

2001

SSC-K 가

Development on Visualizing the Analysis Results of SSC-K
for KALIMER Transient Safety Analyses

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SSC-K 가 () . SSC-K 가

Abstract

This Paper is about the Visualization Development for Analysis Results Of SSC-K(Super System Code for KALIMER), Transient Safety Analysis Code for KALIMER-Korea Advanced Liquid Metal Reactor) under development in KAERI. The Contents of Visualization are as follows: Comprehending Conditions out of Real-Time Transient Simulation, the variations of key variable, and visualizing those analyses using SSC-K. Ultimately, it will be expected to increase efficiency for the Complex Calculated Results of Safety Analyses and the development of KALIMER in KAERI.

1.

Metal Reactor:) KALIMER(Korea Advanced Liquid
SSC-K

SSC-K 가 NPA4K v2.5
 NPA4K v2.5 SSC-K
 KALIMER
 KALIMER

2. SSC-K NPA4K v2.5

2.1

KALIMER

SSC-L SSC-K가
 KALIMER

2.2 SSC-K 가

SSC-K NPA4K v2.5
 Digital Visual Fortran Language SSC-K DLL(Dynamic Link
 Library) DLL NPA4K v2.5
 Graphical User Interface SSC-K NPA4K v2.5
 가 가
 가
 DLL SSC-K

```

datnpa(1) = s9mstr  master time
datnpa(2) = z6nalv  height of sodium in hot pool above
z6tcor(height of core
              top)
datnpa(3) = z6cldp  height of sodium in cold pool above
z6tcor(height of
              core top)
datnpa(4) = rdopp   Doppler reactivity
datnpa(5) = rvoid   Void reactivity
datnpa(6) = rgrow   Axial exp. reactivity
datnpa(7) = rgrwd   Radial exp. reactivity
datnpa(8) = rcrdl   CRDL exp. reactivity
datnpa(9) = rgem    GEM reactivity
datnpa(10) = rinst  Inserted reactivity
datnpa(11) = rtrho  Total reactivity
datnpa(12) = -1.0 !no pipe break
datnpa(12) = 1.0 ! pipe break option?
datnpa(13) = -1.0 !if (usubpt(iusubp+1).lt.1.0 .and.
usubst(iusubs+1).lt.1.0)

```

```

datnpa(13) = 1.0 !otherwise
datnpa(14) = f5pnrn*100. Power (%)
datnpa(15) = z6nalv*100./(z6vstp-z6tcor) Hot pool level
datnpa(16) = z6cldp*100./(z6vstp-z6tcor) Cold pool level
          z6nalv: height hot pool level above z6tcor
          z6vstp: height of reactor vessel top
          z6tcor: height of core top
          zclad: height cold pool level above z6tcor
datnpa(17) = t6naa hot pool temp.
datnpa(18) = t6cldp cold pool temp
datnpa(19) = t1outl(it1otl+1)Core inlet temp.
datnpa(20) = t1ouhx(it1ouh+1) Sodium temp. of IHX shell
side(primary) outlet
datnpa(21) = W1ONE(IW1ONE+1) Flow rate before pump and pipe
break
datnpa(22) = W1TWO(IW1TWO+1) Flow rate of downstream of
pump
datnpa(23) = W1THRE(IW1THR+1) Flow rate of downstream of
break
datnpa(24) = w6ovf Flow rate of overflow
datnpa(25) = w1brek(1) Break flow

```

2.3 SSC-K 가

2.3.1 SSC-K 가

SSC-K 가

- SSCUnit : DLL SSC-K
- ReadUnit : Time Interval
- ChooseUnit :
- GraphUnit :
- ExtensionUnit : Hot Pool
- TfieldUnit : Color Index 가

2.3.2 SSC-K 가

SSC-K SSC-K DLL

.(1)

- Main Menu , Outlookbar

- Selecting Time Interval

Time Interval ,

- Selecting Output file

- Run Run from file
- Run Run SSC
SSC-K dll
- Operation Pause
Display . StopProcess :=1
- Operation Resume
StopProcess :=0, ResumeProcess :=1
- Operation Reset
(iflag_end=1)m OutputFile
- Operation Graph
hot Pool , Hot Pool
- Operation Extension
iflag_intExt := 1 Extension Hot Pool
'1'

가 가

		가
Time Interval		TimeAvailable
Output file		FileAvailable
Run from file	OnReadProcess	ReadAvailable
Run SSC	OnDIIProcess	DIIAvailable
Pause	StopProcess	PauseAvailable
Resume	ResumeProcess	ResumeAvailable
Reset		ResetAvailable
Graph		GraphAvailable
Hot Pool Extension	ExtensionProcess	ExtensionAvailabl e

