINed in: Prizer
USEs MODULES: Gen1DArray PrizeVlt
CALLed by: prizr1

SUBROUTINE: pstepq
PURPOSE: Controls printing, dumping, and graphing of data at the completion of a timestep.
SOURCE file: pstepq.f90
USEs MODULES: DataSgnf GlobalDat IntrType Io Restart SysTime Xtv
CALLs: dmpit edit sdmpit sedit xtvdr
CALLed by: steady trans

SUBROUTINE: pump1

PURPOSE: Controls PUMP prepass.
SOURCE file: PumpM.f90
CONTAINed in: Pump
USEs MODULES: Boundary Flt Gen1DTask GlobalDat HeatArray IntrType OneDDat PumpVlt SysService
CALLs: TableTransComp bkmom preper savbd
CALLed by: prep1d

SUBROUTINE: pump2
PURPOSE: Controls PUMP `outer` iteration.
SOURCE file: PumpM.f90
CONTAINed in: Pump
INCLUDEs files: vellim
USEs MODULES: Boundary Gen1DTask GlobalDat IntrType OneDDat PumpVlt SysService
CALLs: inner
CALLed by: out1d

SUBROUTINE: pump3
PURPOSE: Controls PUMP postpass.
SOURCE file: PumpM.f90
CONTAINed in: Pump
USEs MODULES: Boundary Control EvalDF Flt Gen1DArray Gen1DTask GlobalDat IntrType OneDDat PumpVlt SysService
CALLs: constb evaldf1d evaldf2d evfxxx poster savbd
CALLed by: post

SUBROUTINE: pumpd
PURPOSE: Evaluates head and torque from PUMP curves.
SOURCE file: PumpSourceM.f90
CONTAINed in: PumpSource
INCLUDEs files: constant
USEs MODULES: Global IntrType Io PumpArray PumpVlt Util
CALLs: error getcrv linint
CALLed by: pumpx

SUBROUTINE: pumpi
PURPOSE: Supplies built-in PUMP characteristics.
SOURCE file: PumpM.f90
CONTAINed in: Pump
USEs MODULES: IntrType
CALLed by: rdcrvs

SUBROUTINE: pumpsr
PURPOSE: Evaluates PUMP momentum and energy source.
SOURCE file: PumpSourceM.f90
CONTAINed in: PumpSource
INCLUDEs files: constant vellim
USEs MODULES: Control Flt Global GlobalDat GlobalDim GlobalPnt IntrType Io OneDDat PumpArray PumpVlt Util
CALLs: error evltab pumpx shiftb trip
CALLed by: preper

SUBROUTINE: pumpx
PURPOSE: Evaluates PUMP head and torque.
SOURCE file: PumpSourceM.f90
CONTAINed in: PumpSource
INCLUDEs files: constant
USEs MODULES: Global IntrType Io PumpArray PumpVlt TextIo Util
CALLs: linint pumpd warray
CALLed by: pumpsr

SUBROUTINE: r2ii
PURPOSE: Converts a real value to an integer value.
SOURCE file: TracInputM.f90
CONTAINed in: TracInput
CALLed by: input

SUBROUTINE: rbreak
PURPOSE: Reads BREAK data from input file and creates a pointer table for these data.
SOURCE file: BreakM.f90
CONTAINed in: Break
INCLUDEs files: elvkf junction
USEs MODULES: BreakVlt CompTyp Eos Flt Gen1DArray Global GlobalDat IntrType Io ReadEcho SysConfig TextIo
CALLs: AllBreakArrays AllocGen1D Junctions SetSegment checksize error loadn readi readr scltbl warray
CALLed by: rdcomp

SUBROUTINE: rcntl
PURPOSE: Reads in signal-variable, trip, and controller input data.
SOURCE file: ControlM.f90
CONTAINed in: Control
USEs MODULES: ReadEcho TextIo Util

CALLs:	cbedit error justlr loadn readi readr uncnvts unnumb unsvcb warray wlabin wmxytb
CALLed by:	input
SUBROUTINE:	rcomp
PURPOSE:	Reads data common to most 1D components from input files and writes these data to output file.
SOURCE file:	rcomp.f90
INCLUDEs files:	cflow concck defval elvkf totals
USEs MODULES:	BadInput Bits CFaces Ccfl ControlDat EngUnits Eos Flt Gen1DArray Global GlobalDat GlobalDim GlobalPnt HpssDat IntArray IntrType Io TextIo Util
CALLs:	clearn error loadn therms uncnvt warray wiarn
CALLed by:	rpipe rprizr rpump rsepd rtee rvlve
SUBROUTINE:	rdcomp
PURPOSE:	Controls reading of component data from input file.
SOURCE file:	rdcomp.f90
USEs MODULES:	BadInput Break CompTyp Fill Flt Global GlobalDat GlobalPnt IntrType Io Pipe Plenum Prizer Pump RodTask Sepd Tee Valve
CALLs:	error rbreak rfill rhtstr rpipe rplen rprizr rpump rsepd rtee rvlve
CALLed by:	input
SUBROUTINE:	rdcrds
PURPOSE:	Reads timestep cards until DTMIN < 0 is encountered.
SOURCE file:	rdcrds.f90
USEs MODULES:	IntrType Io ReadEcho
CALLs:	readr
CALLed by:	steady
SUBROUTINE:	rdcrvs
PURPOSE:	Reads PUMP curves from input file.
SOURCE file:	PumpM.f90
CONTAINed in:	Pump
USEs MODULES:	Bad IntrType TextIo
CALLs:	loadn pumpi warray
CALLed by:	rpump
SUBROUTINE:	rddim
PURPOSE:	Reads number of points on PUMP curves from input file.
SOURCE file:	PumpM.f90
CONTAINed in:	Pump
USEs MODULES:	ReadEcho Util

CALLs: cleari error readi
CALLed by: rpump

SUBROUTINE: rdrest
PURPOSE: Controls reading of component data from a restart dump file.
SOURCE file: rdrest.f90
INCLUDEs files: bignum chgalp dlimit elvkf massck nrcmp
USEs MODULES: BadInput Break Ccfl CompTyp Control EngUnits Eos Fill Flt Global GlobalDat GlobalPnt IntrType Io Pipe Plenum Prizer Pump Restart RodTask Sepd Tee Temp Util Valve VessTask
CALLs: CSFree CSRestart GenTableRst bfaloc bfin bfinis bfins checksize error rebrk recntl refill rehtst repipe replen reprzr repump resepd retee revlve revssl
CALLed by: input

SUBROUTINE: rdzmom
PURPOSE: Defines momentum cell reciprocal lengths and weighting factors.
SOURCE file: VessCrunchM.f90
CONTAINed in: VessCrunch
USEs MODULES: VessArray3 VessCon VessTf3dc VessVlt
CALLs: setva
CALLed by: ivssl

SUBROUTINE: readi
PURPOSE: Reads integer data in I14 format.
SOURCE file: ReadEchoM.f90
CONTAINed in: ReadEcho
USEs MODULES: BadInput Io
CALLs: error justlr
CALLed by: input rbreak rcntl rddim rfill rhtstr rpipe rplen rprizr rpump rrod1 rsepd rtee rvlve rvssl

SUBROUTINE: readr
PURPOSE: Reads real data in E14.6 format.
SOURCE file: ReadEchoM.f90
CONTAINed in: ReadEcho
USEs MODULES: BadInput EngUnits Io
CALLs: error justlr uncnvts wir
CALLed by: input rbreak rcntl rdcrds rfill rhtstr rpipe rprizr rpump rrod1 rsepd rtee rvlve rvssl timstp

SUBROUTINE: rebrk
PURPOSE: Reads BREAK data from a restart dump.

SOURCE file: BreakM.f90
CONTAINed in: Break
INCLUDEs files: junction
USEs MODULES: BreakVlt CompTyp Flt Gen1DArray Global GlobalDat IntrType Io ReadEcho Restart SysConfig TextIo
CALLs: AllBreakArrays AllocGen1D Junctions SetSegment bfinn checksize reecho rstVLT warray
CALLed by: rdrest

SUBROUTINE: recntl
PURPOSE: Reads the signal-variable, trip, and controller data from the restart file.
SOURCE file: ControlM.f90
CONTAINed in: Control
USEs MODULES: BadInput ReadEcho TextIo
CALLs: cbedit error justlr reecho unnumb unsvcb warray wmxytb
CALLed by: rdrest

SUBROUTINE: recomp
PURPOSE: Reads data from a restart dump common to most 1D components.
SOURCE file: recomp.f90
USEs MODULES: Gen1DArray Global GlobalDat IntArray IntrType Restart
CALLs: bfinn
CALLed by: repipe reprzr repump resepd retee revlve

SUBROUTINE: reecho
PURPOSE: Outputs real-valued scalar input data read from the TRCRST file to the TRCOUT file.
SOURCE file: ReadEchoM.f90
CONTAINed in: ReadEcho
USEs MODULES: EngUnits Io
CALLs: justlr uncnvts wir
CALLed by: input rebrk recntl refill rehtst repipe replen reprzr repump resepd retee revlve revssl

SUBROUTINE: refill
PURPOSE: Reads FILL data from a restart dump.
SOURCE file: FillM.f90
CONTAINed in: Fill
INCLUDEs files: junction
USEs MODULES: CompTyp FillVlt Flt Gen1DArray Global GlobalDat IntrType Io ReadEcho Restart SysConfig TextIo

CALLs:	AllFillArrays AllocGen1D Junctions SetSegment bfinn checksize reecho rstVLT warray
CALLed by:	rdrest

SUBROUTINE:	rehtst
PURPOSE:	Reads HTSTR scalar input data from a restart dump.
SOURCE file:	RodTaskM.f90
CONTAINed in:	RodTask
INCLUDEs files:	decayc
USEs MODULES:	CompTyp EngUnits Flt Global GlobalDat GlobalPnt ReadEcho Restart RodVlt
CALLs:	bfins pntrod reecho rerod1 rstVLT unnumb unsvcb
CALLed by:	rdrest

SUBROUTINE:	repipe
PURPOSE:	Reads PIPE data from a restart dump.
SOURCE file:	PipeM.f90
CONTAINed in:	Pipe
INCLUDEs files:	junction
USEs MODULES:	Alloc CompTyp Flt Gen1DArray GlobalDim IntArray IntrType PipeVlt ReadEcho Restart SysConfig TextIo
CALLs:	AddSegment1D AllocGen1D Junctions SetSegment TRACAllo bfinn checksize recomp reecho rstVLT unsvcb warray wmxytb wrcomp
CALLed by:	rdrest

SUBROUTINE:	replen
PURPOSE:	Reads PLENUM data from a restart dump.
SOURCE file:	PlenumM.f90
CONTAINed in:	Plenum
INCLUDEs files:	junction
USEs MODULES:	Alloc CompTyp Flt Gen1DArray PlenVlt ReadEcho Restart SysConfig TextIo
CALLs:	AddSegment1D AllocPlenum Junctions SetSegment TRACAllo bfinn checksize reecho rstVLT warray wiarn
CALLed by:	rdrest

SUBROUTINE:	reprzr
PURPOSE:	Reads PRIZER (pressurizer) data from a restart dump.
SOURCE file:	PrizerM.f90
CONTAINed in:	Prizer
INCLUDEs files:	junction
USEs MODULES:	CompTyp Flt Gen1DArray GlobalDim IntArray PrizeVlt ReadEcho Restart SysConfig

CALLs:	AddSegment1D AllocGen1D Junctions SetSegment checksize recomp reecho rstVLT wrcomp
CALLed by:	rdrest

SUBROUTINE:	repump
PURPOSE:	Reads PUMP data from a restart dump.
SOURCE file:	PumpM.f90
CONTAINed in:	Pump
INCLUDEs files:	junction
USEs MODULES:	Alloc Bad CompTyp Flt Gen1DArray GlobalDim IntArray IntrType PumpVlt ReadEcho Restart SysConfig TextIo
CALLs:	AddSegment1D AllocGen1D Junctions SetSegment TRACAllo bfinn checksize recomp reecho rstVLT unsvcb warray wmxytb wrcomp
CALLed by:	rdrest

SUBROUTINE:	rerod1
PURPOSE:	Reads HTSTR input-data arrays from a restart dump.
SOURCE file:	RodTaskM.f90
CONTAINed in:	RodTask
USEs MODULES:	EngUnits Flt Global GlobalDim Io Restart RodVlt TextIo Util
CALLs:	bfinn bfins uncnvt unnumb unsvcb warray wiarn wmxytb
CALLed by:	rehtst

SUBROUTINE:	resepd
PURPOSE:	Reads SEPD (Separator) data from a restart dump.
SOURCE file:	SepdM.f90
CONTAINed in:	Sepd
INCLUDEs files:	constant junction
USEs MODULES:	Alloc Bad Gen1DArray GlobalDim IntArray Io ReadEcho Restart SysConfig TextIo
CALLs:	AddSegment1D AllocGen1D Junctions SetSegment TRACAllo bfinn checksize recomp reecho rstVLT unsvcb warray wmxytb wrcomp
CALLed by:	rdrest

SUBROUTINE:	retee
PURPOSE:	Reads TEE data from a restart dump.
SOURCE file:	TeeM.f90
CONTAINed in:	Tee
INCLUDEs files:	constant junction
USEs MODULES:	Alloc Bad CompTyp Flt Gen1DArray GlobalDat GlobalDim IntArray IntrType Io ReadEcho Restart SysConfig TeeVlt TextIo
CALLs:	AddSegment1D AllocGen1D Junctions SetSegment TRACAllo bfinn checksize recomp reecho rstVLT unsvcb warray wmxytb wrcomp

CALLed by:	rdrest
SUBROUTINE:	revlve
PURPOSE:	Reads VALVE data from a restart dump.
SOURCE file:	ValveM.f90
CONTAINed in:	Valve
INCLUDEs files:	junction
USEs MODULES:	Alloc CompTyp Flt Gen1DArray GlobalDim IntArray IntrType ReadEcho Restart SysConfig TextIo ValveVlt
CALLs:	AddSegment1D AllocGen1D Junctions SetSegment TRACAllo bfinn checksize recomp reecho rstVLT unsvcb warray wmxytb wrcomp
CALLed by:	rdrest
SUBROUTINE:	revssl
PURPOSE:	Reads VESSEL data from a restart dump.
SOURCE file:	VessTaskM.f90
CONTAINed in:	VessTask
INCLUDEs files:	constant junction
USEs MODULES:	CompTyp Eos Flt Global GlobalDat GlobalPnt Io ReadEcho Restart SysConfig TextIo Util VessArray VessArray3 VessCon VessMat VessTf3dc VessVlt
CALLs:	AddSegment3D AllocVess AllocVess3 Junctions SetSegment bfinn bfinni bfins clearn levelr reecho rstVLT warray wiarn
CALLed by:	rdrest
SUBROUTINE:	rfdbk
PURPOSE:	Evaluates the reactor core reactivity feedback caused by changes in the fuel temperature, coolant temperature, and coolant void from the beginning of the previous timestep.
SOURCE file:	RodCrunchM.f90
CONTAINed in:	RodCrunch
USEs MODULES:	CompTyp GlobalDat Util
CALLs:	error lint4d
CALLed by:	core1
SUBROUTINE:	rfill
PURPOSE:	Reads FILL data from input file.
SOURCE file:	FillM.f90
CONTAINed in:	Fill
INCLUDEs files:	junction
USEs MODULES:	CompTyp ControlDat EngUnits FillVlt Flt Gen1DArray Global GlobalDat GlobalPnt IntrType Io ReadEcho SysConfig TextIo Util

CALLs:	AllFillArrays AllocGen1D Junctions SetSegment checksize error linint0 loadn readi readr scltbl warray
CALLed by:	rdcomp

SUBROUTINE:	rholid
PURPOSE:	Evaluates the D2O liquid density and its derivatives.
SOURCE file:	EosNoInlineM.f90
CONTAINed in:	EosNoInline
CALLed by:	rholiq

SUBROUTINE:	rholih
PURPOSE:	Evaluates the H2O liquid density and its derivatives.
SOURCE file:	EosInlineM.f90
CONTAINed in:	EosInline
CALLed by:	rholiq thermh

SUBROUTINE:	rholiq
PURPOSE:	Determines the D2O or H2O liquid density and its derivatives by calling RHOLID or RHOLIH.
SOURCE file:	EosNoInlineM.f90
CONTAINed in:	EosNoInline
CALLs:	rholid rholih
CALLed by:	thermd

SUBROUTINE:	rhtstr
PURPOSE:	Reads ROD or SLAB HTSTR data from the input file.
SOURCE file:	RodTaskM.f90
CONTAINed in:	RodTask
INCLUDEs files:	constant decayc elvkf htcs ifcrs
USEs MODULES:	BadInput CompTyp ControlDat EngUnits Flt Global GlobalDat GlobalPnt Io ReadEcho RodVlt TextIo Util VessCon
CALLs:	error loadn pntrod readi readr rrod1 rrod2 uncnvt uncnvtn warray wiarn
CALLed by:	rdcomp

SUBROUTINE:	rkin
PURPOSE:	Solves the neutron point-reactor kinetics differential equations.
SOURCE file:	RodCrunchM.f90
CONTAINed in:	RodCrunch
INCLUDEs files:	decayc dlimit
USEs MODULES:	Control GlobalDat
CALLs:	error evfxxx trip
CALLed by:	core1

SUBROUTINE:	rlevel
PURPOSE:	Writes real VESSEL level array to output file TRCOUT (input echo).
SOURCE file:	VessCrunchM.f90
CONTAINed in:	VessCrunch
USEs MODULES:	BadInput Io TextIo VessCon
CALLs:	error levelr warray
CALLed by:	rvssl

SUBROUTINE:	rodht
PURPOSE:	Evaluates the fuel-rod temperature field.
SOURCE file:	RodCrunchM.f90
CONTAINed in:	RodCrunch
INCLUDEs files:	cnrslv constant ifcrs
USEs MODULES:	CompTyp Thermocple VessCon
CALLs:	bansol error trislv
CALLed by:	frod

SUBROUTINE:	rpipe
PURPOSE:	Reads PIPE data from the input file.
SOURCE file:	PipeM.f90
CONTAINed in:	Pipe
INCLUDEs files:	junction totals
USEs MODULES:	Alloc CompTyp EngUnits Flt Gen1DArray Gen1DTask Global GlobalDat IntArray IntrType Io PipeVlt ReadEcho SysConfig TextIo Util
CALLs:	AddSegment1D AllocGen1D Junctions SetSegment TRACAllo checksize error linint0 loadn rcomp readi readr scltbl uncnvt unsvcb warray wmxytb
CALLed by:	rdcomp

SUBROUTINE:	rplen
PURPOSE:	Reads PLENUM data from the input file.
SOURCE file:	PlenumM.f90
CONTAINed in:	Plenum
INCLUDEs files:	defval junction
USEs MODULES:	Alloc CompTyp Flt Gen1DArray PlenVlt ReadEcho SysConfig TextIo Util
CALLs:	AddSegment1D AllocPlenum Junctions SetSegment TRACAllo checksize clearn error loadn readi warray wiarn
CALLed by:	rdcomp

SUBROUTINE:	rprizr

PURPOSE:	Reads PRIZER (Pressurizer) data from input file.
SOURCE file:	PrizerM.f90
CONTAINed in:	Prizer
INCLUDEs files:	junction
USEs MODULES:	CompTyp Flt Gen1DArray Gen1DTask GlobalDim IntArray Io PrizeVlt ReadEcho SysConfig
CALLs:	AddSegment1D AllocGen1D Junctions SetSegment checksize rcomp readi readr
CALLed by:	rdcomp

SUBROUTINE:	rpump
PURPOSE:	Reads PUMP data from input file.
SOURCE file:	PumpM.f90
CONTAINed in:	Pump
INCLUDEs files:	elvkf junction
USEs MODULES:	Alloc Bad CompTyp ControlDat EngUnits Eos Flt Gen1DArray Gen1DTask GlobalDat GlobalDim GlobalPnt IntArray IntrType Io PumpVlt ReadEcho SysConfig TextIo Util
CALLs:	AddSegment1D AllocGen1D Junctions SetSegment TRACAllo checksize error linint0 loadn rcomp rdcrvs rddim readi readr scltbl thermo uncnvt unsvcb warray wmxytb
CALLed by:	rdcomp

SUBROUTINE:	rrod1
PURPOSE:	Reads basic ROD input parameters.
SOURCE file:	RodCrunchM.f90
CONTAINed in:	RodCrunch
INCLUDEs files:	decayc
USEs MODULES:	EngUnits Flt Io ReadEcho RodVlt
CALLs:	error readi readr unnumb unsvcb
CALLed by:	rhtstr

SUBROUTINE:	rrod2
PURPOSE:	Reads and checks array data for powered heat structures.
SOURCE file:	RodTaskM.f90
CONTAINed in:	RodTask
INCLUDEs files:	decayc
USEs MODULES:	EngUnits Flt Global GlobalDim Io RodVlt TextIo Util
CALLs:	clearn decays error linint0 loadn scltbl uncnvt uncnvtn unnumb unsvcb warray wlabrn wmxytb zpwnrm
CALLed by:	rhtstr

SUBROUTINE:	rsepd

PURPOSE:	Reads SEPD (Separator) data from input file.
SOURCE file:	SepdM.f90
CONTAINed in:	Sepd
INCLUDEs files:	cflow constant junction totals
USEs MODULES:	Alloc Bad EngUnits Gen1DArray Gen1DTask IntArray Io ReadEcho SysConfig TextIo Util
CALLs:	Add Segment1D AllocGen1D Junctions SetSegment TRACAllo checksize error linint0 loadn rcomp readi readr scltbl uncnvt unsvcb warray wmxytb
CALLed by:	rdcomp

SUBROUTINE:	rsgnf
PURPOSE:	
SOURCE file:	DataSgnfM.f90
CONTAINed in:	DataSgnf

SUBROUTINE:	rstVLT
PURPOSE:	Driver routine that reads the component-specific VLTs from the restart file.
SOURCE file:	rstvlt.f90
USEs MODULES:	BreakVlt CompTyp FillVlt IntrType PipeVlt PlenVlt PrizeVlt PumpVlt RodVlt SepdVlt TeeVlt ValveVlt VessVlt
CALLs:	BreakTableRst FillTableRst PipeTableRst PlenTableRst PrizeTableRst PumpTableRst RodTableRst SepdTableRst TeeTableRst ValveTableRst VessTableRst error
CALLed by:	rebrk refill rehtst repipe replen reprzr repump resepd retee revlve revssl

SUBROUTINE:	rtee
PURPOSE:	Reads TEE data from input file.
SOURCE file:	TeeM.f90
CONTAINed in:	Tee
INCLUDEs files:	cflow constant junction totals
USEs MODULES:	Alloc Bad CompTyp EngUnits Flt Gen1DArray Gen1DTask Global GlobalDat IntArray IntrType Io ReadEcho SysConfig TeeVlt TextIo Util
CALLs:	Add Segment1D AllocGen1D Junctions SetSegment TRACAllo checksize error linint0 loadn rcomp readi readr scltbl uncnvt unsvcb warray wmxytb
CALLed by:	rdcomp

SUBROUTINE:	rvlve
PURPOSE:	Reads VALVE data from input file.

SOURCE file:	ValveM.f90
CONTAINed in:	Valve
INCLUDEs files:	junction
USEs MODULES:	Alloc CompTyp ControlDat EngUnits Eos Flt Gen1DArray Gen1DTask GlobalDat GlobalDim GlobalPnt IntArray IntrType Io ReadEcho SysConfig TextIo Util ValveVlt
CALLs:	AddSegment1D AllocGen1D Junctions SetSegment TRACAllo checksize error faxpos linint0 loadn rcomp readi readr scltbl thermo uncnvts unsvcb warray wmxytb
CALLed by:	rdcomp

SUBROUTINE:	rvssl
PURPOSE:	Reads VESSEL data from input file.
SOURCE file:	VessTaskM.f90
CONTAINed in:	VessTask
INCLUDEs files:	constant defval elvkf junction
USEs MODULES:	CFaces Ccfl CompTyp EngUnits Eos Flt Global GlobalDat GlobalPnt Io ReadEcho SysConfig TextIo Util VessArray VessArray3 VessCon VessMat VessTf3dc VessVlt
CALLs:	AddSegment3D AllocVess AllocVess3 Junctions SetSegment chksr clearn error levelr loadn readi readr rlevel uncnvts warray wiarn
CALLed by:	input

SUBROUTINE:	savbd
PURPOSE:	Moves boundary information into component arrays.
SOURCE file:	Gen1DTaskM.f90
CONTAINed in:	Gen1DTask
USEs MODULES:	Bad Flt Gen1DArray GlobalDat GlobalDim
CALLs:	TimeUpGen1D
CALLed by:	pipe1 pipe3 prizr1 prizr3 pump1 pump3 tee1 tee3 vlve1 vlve3

SUBROUTINE:	sclmom
PURPOSE:	Sets up geometric scale factors for velocities to improve momentum conservation.
SOURCE file:	VessCrunchM.f90
CONTAINed in:	VessCrunch
USEs MODULES:	Io OneDDat VessArray3 VessCon VessTf3dc VessVlt
CALLs:	error
CALLed by:	ivssl

SUBROUTINE:	scltbl
PURPOSE:	Scales input table according to scale factor passed by input routine using allocated arrays.