1. SSC-K 가

Initializing , UpdatMenu , Display , GraphDisp
, ExtensionDsp

○ KalimerUnit Initializing

InitialProcess

False , Hot Pool Color Index 600
900

○ KalimerUnit UpdatMenu

가 , Outlook Bar

Exception Error

o KalimerUnit Display

DLL NewOutput

o KalimerUnit GraphDisp

o KalimerUnit ExtensionDsp

Hot Pool

3. SSC-K 가

SSC-K Visualization

Parameter 가

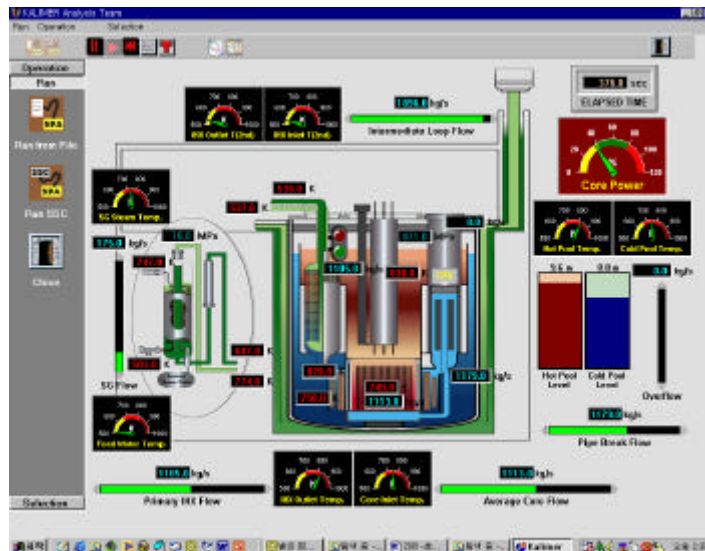
Plant Mimic Plant Mimic

가 가

X-Y , 20

10

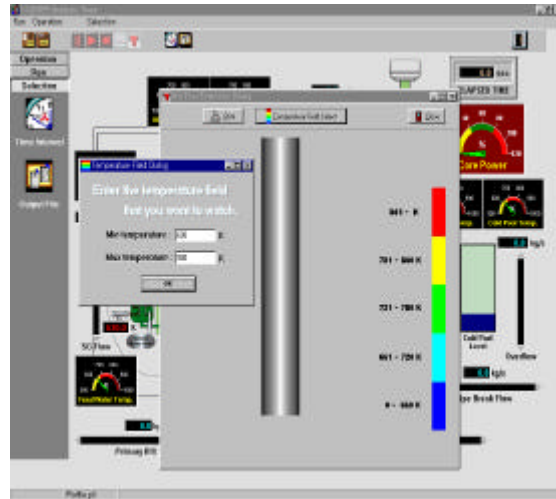
Parameters Hot Pool Level, Cold Pool Level, Doppler Reactivity, Void Reactivity, Radial Exp. Reactivity, CRDL Exp. Reactivity, GEM Reactivity, Hot/Cold Pool Temperature, Overflow