SOURCE file: TextIoM.f90
CONTAINed in: TextIo
CALLs: unsvcb warray wmxytb
CALLed by: rbreak rfill rpipe rpump rrod2 rsepd rtee rvlve

SUBROUTINE: scopym
PURPOSE: Support subroutine for sgeev that copies one vector into another.
SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLed by: sgeev

SUBROUTINE: scopyt
PURPOSE: Support subroutine for sgeev that copies the negative of one vector into another.
SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLed by: sgeev

SUBROUTINE: sdmpit
PURPOSE: Calculates the TRAC data significance parameters and writes them to the trcsno file.
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
USEs MODULES: Break Fill Pipe Plenum Prizer Pump RodVlt Tee Valve VessTask
CALLs: sgnf3d sgnfpipe sgnfplen sgnfprzr sgnfpump sgnftee sgnfvlve sgnhtstr
CALLed by: pstepq

SUBROUTINE: sedit
PURPOSE: Writes short edit to TRCOUT file.
SOURCE file: sedit.f90
INCLUDEs files: dlimit
USEs MODULES: EngUnits Global GlobalDat GlobalPnt IntrType Io SysTime Util
CALLs: cleari uncnvts
CALLed by: edit newdlt pstepq

SUBROUTINE: sepd1 ***Not CALLed in Version 3.0.***
PURPOSE: Controls SEPD (Separator) prep stage.
SOURCE file: SepdM.f90
CONTAINed in: Sepd
USEs MODULES: ControlDat Io OneDDat
CALLs: error sepdx tee1

SUBROUTINE:	sepd2
PURPOSE:	Controls SEPD (Separator) `outer` stage stage.
SOURCE file:	SepdM.f90
CONTAINed in:	Sepd
USEs MODULES:	Gen1DArray OneDDat
CALLs:	sepdi tee2
CALLed by:	out1d

SUBROUTINE:	sepd3
PURPOSE:	Controls SEPD (Separator) post stage.
SOURCE file:	SepdM.f90
CONTAINed in:	Sepd
USEs MODULES:	Gen1DArray OneDDat
CALLs:	tee3
CALLed by:	post

SUBROUTINE:	sepdi
PURPOSE:	Computes separator side-arm void fraction and mixture velocity.
SOURCE file:	SepdM.f90
CONTAINed in:	Sepd
INCLUDEs files:	constant
USEs MODULES:	Gen1DArray GlobalDim IntrType
CALLed by:	sepd2

SUBROUTINE:	sepdx
PURPOSE:	Computes mechanistic separator carryover and carry-under quantities.
SOURCE file:	SepdM.f90
CONTAINed in:	Sepd
INCLUDEs files:	constant
USEs MODULES:	Boundary Gen1DArray IntrType TeeVlt
CALLs:	ssepor
CALLed by:	sepd1

SUBROUTINE:	set3dbd
PURPOSE:	
SOURCE file:	VessTaskM.f90
CONTAINed in:	VessTask
USEs MODULES:	Bad Bits Boundary CFaces GlobalDat SysService VessArray VessArray3 VessCon VessTf3dc VessVlt
CALLs:	of1123c

CALLed by: ivssl post3d vssl1 vssl2 vssl3

SUBROUTINE: setbd
PURPOSE: Stores component information in bd arrays.
SOURCE file: Gen1DTaskM.f90
CONTAINed in: Gen1DTask
USEs MODULES: Bad Flt
CALLs: j1d

SUBROUTINE: setbdt
PURPOSE: Sets values for boundary to first theta cell equal to values for last theta cell and sets values for boundary to last theta cell equal to values for first theta cell.
SOURCE file: VessCrunchM.f90
CONTAINed in: VessCrunch
USEs MODULES: VessArray3 VessCon VessVlt
CALLed by: ivssl vssl1 vssl2

SUBROUTINE: seteod
PURPOSE: Defines the EOS constants for D2O fluid.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline
CALLed by: seteos

SUBROUTINE: seteoh
PURPOSE: Defines the EOS constants for H2O fluid.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline
CALLed by: seteos

SUBROUTINE: seteos
PURPOSE: Defines the EOS constants for D2O or H2O fluid by calling `seteod` or `seteoh`.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline
CALLs: seteod seteoh
CALLed by: input

SUBROUTINE: setnet
PURPOSE: Provides the information needed to set up the network solution matrices.
SOURCE file: setnet.f90
USEs MODULES: IntrType

CALLed by: icomp

SUBROUTINE: settype
PURPOSE: Sets the component type number (e.g., 1) based on the component name (e.g., PIPE).
SOURCE file: CompTypM.f90
CONTAINed in: CompTyp
CALLs: error
CALLed by: input

SUBROUTINE: setva
PURPOSE: Sets value of variable `var` to `val` for one level of VESSEL data.
SOURCE file: VessCrunchM.f90
CONTAINed in: VessCrunch
USEs MODULES: VessCon
CALLed by: dvpscl htstrv ifset initbc iwall3 rdzmom vssl1

SUBROUTINE: sfa22v
PURPOSE: Hardwired version of `sgefat` for 2 x 2 matrices evaluated as an `nmat`-element vector.
SOURCE file: LinearM.f90
CONTAINed in: Linear

SUBROUTINE: sfa33v
PURPOSE: Hardwired version of `sgefat` for 3 x 3 matrices evaluated as an `nmat`-element vector.
SOURCE file: LinearM.f90
CONTAINed in: Linear

SUBROUTINE: sfa44
PURPOSE: Hardwired version of `sgefat` for a 4 x 4 matrix.
SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLed by: BlockSolver tf1ds tfpln

SUBROUTINE: sfa44v
PURPOSE: Hardwired version of `sgefat` for 4 x 4 matrices evaluated as an `nmat`-element vector.
SOURCE file: LinearM.f90
CONTAINed in: Linear

SUBROUTINE: sfa55
PURPOSE: Handwired version of `sgefat` for a 5 x 5 matrix.

SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLed by: BlockSolver bkspln bksstb bkstb3 tf1ds tf3ds tfpln

SUBROUTINE: sfa55v
PURPOSE: Hardwired version of `sgefat` for 5 x 5 matrices evaluated as an `nmat`-element vector.
SOURCE file: LinearM.f90
CONTAINed in: Linear

SUBROUTINE: sgecot
PURPOSE: Factors a real matrix by Gaussian elimination and estimates the condition of the matrix.
SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLs: saxpyt sgefat sscalt
CALLed by: sgefst

SUBROUTINE: sgedit
PURPOSE: Computes the determinant of a matrix using the factors computed by `sgefat`.
SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLed by: choke

SUBROUTINE: sgeev
PURPOSE: Computes the eigenvalues and eigenvectors of a general real matrix. `sgefat` factors a real matrix by Gaussian elimination.
SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLs: balanct balbakt error hqr2t hqrt orthest ortrant scopym scopyt
CALLed by: choke

SUBROUTINE: sgefat
PURPOSE: Factors a real matrix by Gaussian elimination.
SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLed by: Solver choke matsol sgecot

SUBROUTINE: sgefst
PURPOSE: Solves an N x N system of linear equations by calling `sgecot` and `sgeslt`.
SOURCE file: LinearM.f90

CONTAINed in: Linear
CALLs: error sgecot sgeslt

SUBROUTINE: sgeslt
PURPOSE: Solves the real system A * X = B or TRANS(A) * X = B using the factors computed by `sgefat`.
SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLed by: Solver choke matsol sgefst

SUBROUTINE: sgnf1d
PURPOSE: Calculates for 1D-components' significance data parameters.
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
USEs MODULES: Gen1DArray
CALLed by: sgnfpipe sgnfprzr sgnfpump sgnftee sgnfvlve

SUBROUTINE: sgnf3d
PURPOSE: Calculates for 3D-components' significance data parameters.
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
USEs MODULES: CFaces VessArray3 VessCon VessVlt
CALLed by: sdmpit

SUBROUTINE: sgnfetup
PURPOSE: Allocates the significance data arrays by the number of components in a model, calculates the total volume for each component, sets the volume factor flag for the pressurizer component for steady-state calculations, and writes to the significance data output file the number of components, component type, and number.
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
USEs MODULES: Break Fill Pipe Plenum Prizer Pump RodVlt Tee Valve VessTask
CALLs: sgnfvol3d vsgnfpipe vsgnfplen vsgnfprzr vsgnfpump vsgnftee vsgnfvlve vsgnhtstr
CALLed by: trac

SUBROUTINE: sgnfpipe
PURPOSE: Calculates the significance data parameters for a PIPE.
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
USEs MODULES: Gen1DArray PipeVlt
CALLs: sgnf1d

CALLed by: sdmpit

SUBROUTINE: sgnfplen
PURPOSE: Calculates the significance data parameters for a PLENUM.
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
USEs MODULES: Gen1DArray
CALLed by: sdmpit

SUBROUTINE: sgnfprzr
PURPOSE: Calculates the significance data parameters for a PRIZER (Pressurizer).
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
USEs MODULES: Gen1DArray PrizeVlt
CALLs: sgnf1d
CALLed by: sdmpit

SUBROUTINE: sgnfpump
PURPOSE: Calculates the significance data parameters for a PUMP.
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
USEs MODULES: Gen1DArray PumpVlt
CALLs: sgnf1d
CALLed by: sdmpit

SUBROUTINE: sgnftee
PURPOSE: Calculates the significance data parameters for a TEE.
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
USEs MODULES: Gen1DArray TeeVlt
CALLs: sgnf1d
CALLed by: sdmpit

SUBROUTINE: sgnfvlve
PURPOSE: Calculates the significance data parameters for a VALVE.
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
USEs MODULES: Gen1DArray ValveVlt
CALLs: sgnf1d
CALLed by: sdmpit

SUBROUTINE: sgnfvol1d
PURPOSE: Calculates the total volume of all 1D real cells.
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
USEs MODULES: Gen1DArray
CALLed by: vsgnfpipe vsgnfprzr vsgnfpump vsgnftee vsgnfvlve

SUBROUTINE: sgnfvol3d
PURPOSE: Calculates the total volume of all 3D real cells.
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
USEs MODULES: VessArray3 VessCon VessTf3dc VessVlt
CALLed by: sgnfetup

SUBROUTINE: sgnhtstr
PURPOSE: calculates significance data parameters for heat structures.
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
INCLUDEs files: constant
USEs MODULES: HSArray RodVlt
CALLed by: sdmpit

SUBROUTINE: shiftb
PURPOSE: Translates the table's abscissa-coordinate values so that the function value F in the table corresponds to an abscissa-coordinate value of 0.0.
SOURCE file: UtilM.f90
CONTAINed in: Util
CALLed by: break1 breakx fillx pumpsr vlvex

SUBROUTINE: shrink
PURPOSE: Removes rows of conduction nodes within the HTSTR RODs or SLABs during reflood.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
CALLed by: core1

SUBROUTINE: sound
PURPOSE: Performs a homogeneous-equilibrium, sound-speed calculation.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline
CALLs: error therms

CALLed by: choke

SUBROUTINE: split
PURPOSE: Reads appropriate data from PUMP curves.
SOURCE file: PumpSourceM.f90
CONTAINed in: PumpSource
USEs MODULES: IntrType Io
CALLed by: getcrv

SUBROUTINE: srtlp
PURPOSE: Sorts components into loops and reorders them for the network solution.
SOURCE file: srtlp.f90
INCLUDEs files: junction
USEs MODULES: CompTyp GlobalDim IntrType Io Util
CALLs: cleari error
CALLed by: input

SUBROUTINE: ssepor
PURPOSE: Performs detailed calculation of a steam-water separator.
SOURCE file: SepdM.f90
CONTAINed in: Sepd
USEs MODULES: IntrType
CALLed by: sepdx

SUBROUTINE: ssl22v
PURPOSE: Hardwired version of `sgeslt` for 2 x 2 matrices evaluated as an `nmat`-element vector.
SOURCE file: LinearM.f90
CONTAINed in: Linear

SUBROUTINE: ssl33v
PURPOSE: Hardwired version of `sgeslt` for 3 x 3 matrices evaluated as an `nmat`-element vector.
SOURCE file: LinearM.f90
CONTAINed in: Linear

SUBROUTINE: ssl44
PURPOSE: Hardwired version of sgeslt for a 4 x 4 matrix.
SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLed by: BlockSolver tf1ds tfpln

SUBROUTINE: ssl44v
PURPOSE: Hardwired version of `sgeslt` for 4 x 4 matrices evaluated as an `nmat`-element vector.
SOURCE file: LinearM.f90
CONTAINed in: Linear

SUBROUTINE: ssl55
PURPOSE: Hardwired version of `sgeslt` for a 5 x 5 matrix.
SOURCE file: LinearM.f90
CONTAINed in: Linear
CALLed by: BlockSolver bkspln bksstb bkstb3 tf1ds tf3ds tfpln

SUBROUTINE: ssl55v
PURPOSE: Hardwired version of `sgeslt` for 5 x 5 matrices evaluated as an `nmat`-element vector.
SOURCE file: LinearM.f90
CONTAINed in: Linear

SUBROUTINE: startClock
PURPOSE: Starts the system clock.
SOURCE file: SysTimeM.f90
CONTAINed in: SysTime
CALLs: SYSTEM_CLOCK

SUBROUTINE: stbme
PURPOSE: Sets up the 1D stabilizing mass and energy equations.
SOURCE file: Gen1DCrunchM.f90
CONTAINed in: Gen1DCrunch
USEs MODULES: Bad Bits CFaces CompTyp Global GlobalDat Matrices OneDDat SysConfig
CALLed by: constb

SUBROUTINE: stbme3 ***Not CALLed in Version 3.0.***
PURPOSE: Sets up stabilizer mass and energy equations for the VESSEL component.
SOURCE file: VessCrunchM.f90
CONTAINed in: VessCrunch
USEs MODULES: Bits Boundary CFaces GlobalDat GlobalDim SysService VessArray3 VessCon VessTf3dc VessVlt

SUBROUTINE: stbmpl
PURPOSE: Sets up the stabilizing mass and energy equations for the PLENUM component.

SOURCE file: PlenumM.f90
CONTAINed in: Plenum
USEs MODULES: Gen1DArray Matrices OneDDat PlenVlt SysConfig
CALLed by: plen3

SUBROUTINE: steady
PURPOSE: Generates a steady-state solution.
SOURCE file: steady.f90
INCLUDEs files: diddlh massck
USEs MODULES: Bad Boundary ControlDat EngUnits GlobalDat GlobalDim GlobalPnt IntrType Io Restart SysService TimeStep Xtv
CALLs: TableTransAll clean edit error hout post prep pstepq rdcrds timchk timstp xtvdr
CALLed by: trac

SUBROUTINE: stopClock
PURPOSE: Stops the system clock.
SOURCE file: SysTimeM.f90
CONTAINed in: SysTime
CALLs: SYSTEM_CLOCK

SUBROUTINE: svset
PURPOSE: Calls `svset1`, `svset3`, and `svseth` to determine location-dependent signal-variable parameters.
SOURCE file: ControlM.f90
CONTAINed in: Control
USEs MODULES: Flt
CALLs: error svset1 svset3 svseth
CALLed by: trips

SUBROUTINE: svset1
PURPOSE: Evaluates signal-variable parameters with locations defined in 1D hydraulic components.
SOURCE file: ControlM.f90
CONTAINed in: Control
INCLUDEs files: constant
USEs MODULES: Alloc Flt Gen1DArray HeatArray PumpVlt TeeVlt ValveVlt
CALLs: CopyGen1DArray GetGen1DArray GetHeatArray GetPumpTab GetValveTab error
CALLed by: svset

SUBROUTINE: svset3

PURPOSE: Evaluates signal-variable parameters with locations defined in a 3D VESSEL component.
SOURCE file: ControlM.f90
CONTAINed in: Control
USEs MODULES: Flt VessArray VessArray3 VessCon VessCrunch VessVlt
CALLs: error
CALLed by: svset

SUBROUTINE: svseth
PURPOSE: Evaluates signal-variable parameters defined in an HTSTR component.
SOURCE file: ControlM.f90
CONTAINed in: Control
USEs MODULES: Flt HSArray RodVlt
CALLs: GetRodTab error
CALLed by: svset

SUBROUTINE: tbc1
PURPOSE: Stores the TEE internal-junction momentum term and set flag when a JCELL main-channel interface is a TEE external junction.
SOURCE file: TeeM.f90
CONTAINed in: Tee
USEs MODULES: Boundary IntrType SysService Util
CALLed by: tee1

SUBROUTINE: tee1
PURPOSE: Controls TEE prepass.
SOURCE file: TeeM.f90
CONTAINed in: Tee
USEs MODULES: Boundary CompTyp Flt Gen1DArray Gen1DTask GlobalDat GlobalPnt HeatArray IntrType OneDDat SysService TeeVlt
CALLs: TableTransComp bkmom jbd4 preper savbd tbc1 tee1x teex
CALLed by: prep1d sepd1

SUBROUTINE: tee1x
PURPOSE: Evaluates SOURCE for TEE side-leg hydrodynamics.
SOURCE file: TeeM.f90
CONTAINed in: Tee
USEs MODULES: Bad Control GlobalDat IntrType TeeVlt
CALLs: evfxxx
CALLed by: tee1

SUBROUTINE: tee2

PURPOSE: Controls TEE `outer` iteration.
SOURCE file: TeeM.f90
CONTAINed in: Tee
USEs MODULES: Bits Boundary CFaces CompTyp Flt Gen1DArray Gen1DTask GlobalDat IntrType OneDDat SysService TeeVlt
CALLs: inner
CALLed by: out1d sepd2

SUBROUTINE: tee3
PURPOSE: Controls TEE postpass.
SOURCE file: TeeM.f90
CONTAINed in: Tee
INCLUDEs files: constant
USEs MODULES: Bits Boundary CFaces CompTyp Control EvalDF Flt Gen1DArray Gen1DTask GlobalDat IntrType OneDDat SysService TeeVlt
CALLs: constb etee evaldf1d evaldf2d evfxxx offtke poster savbd
CALLed by: post sepd3

SUBROUTINE: teex
PURPOSE: Evaluates coefficients for flow-coupling at the TEE internal junction.
SOURCE file: TeeM.f90
CONTAINed in: Tee
USEs MODULES: IntrType OneDDat
CALLed by: tee1

SUBROUTINE: tf1d
PURPOSE: Controls 1D hydrodynamics routines in `outer` stage.
SOURCE file: Gen1DTaskM.f90
CONTAINed in: Gen1DTask
USEs MODULES: Bad Eos Gen1DArray Gen1DCrunch GenHeat Global GlobalDat GlobalPnt IntArray IntrType JunTerms Network OneDDat SemiSolver Xvol
CALLs: CellFluxes CellLogic EdgeAvg1D JunFluxes1D cellav htif tf1ds tf1ds1 tf1ds3 thermo
CALLed by: inner

SUBROUTINE: tf1ds
PURPOSE: Solves the hydrodynamic equations for the 1D, two-fluid pipe model (`outer` stage).
SOURCE file: Gen1DCrunchM.f90
CONTAINed in: Gen1DCrunch
INCLUDEs files: diddle diddlh diddli rows

USEs MODULES:	Bad Bits CFaces CompTyp Eos Flt GlobalDat GlobalDim Linear Matrices OneDDat SysConfig Xvol
CALLs:	sfa44 sfa55 ssl44 ssl55
CALLed by:	tf1d

SUBROUTINE:	tf1ds1
PURPOSE:	Sets up initial velocity approximations and their pressure derivatives for the 1D, two-fluid pipe model (`outer` stage).
SOURCE file:	Gen1DCrunchM.f90
CONTAINed in:	Gen1DCrunch
INCLUDEs files:	cflow constant dtinfo tst3d vdvmod vellim
USEs MODULES:	Bad Bits CFaces Ccfl CompTyp Flt GlobalDat GlobalDim OneDDat Util
CALLs:	choke
CALLed by:	tf1d

SUBROUTINE:	tf1ds3
PURPOSE:	Performs final generation of new time pressures, temperatures, and void fractions for 1D components in subroutine `outer`'s second pass.
SOURCE file:	Gen1DCrunchM.f90
CONTAINed in:	Gen1DCrunch
USEs MODULES:	Bad Bits CFaces CompTyp Eos FailDat Flt GlobalDat GlobalDim Io Matrices OneDDat RodGlobal SysConfig
CALLs:	thermo
CALLed by:	tf1d

SUBROUTINE:	tf3ds
PURPOSE:	Sets up basic mass and energy equations for 3D VESSEL component (`outer` stage).
SOURCE file:	VessTF3DSM.f90
CONTAINed in:	VessTF3DS
INCLUDEs files:	diddle diddli tst3d
USEs MODULES:	Bits Boundary CFaces Eos Flt GlobalDat Io Linear Matrices SysService VessArray3 VessCon VessTf3dc VessTo1D VessVlt Xvol
CALLs:	Therm3D error sfa55 ssl55
CALLed by:	vssl2

SUBROUTINE:	tf3ds1
PURPOSE:	Estimates new-time velocities from motion equation and evaluates variation of velocities with respect to pressure for 3D VESSEL component (`outer` stage).
SOURCE file:	VessTF3DSM.f90

CONTAINed in:	VessTF3DS
INCLUDEs files:	constant tst3d vdvmod
USEs MODULES:	Bits CFaces Ccfl Eos Flt GlobalDat VessArray3 VessCon VessTf3dc VessVlt
CALLs:	velbc zerov
CALLed by:	vssl2

SUBROUTINE:	tf3ds3
PURPOSE:	Performs final generation of new time pressures, temperatures, and void fractions for VESSEL components in subroutine `outer`'s second pass.
SOURCE file:	VessTF3DSM.f90
CONTAINed in:	VessTF3DS
USEs MODULES:	Bits Boundary CFaces Eos FailDat Flt GlobalDat GlobalDim Io Matrices SysConfig VessArray VessArray3 VessCon VessTf3dc VessTo1D VessVlt
CALLs:	Therm3D
CALLed by:	vssl2

SUBROUTINE:	tfplbk
PURPOSE:	Does final generation of new time pressures, temperatures, and void fractions for PLENUM components in subroutine `outer`'s second pass.
SOURCE file:	PlenumM.f90
CONTAINed in:	Plenum
USEs MODULES:	Boundary CFaces Eos FailDat Flt Gen1DArray Matrices OneDDat PlenVlt SysConfig
CALLs:	thermo
CALLed by:	plen2

SUBROUTINE:	tfpln
PURPOSE:	Solves the basic hydrodynamic equations for the PLENUM (similar to `tf1ds` for the other 1D components).
SOURCE file:	PlenumM.f90
CONTAINed in:	Plenum
INCLUDEs files:	diddle rows
USEs MODULES:	Boundary CFaces Eos Gen1DArray Linear Matrices OneDDat PlenVlt SysConfig Xvol
CALLs:	sfa44 sfa55 ssl44 ssl55
CALLed by:	plen2

SUBROUTINE:	thermd

PURPOSE:	Evaluates the thermodynamic properties of D2O using allocated arrays.
SOURCE file:	EosNoInlineM.f90
CONTAINed in:	EosNoInline
USEs MODULES:	GlobalDat GlobalDim
CALLs:	error error rholiq
CALLed by:	thermo therms

SUBROUTINE:	thermh
PURPOSE:	Evaluates the thermodynamic properties of H2O using allocated arrays.
SOURCE file:	EosNoInlineM.f90
CONTAINed in:	EosNoInline
USEs MODULES:	GlobalDat GlobalDim
CALLs:	error rholih
CALLed by:	thermo therms

SUBROUTINE:	thermo
PURPOSE:	Determines the thermodynamic properties of D2O or H2O by calling `thermd` or `thermh`.
SOURCE file:	EosNoInlineM.f90
CONTAINed in:	EosNoInline
USEs MODULES:	GlobalDim
CALLs:	thermd thermh
CALLed by:	Therm3D break3 breakx fillx ibrk ifill iplen iprop plen2 plen3 poster rpump rvlve tf1d tf1ds3 tfplbk

SUBROUTINE:	therms
PURPOSE:	Determines the thermodynamic properties of D2O or H2O by calling `thermdo` or `thermho` with scalar argunments.
SOURCE file:	EosNoInlineM.f90
CONTAINed in:	EosNoInline
USEs MODULES:	GlobalDim
CALLs:	thermd thermh
CALLed by:	choke ihpss1 ihpss3 rcomp sound

SUBROUTINE:	timchk
PURPOSE:	Checks elapsed time to see whether certain functions should be performed.
SOURCE file:	timchk.f90
USEs MODULES:	ControlDat GlobalDat GlobalPnt IntrType Restart SysTime
CALLs:	dmpit edit error
CALLed by:	steady trans

SUBROUTINE:	timstp
PURPOSE:	Sets up timestep and time-edit interval times.
SOURCE file:	TimeStepM.f90
CONTAINed in:	TimeStep
INCLUDEs files:	constant dlimit
USEs MODULES:	BadInput Control EngUnits FailDat GlobalDat GlobalPnt Io ReadEcho Restart
CALLs:	error newdlt readr trip uncnvt
CALLed by:	steady trans

SUBROUTINE:	timupd
PURPOSE:	Updates start-of-timestep values with end-of-timestep values for one VESSEL level.
SOURCE file:	VessCrunchM.f90
CONTAINed in:	VessCrunch
USEs MODULES:	GlobalDat VessArray3 VessCon VessTf3dc VessVlt
CALLed by:	vssl1

SUBROUTINE:	tmpptr
PURPOSE:	Sets up temporary pointers for subroutines `preifd` and `prefwd`.
SOURCE file:	VectDragM.f90
CONTAINed in:	VectDrag
CALLed by:	prefwd

SUBROUTINE:	tmsfb
PURPOSE:	Evaluates the minimum stable film-boiling temperature (T_{min}).
SOURCE file:	HeatCorM.f90
CONTAINed in:	HeatCor
CALLed by:	htcor

SUBROUTINE:	trans
PURPOSE:	Controls the overall transient-mode calculation for each timestep.
SOURCE file:	trans.f90
INCLUDEs files:	diddlh massck
USEs MODULES:	Bad Boundary ControlDat GlobalDat GlobalDim GlobalPnt IntrType Io SysService TimeStep Xtv
CALLs:	TableTransAll dmpit edit error hout post prep pstepq timchk timstp xtvdr
CALLed by:	trac

SUBROUTINE:	trip
PURPOSE:	Returns the status of a trip.