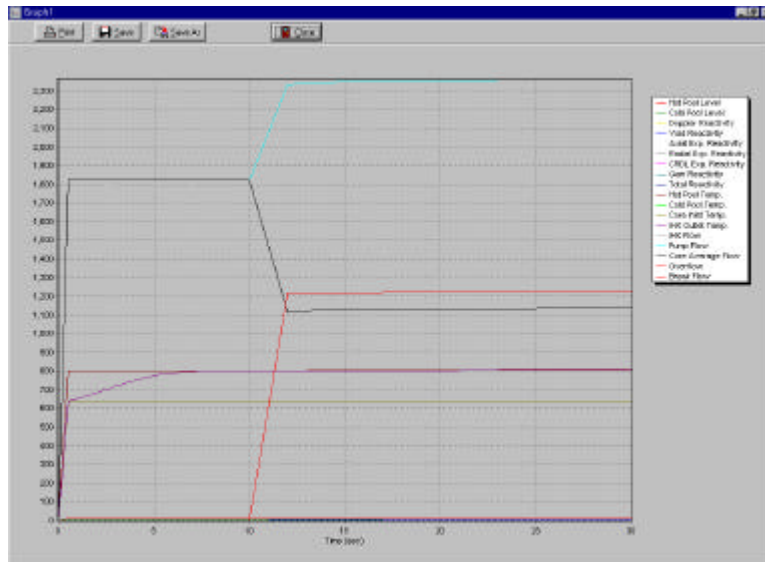
1. 가 Plant Mimic



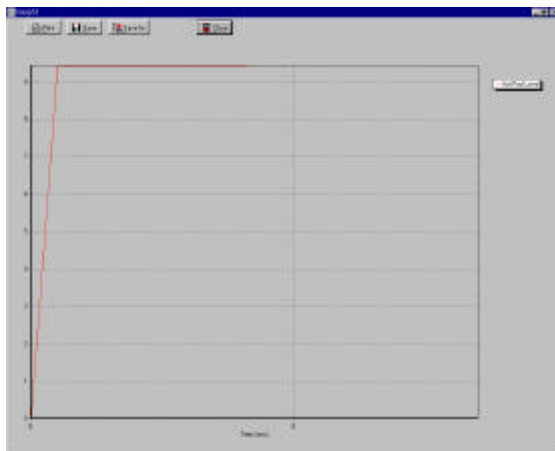
2. Choose Parameters



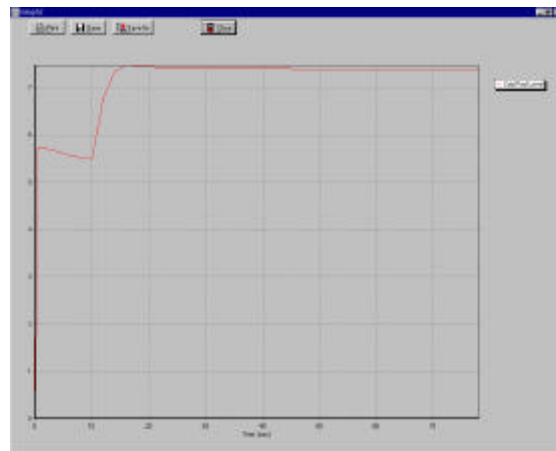
3. Temperature Field



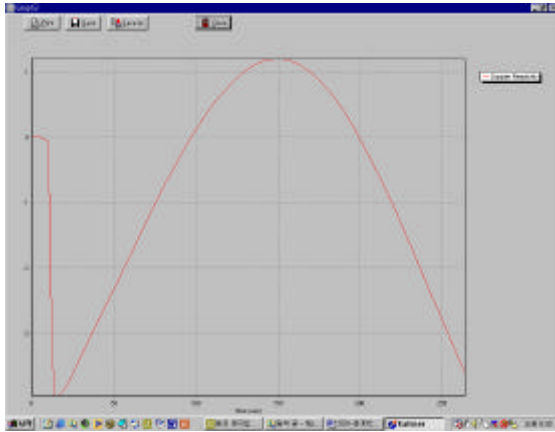
4. Total Parameters



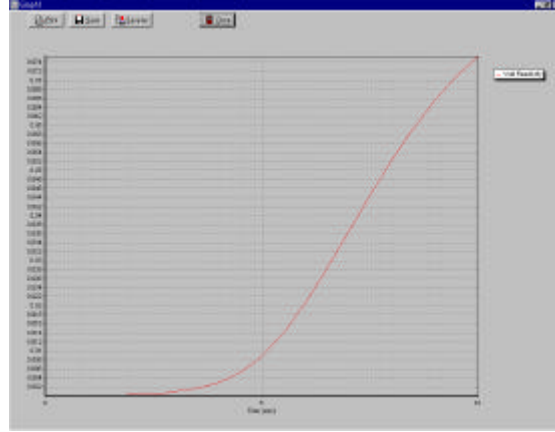
5. Hot Pool Level



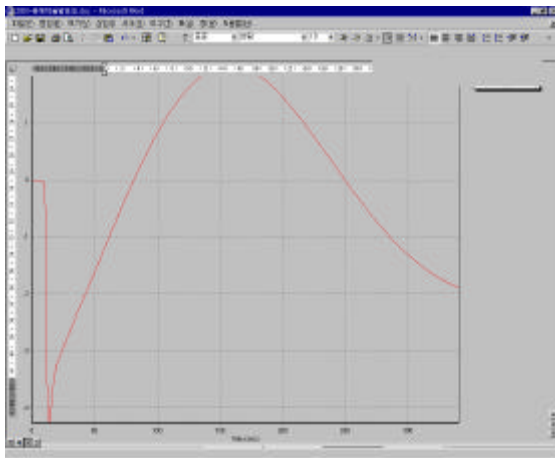