SOURCE file: ControlM.f90
CONTAINed in: Control
CALLs: error
CALLed by: breakx core1 evfxxx fillx pumpsr rkin timstp vlvex wpump

SUBROUTINE: trips
PURPOSE: Evaluates the control parameters for the beginning of the timestep system state.
SOURCE file: ControlM.f90
CONTAINed in: Control
CALLs: cbset error svset trpset
CALLed by: prep

SUBROUTINE: trislv
PURPOSE: Solves linear system of the form A * X = B, where A is tridiagonal.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
CALLed by: rodht

SUBROUTINE: trpset
PURPOSE: Sets up trip status flags.
SOURCE file: ControlM.f90
CONTAINed in: Control
INCLUDEs files: dtinfo
CALLs: error uncnvts unnumb
CALLed by: trips

SUBROUTINE: uncnvt
PURPOSE: Converts a parameter's value from SI to English units or from English to SI units using undimensioned arrays.
SOURCE file: EngUnitsM.f90
CONTAINed in: EngUnits
USEs MODULES: BadInput Io
CALLs: LuMatch error
CALLed by: ecomp edit input ivssl namlst rcomp rerod1 rhtstr rpipe rpump rrod2 rsepd rtee timstp uncnvts warray wbreak wcomp wfill whtstr wlevel wmxytb wpipe wplen wprizr wpump wsepd wtee wvlve wvssl

SUBROUTINE: uncnvtn
PURPOSE: Converts a parameter's value from SI to English units or from English to SI units using allocated arrays.
SOURCE file: EngUnitsM.f90
CONTAINed in: EngUnits

USEs MODULES: BadInput Io
CALLs: LuMatch error
CALLed by: rhtstr rrod2

SUBROUTINE: uncnvts
PURPOSE: Provides scalar interface to uncnvt.
SOURCE file: EngUnitsM.f90
CONTAINed in: EngUnits
CALLs: error uncnvt
CALLed by: core1 ecomp elgr hout htstr1 ihpss1 input irod rcntl readr reecho rvlve rvssl sedit trpset whtstr

SUBROUTINE: unnumb
PURPOSE: Assigns the units-label number to a parameter name in array LABELS for English/SI conversions.
SOURCE file: EngUnitsM.f90
CONTAINed in: EngUnits
USEs MODULES: BadInput Io
CALLs: LuMatch error
CALLed by: input rcntl recntl rehtst rerod1 rrod1 rrod2 trpset

SUBROUTINE: unsvcb
PURPOSE: Determines the units label and units-label number of a signal variable or control block.
SOURCE file: unsvcb.f90
USEs MODULES: BadInput ControlDat EngUnits GlobalPnt IntrType Io
CALLs: error
CALLed by: rcntl recntl rehtst repipe repump rerod1 resepd retee revlve rpipe rpump rrod1 rrod2 rsepd rtee rvlve scltbl warray

SUBROUTINE: value
PURPOSE: Converts an ASCII string to its binary value.
SOURCE file: PreInputM.f90
CONTAINed in: PreInput
USEs MODULES: Util
CALLed by: preinp

SUBROUTINE: velbc
PURPOSE: Sets velocities at internal FILL boundaries for a VESSEL.
SOURCE file: VessTF3DSM.f90
CONTAINed in: VessTF3DS
USEs MODULES: CFaces VessArray3 VessCon VessVlt
CALLed by: tf3ds1

SUBROUTINE: vfwall3
PURPOSE: Evaluates 3D wall shear coefficients.
SOURCE file: vfwall3.f90
USEs MODULES: IntrType
CALLs: wdrag
CALLed by: prefwd

SUBROUTINE: vlve1
PURPOSE: Controls VALVE prepass.
SOURCE file: ValveM.f90
CONTAINed in: Valve
USEs MODULES: Boundary Flt Gen1DArray Gen1DTask GlobalDat HeatArray IntrType OneDDat SysService ValveVlt
CALLs: TableTransComp bkmom preper savbd vlvex
CALLed by: prep1d

SUBROUTINE: vlve2
PURPOSE: Controls VALVE `outer` iteration.
SOURCE file: ValveM.f90
CONTAINed in: Valve
USEs MODULES: Boundary Gen1DTask GlobalDat IntrType OneDDat SysService ValveVlt
CALLs: inner
CALLed by: out1d

SUBROUTINE: vlve3
PURPOSE: Controls VALVE postpass.
SOURCE file: ValveM.f90
CONTAINed in: Valve
USEs MODULES: Boundary Control EvalDF Flt Gen1DArray Gen1DTask GlobalDat IntrType OneDDat SysService ValveVlt
CALLs: constb evaldf1d evaldf2d evfxxx poster savbd
CALLed by: post

SUBROUTINE: vlvex
PURPOSE: Evaluates the value of the flow-area change action for a VALVE.
SOURCE file: ValveM.f90
CONTAINed in: Valve
INCLUDEs files: dlimit
USEs MODULES: Control Flt Gen1DArray GlobalDat GlobalPnt IntrType Util ValveVlt
CALLs: evltab faxpos shiftb trip

CALLed by: vlve1

SUBROUTINE: vmcell
PURPOSE: Converts a VESSEL cell number to a VESSEL-matrix cell number.
SOURCE file: TracInputM.f90
CONTAINed in: TracInput
USEs MODULES: IntrType
CALLed by: input

SUBROUTINE: volfa
PURPOSE: Evaluates cell volume flow areas.
SOURCE file: Gen1DInitM.f90
CONTAINed in: Gen1DInit
USEs MODULES: GlobalDat Io
CALLed by: ipipe iprizr ipump itee ivlve

SUBROUTINE: volv
PURPOSE: Evaluates cell-averaged phase velocities for 1D components.
SOURCE file: Gen1DCrunchM.f90
CONTAINed in: Gen1DCrunch
CALLed by: preper

SUBROUTINE: vrbd
PURPOSE: Defines VESSEL velocities in the upstream radial direction for the inner ring (not currently used).
SOURCE file: VessCrunchM.f90
CONTAINed in: VessCrunch
USEs MODULES: VessArray3 VessCon VessTf3dc VessVlt
CALLed by: vssl1

SUBROUTINE: vsgnfpipe
PURPOSE: Calculates the volume for a PIPE.
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
USEs MODULES: PipeVlt
CALLs: sgnfvol1d
CALLed by: sgnfetup

SUBROUTINE: vsgnfplen
PURPOSE: Calculates the volume for a PLENUM.
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf

USEs MODULES: Gen1DArray
CALLed by: sgnfetup

SUBROUTINE: vsgnfprzr
PURPOSE: Calculates the volume for a PRIZER (Pressurizer).
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
USEs MODULES: PrizeVlt
CALLs: sgnfvol1d
CALLed by: sgnfetup

SUBROUTINE: vsgnfpump
PURPOSE: Calculates the volume for a PUMP.
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
USEs MODULES: PumpVlt
CALLs: sgnfvol1d
CALLed by: sgnfetup

SUBROUTINE: vsgnftee
PURPOSE: Calculates the volume for a TEE.
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
USEs MODULES: TeeVlt
CALLs: sgnfvol1d
CALLed by: sgnfetup

SUBROUTINE: vsgnfvlve
PURPOSE: Calculates the volume for a VALVE.
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
USEs MODULES: ValveVlt
CALLs: sgnfvol1d
CALLed by: sgnfetup

SUBROUTINE: vsgnhtstr
PURPOSE: Calculates the volume for an HTSTR.
SOURCE file: DataSgnfM.f90
CONTAINed in: DataSgnf
INCLUDEs files: constant
USEs MODULES: HSArray RodVlt
CALLed by: sgnfetup

SUBROUTINE:	vssl1
PURPOSE:	Performs prepass calculations for VESSEL dynamics.
SOURCE file:	VessTaskM.f90
CONTAINed in:	VessTask
INCLUDEs files:	massck
USEs MODULES:	Bad Boundary Flt GlobalDat GlobalDim GlobalPnt OneDDat SysService Util VectDrag VessArray VessArray3 VessCon VessMat VessStbVel VessTf3dc VessVlt
CALLs:	StbVelx StbVely StbVelz TableTransComp cif3 dvpscl error ifset linint0 prefwd set3dbd setbdt setva timupd vrbd
CALLed by:	prep3d

SUBROUTINE:	vssl2
PURPOSE:	Performs inner iterations for VESSEL dynamics.
SOURCE file:	VessTaskM.f90
CONTAINed in:	VessTask
USEs MODULES:	Bad Bits Boundary CFaces Eos Flt Gen1DArray GenHeat Global GlobalDat GlobalPnt Io Linear Network OneDDat SysService Temp VessArray VessArray3 VessCon VessMat VessTF3DS VessTf3dc VessTo1D VessVlt
CALLs:	Htif3D TableTransComp Therm3D bakup cella3 fluxes set3dbd setbdt tf3ds tf3ds1 tf3ds3 vssssr
CALLed by:	out3d

SUBROUTINE:	vssl3
PURPOSE:	Performs postpass calculations for VESSEL dynamics.
SOURCE file:	VessTaskM.f90
CONTAINed in:	VessTask
INCLUDEs files:	syssum
USEs MODULES:	Bad Bits Boundary CFaces Eos Flt Global GlobalDat GlobalPnt Matrices Network OneDDat RodGlobal SysService VessArray VessArray3 VessCon VessMat VessStbME VessTf3dc VessTo1D VessVlt
CALLs:	Evaldf3D Fprop3D StbME3D Therm3D bakup bkstb3 ff3d gvssl2 mix3d set3dbd
CALLed by:	post3d

SUBROUTINE:	vssrod
PURPOSE:	Transfers data between hydro and HTSTR databases.
SOURCE file:	RodTaskM.f90
CONTAINed in:	RodTask
INCLUDEs files:	htcref3

USEs MODULES:	Flt Global GlobalDat RodHtcref1 VessArray VessArray3 VessCon
CALLed by:	fltom

SUBROUTINE:	vssssr
PURPOSE:	Performs steady-state change ratio calculations for the VESSEL.
SOURCE file:	VessCrunchM.f90
CONTAINed in:	VessCrunch
USEs MODULES:	Flt GlobalDat GlobalPnt RodGlobal VessArray3 VessCon VessTf3dc VessVlt
CALLed by:	vssl2

SUBROUTINE:	warray
PURPOSE:	Writes a real allocated array to output file TRCOUT.
SOURCE file:	TextIoM.f90
CONTAINed in:	TextIo
USEs MODULES:	EngUnits GlobalDim
CALLs:	justlr uncnvt unsvcb wlabr
CALLed by:	elgr input pumpx rbreak rcntl rcomp rdcrvs rebrk recntl refill repipe replen repump rerod1 resepd retee revlve revssl rfill rhtstr rlevel rpipe rplen rpump rrod2 rsepd rtee rvlve rvssl scltbl wrcomp

SUBROUTINE:	wbreak
PURPOSE:	Writes selected BREAK data to output file TRCOUT.
SOURCE file:	BreakM.f90
CONTAINed in:	Break
USEs MODULES:	BreakVlt ControlDat EngUnits Flt GlobalDat GlobalPnt IntrType Io
CALLs:	ecomp uncnvt
CALLed by:	wcomp

SUBROUTINE:	wcomp
PURPOSE:	Controls the writing of selected component data to output file TRCOUT.
SOURCE file:	wcomp.f90
INCLUDEs files:	bignum stncom
USEs MODULES:	Break CompTyp ControlDat EngUnits Fill Flt Global GlobalDat GlobalDim GlobalPnt IntrType Io Pipe Plenum Prizer Pump RodTask Sepd Tee Valve VessTask
CALLs:	uncnvt wbreak wfill whtstr wpipe wplen wprizr wpump wsepd wtee wvlve wvssl
CALLed by:	edit

SUBROUTINE:	wdrag
PURPOSE:	Evaluates coefficient of friction for liquid and vapor at the wall.

SOURCE file: wdrag.f90
USEs MODULES: IntrType
CALLed by: vfwall3

SUBROUTINE: wfill
PURPOSE: Writes selected FILL data to output file TRCOUT.
SOURCE file: FillM.f90
CONTAINed in: Fill
USEs MODULES: EngUnits FillVlt Flt IntrType Io
CALLs: ecomp uncnvt
CALLed by: wcomp

SUBROUTINE: whtstr
PURPOSE: Writes selected HTSTR data to output file TRCOUT.
SOURCE file: RodTaskM.f90
CONTAINed in: RodTask
INCLUDEs files: bignum
USEs MODULES: CompTyp EngUnits Eos Flt Global GlobalDat GlobalPnt Io RodVlt
CALLs: uncnvt uncnvts
CALLed by: wcomp

SUBROUTINE: wiarn
PURPOSE: Writes an allocated integer array to output file TRCOUT.
SOURCE file: TextIoM.f90
CONTAINed in: TextIo
CALLs: justlr wlabin
CALLed by: rcomp replen rerod1 revssl rhtstr rplen rvssl wrcomp

SUBROUTINE: wir
PURPOSE: Writes one to five real or integer variable values to a character string.
SOURCE file: ReadEchoM.f90
CONTAINed in: ReadEcho
USEs MODULES: BadInput Io
CALLs: error
CALLed by: readr reecho

SUBROUTINE: wlabi
PURPOSE: Edits labeled integer-valued input data that are to be read by the load subroutine using undimensioned arrays.
SOURCE file: TextIoM.f90
CONTAINed in: TextIo
USEs MODULES: Io

CALLed by: input

SUBROUTINE: wlabin
PURPOSE: Edits labeled integer-valued input data that are to be read by the load subroutine using allocated arrays.
SOURCE file: TextIoM.f90
CONTAINed in: TextIo
USEs MODULES: IntrType Io
CALLed by: rcntl wiarn

SUBROUTINE: wlabr
PURPOSE: Edits labeled real-valued input data that are to be read by the load subroutine using undimensioned arrays.
SOURCE file: TextIoM.f90
CONTAINed in: TextIo
USEs MODULES: IntrType Io
CALLed by: warray wmxytb

SUBROUTINE: wlabrn
PURPOSE: Edits labeled real-valued input data that are to be read by the load subroutine using allocated arrays.
SOURCE file: TextIoM.f90
CONTAINed in: TextIo
USEs MODULES: IntrType Io
CALLed by: rrod2

SUBROUTINE: wlevel
PURPOSE: Writes real VESSEL level array to output file TRCOUT.
SOURCE file: VessTaskM.f90
CONTAINed in: VessTask
USEs MODULES: EngUnits Io VessArray VessCon
CALLs: leveli uncnvt
CALLed by: ivssl wvssl

SUBROUTINE: wmxytb
PURPOSE: Converts the units of input-array tabular data with one to four independent variable parameters for output to the INLAB or TRCOUT files and to SI units for the TRAC calculation using allocated arrays.
SOURCE file: TextIoM.f90
CONTAINed in: TextIo
USEs MODULES: EngUnits GlobalDim Io
CALLs: justlr uncnvt wlabr

CALLed by:	rcntl recntl repipe repump rerod1 resepd retee revlve rpipe rpump rrod2 rsepd rtee rvlve scltbl

SUBROUTINE:	wpipe
PURPOSE:	Writes selected PIPE data to output file TRCOUT.
SOURCE file:	PipeM.f90
CONTAINed in:	Pipe
USEs MODULES:	EngUnits Flt GlobalDat IntrType Io PipeVlt
CALLs:	ecomp uncnvt
CALLed by:	wcomp

SUBROUTINE:	wplen
PURPOSE:	Writes selected PLENUM quantities to the output file TRCOUT.
SOURCE file:	PlenumM.f90
CONTAINed in:	Plenum
USEs MODULES:	Boundary EngUnits Flt Gen1DArray PlenVlt
CALLs:	uncnvt
CALLed by:	wcomp

SUBROUTINE:	wprizr
PURPOSE:	Writes selected PRIZER (Pressurizer) data to output file TRCOUT.
SOURCE file:	PrizerM.f90
CONTAINed in:	Prizer
USEs MODULES:	EngUnits Flt GlobalDat Io PrizeVlt
CALLs:	ecomp uncnvt
CALLed by:	wcomp

SUBROUTINE:	wpump
PURPOSE:	Writes selected PUMP data to output file TRCOUT.
SOURCE file:	PumpM.f90
CONTAINed in:	Pump
USEs MODULES:	Control EngUnits Flt GlobalDat IntrType Io PumpVlt
CALLs:	ecomp trip uncnvt
CALLed by:	wcomp

SUBROUTINE:	wrcomp
PURPOSE:	Writes data common to 1D components to output files.
SOURCE file:	wrcomp.f90
USEs MODULES:	Flt Gen1DArray Global GlobalDat IntArray IntrType TextIo
CALLs:	warray wiarn
CALLed by:	repipe reprzr repump resepd retee revlve

SUBROUTINE:	wsepd
PURPOSE:	Writes selected SEPD (Separator) data to output file TRCOUT.
SOURCE file:	SepdM.f90
CONTAINed in:	Sepd
USEs MODULES:	EngUnits Io
CALLs:	ecomp uncnvt
CALLed by:	wcomp

SUBROUTINE:	wtee
PURPOSE:	Writes selected TEE data to output file TRCOUT.
SOURCE file:	TeeM.f90
CONTAINed in:	Tee
USEs MODULES:	CompTyp EngUnits Flt GlobalDat IntrType Io TeeVlt
CALLs:	ecomp uncnvt
CALLed by:	wcomp

SUBROUTINE:	wvlve
PURPOSE:	Writes selected VALVE data to output file TRCOUT.
SOURCE file:	ValveM.f90
CONTAINed in:	Valve
USEs MODULES:	EngUnits Flt Gen1DArray GlobalDat IntrType Io ValveVlt
CALLs:	ecomp uncnvt
CALLed by:	wcomp

SUBROUTINE:	wvssl
PURPOSE:	Writes selected VESSEL data to output file TRCOUT.
SOURCE file:	VessTaskM.f90
CONTAINed in:	VessTask
USEs MODULES:	EngUnits Flt GlobalDat GlobalDim Io VessArray VessArray3 VessCon VessTf3dc VessVlt
CALLs:	uncnvt wlevel
CALLed by:	wcomp

SUBROUTINE:	xtv1d
PURPOSE:	Writes index and data for generic variables of 1D components for XTV graphics.
SOURCE file:	XtvM.f90
CONTAINed in:	Xtv
USEs MODULES:	Flt Gen1DArray IntArray
CALLs:	LuMatch PrintVarDesc WriteSim2DArray WriteStSumV1 WriteStaticV1 WriteValAsArray WriteValAsSArray cxtvxgd1a cxtvxgd1b cxtvxgd1c cxtvxvcnt xtvbuf1 xtvbufs

CALLed by: xtvpipe xtvprzr xtvpump xtvtee xtvvalv

SUBROUTINE: xtvGnPr
PURPOSE: Loads and dumps general pointer information to the graphics files.
SOURCE file: XtvM.f90
CONTAINed in: Xtv
USEs MODULES: GlobalDat SysTime
CALLs: PrintVarDesc cxtvxgnpr cxtvxvcnt xtvbufs

SUBROUTINE: xtvbi3e
PURPOSE: Converts values to IEEE format under UNICOS for XTV graphics.
SOURCE file: XtvM.f90
CONTAINed in: Xtv
CALLs: cxtvbw1 cxtvxdata
CALLed by: xtvbuf1 xtvbuf1o xtvbuf3

SUBROUTINE: xtvbrak
PURPOSE: Writes BREAK graphics files.
SOURCE file: XtvM.f90
CONTAINed in: Xtv
USEs MODULES: BreakArray BreakVlt Flt Gen1DArray
CALLs: LuMatch PrintVarDesc WriteStaticV1 cxtvxbrak cxtvxvcnt xtvbuf1 xtvbufs
CALLed by: xtvdr

SUBROUTINE: xtvbuf1
PURPOSE: Buffers data to be sent to a C binary write routine and converts to IEEE format under UNICOS for XTV graphics using 1D allocated arrays.
SOURCE file: XtvM.f90
CONTAINed in: Xtv
CALLs: xtvbi3e
CALLed by: xtv1d xtvbrak xtvfill xtvht xtvplen

SUBROUTINE: xtvbuf1o
PURPOSE: Buffers data to be sent to a C binary write routine and converts to IEEE format under UNICOS for XTV graphics using 1D undimensioned arrays.
SOURCE file: XtvM.f90
CONTAINed in: Xtv
CALLs: xtvbi3e
CALLed by: xtvbufs

SUBROUTINE:	xtvbuf3
PURPOSE:	Buffers data to be sent to a C binary write routine and converts to IEEE format under UNICOS for XTV graphics using 3D allocated arrays.
SOURCE file:	XtvM.f90
CONTAINed in:	Xtv
CALLs:	xtvbi3e
CALLed by:	xtvvsl

SUBROUTINE:	xtvbufs
PURPOSE:	Buffers data to be sent to a C binary write routine and converts to IEEE format under UNICOS for XTV graphics for scalar data.
SOURCE file:	XtvM.f90
CONTAINed in:	Xtv
CALLs:	xtvbuf1o
CALLed by:	xtv1d xtvGnPr xtvbrak xtvcntl xtvdr xtvfill xtvht xtvpipe xtvprzr xtvpump xtvtee xtvvalv xtvvsl

SUBROUTINE:	xtvcntl
PURPOSE:	Writes index and data for control-block output-parameter values for XTV graphics.
SOURCE file:	XtvM.f90
CONTAINed in:	Xtv
CALLs:	PrintVarDesc cxtvxcntl cxtvxvcnt xtvbufs
CALLed by:	xtvdr

SUBROUTINE:	xtvdr
PURPOSE:	Main xtv driver routine that calls appropriate component-specific routine to perform a function.
SOURCE file:	XtvM.f90
CONTAINed in:	Xtv
USEs MODULES:	Flt
CALLs:	cxtvcl cxtvoa1 cxtvxarrupd cxtvxdatainit cxtvxupdcnts xtvbrak xtvbufs xtvcntl xtvfill xtvgnpr xtvht xtvpipe xtvplen xtvprzr xtvpump xtvtee xtvvalv xtvvsl
CALLed by:	init pstepq steady trans

SUBROUTINE:	xtvfill
PURPOSE:	Writes FILL graphics files.
SOURCE file:	XtvM.f90
CONTAINed in:	Xtv
USEs MODULES:	FillArray FillVlt Flt Gen1DArray

CALLs:	LuMatch PrintVarDesc WriteStaticV1 cxtvxfill cxtvxvcnt xtvbuf1 xtvbufs
CALLed by:	xtvdr
SUBROUTINE:	xtvht
PURPOSE:	Writes index and data for HTSTR-component variables for XTV graphics.
SOURCE file:	XtvM.f90
CONTAINed in:	Xtv
INCLUDEs files:	bignum
USEs MODULES:	Flt HSArray RodVlt
CALLs:	PrintVarDesc cxtvxhtr1 cxtvxhtr3 cxtvxhtr4 cxtvxhtr5 cxtvxhtr6 cxtvxhts1 cxtvxhts2 cxtvxvcnt xtvbuf1 xtvbufs
CALLed by:	xtvdr
SUBROUTINE:	xtvinit
PURPOSE:	Defines names for all output variables, opens header file, and calls `cxtvtin` to set the maximum datafile size for XTV graphics.
SOURCE file:	XtvM.f90
CONTAINed in:	Xtv
CALLs:	GetLocalSysInfo LuMatch cxtvin cxtvxopn cxtvxstart error
CALLed by:	init
SUBROUTINE:	xtvpipe
PURPOSE:	Writes index and data for PIPE variables and calls `xtv1d` for generic 1D variables for XTV graphics.
SOURCE file:	XtvM.f90
CONTAINed in:	Xtv
USEs MODULES:	Flt Gen1DArray IntArray PipeVlt
CALLs:	PrintVarDesc xtv1d xtvbufs
CALLed by:	xtvdr
SUBROUTINE:	xtvplen
PURPOSE:	Writes index and data for PLENUM variables for XTV graphics.
SOURCE file:	XtvM.f90
CONTAINed in:	Xtv
USEs MODULES:	Flt Gen1DArray PlenArray PlenVlt
CALLs:	LuMatch PrintVarDesc WriteStaticV1 cxtvxpln1 cxtvxpln2 cxtvxpln3 cxtvxvcnt xtvbuf1
CALLed by:	xtvdr
SUBROUTINE:	xtvprzr

PURPOSE:	Writes index and data for PRESSURIZER variables and calls `xtv1d` for generic 1D variables for XTV graphics.
SOURCE file:	XtvM.f90
CONTAINed in:	Xtv
USEs MODULES:	Flt Gen1DArray IntArray PrizeVlt
CALLs:	PrintVarDesc xtv1d xtvbufs
CALLed by:	xtvdr

SUBROUTINE:	xtvpump
PURPOSE:	Writes index and data for PUMP variables and calls `xtv1d` for generic 1D variables for XTV graphics.
SOURCE file:	XtvM.f90
CONTAINed in:	Xtv
USEs MODULES:	Flt Gen1DArray IntArray PumpVlt
CALLs:	PrintVarDesc xtv1d xtvbufs
CALLed by:	xtvdr

SUBROUTINE:	xtvtee
PURPOSE:	Writes index and data for TEE variables and calls `xtv1d` for generic 1D variables for XTV graphics.
SOURCE file:	XtvM.f90
CONTAINed in:	Xtv
USEs MODULES:	Flt Gen1DArray IntArray TeeVlt
CALLs:	PrintVarDesc xtv1d xtvbufs
CALLed by:	xtvdr

SUBROUTINE:	xtvvalv
PURPOSE:	Writes index and data for VALVE variables and calls `xtv1d` for generic 1D variables for XTV graphics.
SOURCE file:	XtvM.f90
CONTAINed in:	Xtv
USEs MODULES:	Flt Gen1DArray IntArray ValveVlt
CALLs:	PrintVarDesc xtv1d xtvbufs
CALLed by:	xtvdr

SUBROUTINE:	xtvvsl
PURPOSE:	Writes index and data for VESSEL variables for XTV graphics.
SOURCE file:	XtvM.f90
CONTAINed in:	Xtv
USEs MODULES:	Flt VessArray VessArray3 VessVlt
CALLs:	LuMatch PrintVarDesc WriteStaticV3 cxtvxvcnt cxtvxvsl1 cxtvxvsl2 cxtvxvsl3 xtvbuf3 xtvbufs
CALLed by:	xtvdr

SUBROUTINE: zcore
PURPOSE: Evaluates axial locations for CHF and transition boiling within the core and computes associated void fractions.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
INCLUDEs files: diddlh htcref2 refhti refhti2
USEs MODULES: VessCon
CALLed by: core1

SUBROUTINE: zerov
PURPOSE: Zeroes velocities at zero flow areas.
SOURCE file: VessTF3DSM.f90
CONTAINed in: VessTF3DS
USEs MODULES: VessArray3 VessCon VessVlt
CALLed by: tf3ds1

SUBROUTINE: zpwhci
PURPOSE: Evaluates axial power shape based on user input.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
CALLed by: core1 irod

SUBROUTINE: zpwnrm
PURPOSE: Normalizes the 1D or 2D axial-power distribution to a spatially averaged value of unity.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
USEs MODULES: CompTyp
CALLed by: core1 rrod2

SUBROUTINE: zpwrci
PURPOSE: Interpolates the r- or x-direction power shapes from `zpwf` at the axial locations of the node rows.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
USEs MODULES: CompTyp
CALLs: error
CALLed by: core1 irod

B.6. FUNCTIONs

FUNCTION:	Adj1DEdge
PURPOSE:	Given an input integer index to a `junCells` element, returns the system variable index corresponding to the face on the opposite side of that junction cell (one face into the same 1D mesh segment).
Source file:	SysConfigM.f90
CONTAINed in:	SysConfig

FUNCTION:	Adj3DEdge
PURPOSE:	Given an input integer index to a `junCells` element, returns the system variable index corresponding to the face opposite the connection within the 3D mesh segment for `junCells(i)%compnum`. This function assumes a logically rectangular structure to the 3D mesh.
SOURCE file:	SysConfigM.f90
CONTAINed in:	SysConfig
USEs MODULES:	VessVlt

FUNCTION:	AreContigC
PURPOSE:	Checks to see if volumes indexed `iv1` and `iv2` are immediately contiguous on the 1D mesh. This requires that the connection from at least one cell is via a mesh face within or at one of the two ends of a 1D mesh.
Source file:	SetMatM.f90
CONTAINed in:	SetMat

FUNCTION:	AreContigE
PURPOSE:	Checks to see if cell edges indexed `ie1` and `ie2` are immediately contiguous on the 1D mesh.
Source file:	SetMatM.f90
CONTAINed in:	SetMat

FUNCTION:	GetEosDriv1d
PURPOSE:	Returns a scalar equation of state derivative from the inverted container array `driv`.
SOURCE file:	Gen1DArrayM.f90
CONTAINed in:	Gen1DArray
USEs MODULES:	Global

FUNCTION:	GetGen1D
PURPOSE:	Returns the pointer for a generic 1D-component array.
SOURCE file:	Gen1DArrayM.f90
CONTAINed in:	Gen1DArray

CALLs: Get1DArrayPointer

FUNCTION: GetGen1D2D
PURPOSE: Returns the pointer for a generic 1D-component, 2D array.
SOURCE file: Gen1DArrayM.f90
CONTAINed in: Gen1DArray
CALLs: Get2DArrayPointer

FUNCTION: GetHS
PURPOSE: Returns the pointer for a 1D HTSTR-component array.
SOURCE file: HSArrayM.f90
CONTAINed in: HSArray
CALLs: GetHS1DPtr

FUNCTION: GetHS2d
PURPOSE: Returns the pointer for a 2D HTSTR-component array.
SOURCE file: HSArrayM.f90
CONTAINed in: HSArray
CALLs: GetHS2DPtr

FUNCTION: GetHS3d
PURPOSE: Returns the pointer for a 3D HTSTR-component array.
SOURCE file: HSArrayM.f90
CONTAINed in: HSArray
CALLs: GetHS3DPtr

FUNCTION: GetHSSurf
PURPOSE: Returns the pointer for a 3D HTSTR surface.
SOURCE file: HSArrayM.f90
CONTAINed in: HSArray
CALLs: GetHS3DPtr

FUNCTION: GetNoht
PURPOSE: Returns the pointer for an unheated ROD array.
SOURCE file: HSArrayM.f90
CONTAINed in: HSArray
USEs MODULES: Global

FUNCTION: GetSysTime
PURPOSE: Returns the current system time.
SOURCE file: SysTimeM.f90
CONTAINed in: SysTime

CALLs: SYSTEM_CLOCK

FUNCTION: GetVSAR
PURPOSE: Returns pointer values for the 3D VESSEL component.
SOURCE file: VessArray3M.f90
CONTAINed in: VessArray3

FUNCTION: IndAob
PURPOSE: Given a sparce matrix row index and a system variable index, returns the index in `aIndE(irow)%aob` containing the value `ivar`. (This function should be removed once a general junction treatment for momentum transfer is installed.)
SOURCE file: Gen1DCrunchM.f90
CONTAINed in: Gen1DCrunch

FUNCTION: InteriorJunNum
PURPOSE: Creates a unique negative integer for use as a junction number for interior (e.g., TEE primary to secondary) component junctions. This relies on the module variable `intJunNum` to act as source of unique (and sequential) negative numbers.
SOURCE file: SysConfigM.f90
CONTAINed in: SysConfig

FUNCTION: JunCellsIndex
PURPOSE: Given an input junction number `jun` and adjacent cell number `icell`, searches the component with index `ijcmp` to find the index in `junCells` giving information on the cell adjacent to that junction. (Returns an INTEGER value.)
Source file: SysConfigM.f90
CONTAINed in: SysConfig

FUNCTION: SDOTT
PURPOSE: Computes single-precision inner product of single-precision vectors.
SOURCE file: LinearM.f90
CONTAINed in: Linear

FUNCTION: allblk
PURPOSE: Tests for all blanks in specified substring of string.
SOURCE file: PreInputM.f90
CONTAINed in: PreInput

FUNCTION: btestc
PURPOSE: C implementation of the Fortran 90 `btest` bit intrinsic function.

SOURCE file: CFacesM.f90
CONTAINed in: CFaces

FUNCTION: cdthex
PURPOSE: Evaluates the diametral thermal expansion of Zircaloy as a function of temperature.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch
USEs MODULES: Util
CALLs: linint0

FUNCTION: cepsilon
PURPOSE: C implementation of the Fortran 90 epsilon intrinsic function.
SOURCE file: CFacesM.f90
CONTAINed in: CFaces

FUNCTION: concf
PURPOSE: Returns maximum solubility (kg solute/kg water) for species `ispec` at pressure p and water temperature tl.
SOURCE file: UtilM.f90
CONTAINed in: Util
INCLUDEs files: solcon

FUNCTION: courno
PURPOSE: Defines the maximum material Courant number for the VESSEL component.
SOURCE file: UtilM.f90
CONTAINed in: Util
USEs MODULES: GlobalDat

FUNCTION: cpll
PURPOSE: Determines the specific heat of D2O or H2O liquid as a function of enthalpy and pressure by calling `cplld` or `cpllh`.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline

FUNCTION: cplld
PURPOSE: Evaluates the specific heat of D2O liquid as a function of enthalpy and pressure.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline

FUNCTION: cpllh

PURPOSE: Evaluates the specific heat of H2O liquid as a function of enthalpy and pressure.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline

FUNCTION: cpvv1
PURPOSE: Determines the specific heat of D2O or H2O vapor as a function of temperature and pressure by calling `cpvv1d` or `cpvv1h`.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline

FUNCTION: cpvv1d
PURPOSE: Evaluates the specific heat of D2O vapor as a function of temperature and pressure.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline
USEs MODULES: GlobalDat

FUNCTION: cpvv1h
PURPOSE: Evaluates the specific heat of H2O vapor as a function of temperature and pressure.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline
USEs MODULES: GlobalDat

FUNCTION: ddot
PURPOSE: Forms the dot product of two vectors.
SOURCE file: LinearM.f90
CONTAINed in: Linear

FUNCTION: fthex
PURPOSE: Evaluates the fuel linear thermal-expansion coefficient for uranium dioxide and MOX fuels.
SOURCE file: RodCrunchM.f90
CONTAINed in: RodCrunch

FUNCTION: gettype
PURPOSE: Returns component name (e.g., PIPE) from component-type number (e.g., 1.0).
SOURCE file: CompTypM.f90
CONTAINed in: CompTyp

FUNCTION: hev

PURPOSE: Determines the heat of evaporation of D2O or H2O liquid corresponding to a given temperature at low pressure.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline

FUNCTION: hevd
PURPOSE: Evaluates the heat of evaporation of D2O liquid corresponding to a given temperature at low pressure.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline

FUNCTION: hevh
PURPOSE: Evaluates the heat of evaporation of H2O liquid corresponding to a given temperature at low pressure.
SOURCE file: EosInlineM.f90
CONTAINed in: EosInline

FUNCTION: hunts
PURPOSE: Searches character string for specified search string.
SOURCE file: PreInputM.f90
CONTAINed in: PreInput

FUNCTION: ibclrc
PURPOSE: C implementation of the Fortran 90 `ibclr` bit intrinsic function.
SOURCE file: CFacesM.f90
CONTAINed in: CFaces

FUNCTION: ibsetc
PURPOSE: C implementation of the Fortran 90 `ibset` bit intrinsic function.
SOURCE file: CFacesM.f90
CONTAINed in: CFaces

FUNCTION: idamax
PURPOSE: Finds the index of the element having the maximum absolute value.
SOURCE file: LinearM.f90
CONTAINed in: Linear

FUNCTION: idel
PURPOSE: Searches specified substring of string for any one character in a set of specified characters.
SOURCE file: PreInputM.f90
CONTAINed in: PreInput

FUNCTION:	indel
PURPOSE:	Searches specified substring of string for first nonoccurrence of any one character in a set of specified characters.
SOURCE file:	PreInputM.f90
CONTAINed in:	PreInput

FUNCTION:	jfind
PURPOSE:	Locates junctions in junction sequence array.
SOURCE file:	UtilM.f90
CONTAINed in:	Util
USEs MODULES:	IntrType
CALLs:	error

FUNCTION:	jvalue
PURPOSE:	Converts one character of a string to a binary number: 0–9 returned as binary mode; blank, as binary 0; all others, as less than 0.
SOURCE file:	UtilM.f90
CONTAINed in:	Util

FUNCTION:	ltopp
PURPOSE:	Determines if velocities at opposite faces of a TEE-component JCELL are both directed into the JCELL.
SOURCE file:	UtilM.f90
CONTAINed in:	Util
CALLs:	error

FUNCTION:	numtoicomp
PURPOSE:	Returns the ordered component index of the input component number.
SOURCE file:	UtilM.f90
CONTAINed in:	Util
USEs MODULES:	Global GlobalPnt

FUNCTION:	rttr
PURPOSE:	Determines coefficient for momentum convection across the TEE internal junction.
SOURCE file:	UtilM.f90
CONTAINed in:	Util
USEs MODULES:	OneDDat
CALLs:	error

FUNCTION:	sasumt
PURPOSE:	Evaluates the sum of the magnitues of vector elements.

SOURCE file: LinearM.f90
CONTAINed in: Linear

FUNCTION: satded
PURPOSE: Evaluates the derivative of the saturation temperature with respect to pressure for D2O vapor.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline

FUNCTION: satdeh
PURPOSE: Evaluates the derivative of the saturation temperature with respect to pressure for H2O vapor.
SOURCE file: EosInlineM.f90
CONTAINed in: EosInline

FUNCTION: satder
PURPOSE: Determines the derivative of the saturation temperature with respect to pressure for D2O or H2O vapor by calling `satded` or `satdeh`.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline

FUNCTION: satprd
PURPOSE: Evaluates the saturation pressure of D2O vapor at a given vapor temperature.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline

FUNCTION: satprh
PURPOSE: Evaluates the saturation pressure of H2O vapor at a given vapor temperature.
SOURCE file: EosInlineM.f90
CONTAINed in: EosInline

FUNCTION: satprs
PURPOSE: Determines the saturation pressure of D2O or H2O vapor at a given temperature by calling `satprd` or `satprh`.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline

FUNCTION: sattmd
PURPOSE: Evaluates the saturation temperature of D2O vapor at a given pressure.
SOURCE file: EosNoInlineM.f90

CONTAINed in: EosNoInline

FUNCTION: sattmh
PURPOSE: Evaluates the saturation temperature of H2O vapor at a given pressure.
SOURCE file: EosInlineM.f90
CONTAINed in: EosInline

FUNCTION: sattmp
PURPOSE: Determines the saturation temperature of D2O or H2O vapor at a given pressure by calling `sattmd` or `sattmh`.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline

FUNCTION: sigma
PURPOSE: Returns surface tension of water as a function of pressure.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline

FUNCTION: teemet
PURPOSE: Evaluates the explicit third term of TEE internal-junction momentum convection.
SOURCE file: UtilM.f90
CONTAINed in: Util
USEs MODULES: OneDDat
CALLs: error

FUNCTION: teemf1
PURPOSE: Evaluates the coefficient of the implicit first term of TEE internal-junction momentum convection.
SOURCE file: UtilM.f90
CONTAINed in: Util
USEs MODULES: OneDDat
CALLs: error

FUNCTION: teemf2
PURPOSE: Evaluates the coefficient of the implicit second term of TEE internal-junction momentum convection.
SOURCE file: UtilM.f90
CONTAINed in: Util

FUNCTION: teemom

PURPOSE: Evaluates the TEE internal-junction three momentum-convection terms by calling `teemet`, `teemf1`, and `teemf2`.
SOURCE file: UtilM.f90
CONTAINed in: Util
CALLs: error

FUNCTION: thcl
PURPOSE: Determines the thermal conductivity of D2O or H2O as a function of pressure and enthalpy by calling `thcld` or `thclh`.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline

FUNCTION: thcld
PURPOSE: Evaluates the thermal conductivity of D2O as a function of pressure and enthalpy.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline

FUNCTION: thclh
PURPOSE: Evaluates the thermal conductivity of H2O as a function of pressure and enthalpy.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline

FUNCTION: thcv
PURPOSE: Evaluates thermal conductivity of steam as a function of pressure and enthalpy.
SOURCE file: EosNoInlineM.f90
CONTAINed in: EosNoInline
USEs MODULES: GlobalDat

FUNCTION: tofric
PURPOSE: Returns the value of tofric for the SEPARATOR component.
SOURCE file: SepdM.f90
CONTAINed in: Sepd

FUNCTION: tokfac
PURPOSE: Returns the value of `tokfac` for the SEPARATOR component.
SOURCE file: SepdM.f90
CONTAINed in: Sepd

FUNCTION: viscl

PURPOSE:	Determines the viscosity of D2O or H2O liquid as a function of pressure and enthalpy by calling `viscld` or `viscl h`.
SOURCE file:	EosNoInlineM.f90
CONTAINed in:	EosNoInline

FUNCTION:	viscld
PURPOSE:	Evaluates the viscosity of D2O liquid as a function of pressure and enthalpy.
SOURCE file:	EosNoInlineM.f90
CONTAINed in:	EosNoInline

FUNCTION:	visclh
PURPOSE:	Evaluates the viscosity of H2O liquid as a function of pressure and enthalpy.
SOURCE file:	EosNoInlineM.f90
CONTAINed in:	EosNoInline

FUNCTION:	viscv
PURPOSE:	Determines the viscosity of D2O or H2O vapor as a function of pressure and enthalpy by calling `viscvd` or `viscvh`.
SOURCE file:	EosNoInlineM.f90
CONTAINed in:	EosNoInline

FUNCTION:	viscvd
PURPOSE:	Evaluates the viscosity of D2O vapor as a function of pressure and enthalpy.
SOURCE file:	EosNoInlineM.f90
CONTAINed in:	EosNoInline
USEs MODULES:	GlobalDat

FUNCTION:	viscvh
PURPOSE:	Evaluates the viscosity of H2O vapor as a function of pressure and enthalpy.
SOURCE file:	EosNoInlineM.f90
CONTAINed in:	EosNoInline
USEs MODULES:	GlobalDat

FUNCTION:	wjcell
PURPOSE:	Evaluates the `jcell` width seen by the adjacent side-channel cell from which the pressure gradient across the internal junction is defined.
SOURCE file:	TeeM.f90
CONTAINed in:	Tee

B.7. BLOCK DATAs

BLOCK DATA: blkdat
PURPOSE: Defines block data.
Source file: blkdat.f90
INCLUDEs files: bandw cflow chfint chgalp ciflim cnrslv constant decayc defval diddle diddlh diddli dlimit dtinfo elvkf film h2fdbk htcav htcref3 htcs ifcrs junction refhti refhti2 rows solcon stncom strtnt tst3d vckdat vdvmod webnum
CALLed by: trac

B.8. INCLUDE files

INCLUDE: bandw
PURPOSE: Defines common block `bandw`.
Source file: bandw.h
INCLUDEd by: blkdat ivssl out3d post3d prep3d

INCLUDE: bignum
PURPOSE: Contains data statements to initialize the arrays used to display the TRAC-M big numbers.
Source file: bignum.h
INCLUDEd by: input rdrest wcomp whtstr xtvht

INCLUDE: boil
PURPOSE: Defines common block `boil`.
Source file: boil.h
INCLUDEd by: tf3ds

INCLUDE: cflow
PURPOSE: Defines common block `cflow`.
Source file: cflow.h
INCLUDEd by: StbVel1D blkdat choke input namlst rcomp rsepd rtee tf1ds1

INCLUDE: chfint
PURPOSE: Defines common block `chfint`.
Source file: chfint.h
INCLUDEd by: blkdat chf1 htcor htvssl

INCLUDE: chgalp
PURPOSE: Defines common block `chgalp`.

Source file: chgalp.h
INCLUDEd by: bkstb3 blkdat dmpit newdlt plen3 post poster rdrest

INCLUDE: ciflim
PURPOSE: Defines common block `ciflim`.
Source file: ciflim.h
INCLUDEd by: StbVel1D blkdat cif3

INCLUDE: cnrslv
PURPOSE: Defines common block `cnrslv`.
Source file: cnrslv.h
INCLUDEd by: bansol blkdat htstr3 input namlst rodht

INCLUDE: concck
PURPOSE: Defines common block `concck`.
Source file: concck.h
INCLUDEd by: input rcomp

INCLUDE: condht
PURPOSE: Defines common block `condht`.
Source file: condht.h
INCLUDEd by: core1 htcor htpipe htvssl

INCLUDE: constant
PURPOSE: Defines common block `constant`.
Source file: constant.h
INCLUDEd by: StbVel1D StbVelz blkdat breakx chen chf1 choke cif3 compi core1 cylht fillx fwall hlfilm hlflmr htcor htif htpipe htstrp htvssl hvfilm hvnb ibrk ifill input iplen iprizr irod itee linint mwrx offtke poster powint prefwd pumpd pumpsr pumpx resepd retee revssl rhtstr rodht rsepd rtee rvssl sepdi sepdx sgnhtstr svset1 tee3 tf1ds1 tf3ds1 timstp vsgnhtstr

INCLUDE: decayc
PURPOSE: Defines common block `decayc`.
Source file: decayc.h
INCLUDEd by: blkdat decays dhtstr rehtst rhtstr rkin rrod1 rrod2

INCLUDE: defval
PURPOSE: Defines common block `defval`.
Source file: defval.h
INCLUDEd by: blkdat input loadn loado namlst rcomp rplen rvssl

INCLUDE: diddle
PURPOSE: Defines common block `diddle`.
Source file: diddle.h
INCLUDEd by: StbVel1D StbVelx StbVely blkdat cella3 cellav cif3 htif plen2 prefwd tf1ds tf3ds tfpln

INCLUDE: diddlh
PURPOSE: Defines common block `diddlh`.
Source file: diddlh.h
INCLUDEd by: blkdat chf1 cif3 core1 hlfilm hlflmr htcor htif htpipe htvssl input namlst steady tf1ds trans zcore

INCLUDE: diddli
PURPOSE: Defines common block `diddli`.
Source file: diddli.h
INCLUDEd by: blkdat tf1ds tf3ds

INCLUDE: dlimit
PURPOSE: Defines common block `dlimit`.
Source file: dlimit.h
INCLUDEd by: blkdat dmpit hout newdlt prep1d rdrest rkin sedit timstp vlvex

INCLUDE: dtinfo
PURPOSE: Defines common block `dtinfo`.
Source file: dtinfo.h
INCLUDEd by: bkstb3 blkdat newdlt plen3 poster tf1ds1 trpset

INCLUDE: elvkf
PURPOSE: Defines common block `elvkf`.
Source file: elvkf.h
INCLUDEd by: blkdat chkbd civssl core1 dmpit elgr ibrk icomp ifill input ipipe iplen iprizr ipump itee ivlve iwall3 namlst rbreak rcomp rdrest rhtstr rpump rvssl

INCLUDE: film
PURPOSE: Defines common block film.
Source file: film.h
INCLUDEd by: blkdat cif3 core1 htif prefwd

INCLUDE: h2fdbk
PURPOSE: Defines common block h2fdbk.
Source file: h2fdbk.h
INCLUDEd by: blkdat input

INCLUDE: htcav
PURPOSE: Defines common block `htcav`.
Source file: htcav.h
INCLUDEd by: blkdat htcor htvssl

INCLUDE: htcref2
PURPOSE: Defines common block `htcref2`.
Source file: htcref2.h
INCLUDEd by: core1 zcore

INCLUDE: htcref3
PURPOSE: Defines common block `htcref3`.
Source file: htcref3.h
INCLUDEd by: blkdat core1 htif htstr1 htvssl vssrod

INCLUDE: htcs
PURPOSE: Defines common block `htcs`.
Source file: htcs.h
INCLUDEd by: blkdat htcor htvssl input namlst rhtstr

INCLUDE: ifcrs
PURPOSE: Defines common block `ifcrs`.
Source file: ifcrs.h
INCLUDEd by: StbVel1D blkdat cif3 core1 htif htvssl ivssl rhtstr rodht

INCLUDE: infohl
PURPOSE: Defines common block `infohl`.
Source file: infohl.h
INCLUDEd by: hlflmr htvssl

INCLUDE: junction
PURPOSE: Defines common block `junction`.
Source file: junction.h
INCLUDEd by: blkdat icomp input rbreak rebrk refill repipe replen reprzr repump resepd retee revlve revssl rfill rpipe rplen rprizr rpump rsepd rtee rvlve rvssl srtlp

INCLUDE: massck
PURPOSE: Defines common block `massck`.
Source file: massck.h
INCLUDEd by: dmpit flux input rdrest steady trans vssl1

INCLUDE: nrcmp
PURPOSE: Defines common block `nrcmp`.
Source file: nrcmp.h
INCLUDEd by: input rdrest

INCLUDE: refhti
PURPOSE: Defines common block `refhti`.
Source file: refhti.h
INCLUDEd by: blkdat core1 hlflmr htif htvssl zcore

INCLUDE: refhti2
PURPOSE: Defines common block `refhti2`.
Source file: refhti2.h
INCLUDEd by: blkdat cif3 core1 hlflmr htif htvssl prefwd zcore

INCLUDE: rows
PURPOSE: Defines common block `rows`.
Source file: rows.h
INCLUDEd by: blkdat input tf1ds tfpln

INCLUDE: solcon
PURPOSE: Defines common block `solcon`.
Source file: solcon.h
INCLUDEd by: blkdat concf input

INCLUDE: stncom
PURPOSE: Defines common block `stncom`.
Source file: stncom.h
INCLUDEd by: blkdat core1 wcomp

INCLUDE: strtnt
PURPOSE: Defines common block `strtnt`.
Source file: strtnt.h
INCLUDEd by: StbVel1D blkdat cella3

INCLUDE: supres
PURPOSE: Defines common block `supres`.
Source file: supres.h
INCLUDEd by: chen htcor htvssl

INCLUDE: syssum
PURPOSE: Defines common block `syssum`.

Source file: syssum.h
INCLUDEd by: bksstb bkstb3 gvssl1 hout post prizr3 vssl3

INCLUDE: totals
PURPOSE: Defines common block `totals`.
Source file: totals.h
INCLUDEd by: rcomp rpipe rsepd rtee

INCLUDE: tst3d
PURPOSE: Defines common block `tst3d`.
Source file: tst3d.h
INCLUDEd by: StbVel1D StbVelx StbVely StbVelz blkdat cif3 htif input namlst tf1ds1 tf3ds tf3ds1

INCLUDE: vckdat
PURPOSE: Defines common-block `vckdat`.
Source file: vckdat.h
INCLUDEd by: blkdat

INCLUDE: vdvmod
PURPOSE: Defines common block `vdvmod`.
Source file: vdvmod.h
INCLUDEd by: StbVel1D StbVelz blkdat tf1ds1 tf3ds1

INCLUDE: vellim
PURPOSE: Defines common block `vellim`.
Source file: vellim.h
INCLUDEd by: StbVel1D out1d pump2 pumpsr tf1ds1

INCLUDE: webnum
PURPOSE: Defines common block `webnum`.
Source file: webnum.h
INCLUDEd by: StbVel1D blkdat cella3 cif3 htif