6. Cold Pool Level



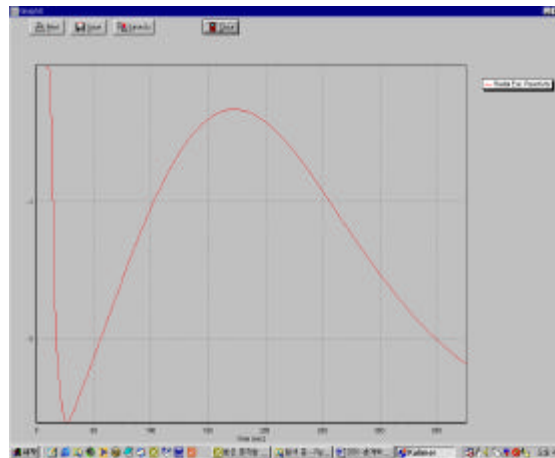
7. Doppler Reactivity



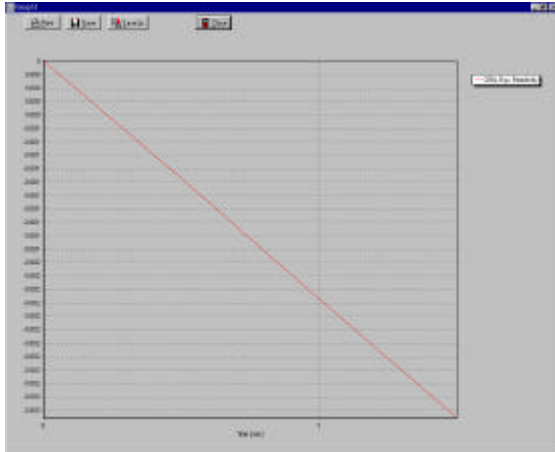
8. Void Reactivity



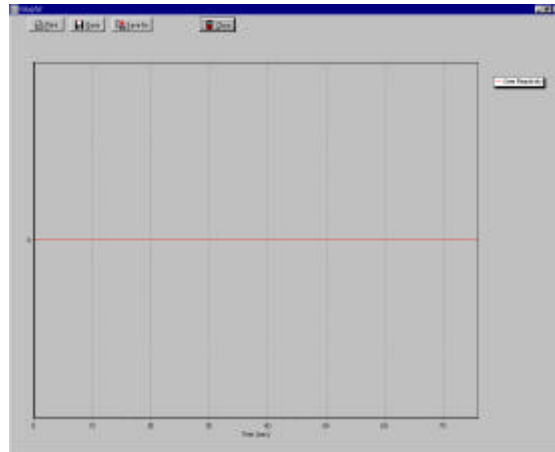
9. Axial Exp. Reactivity



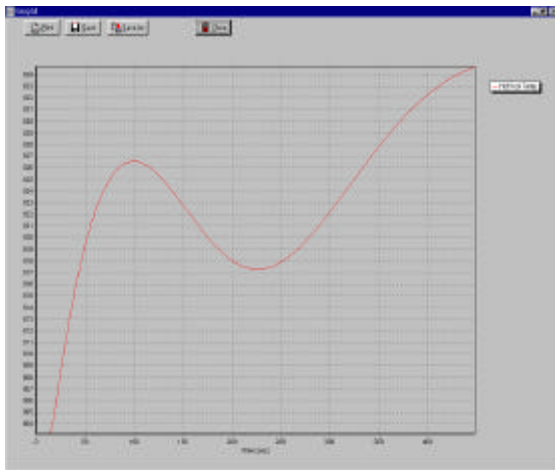
10. Radial Exp. Reactivity



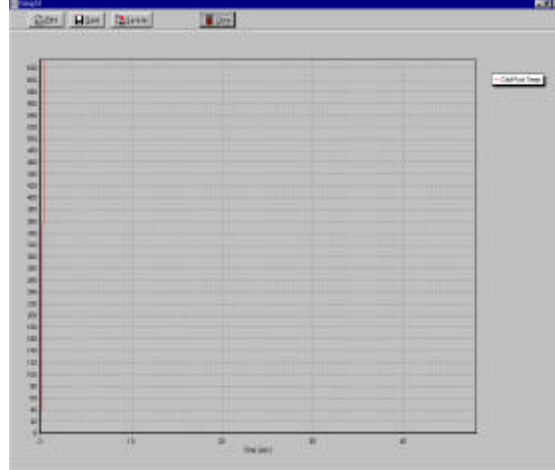
11. CRDL Exp. Reactivity



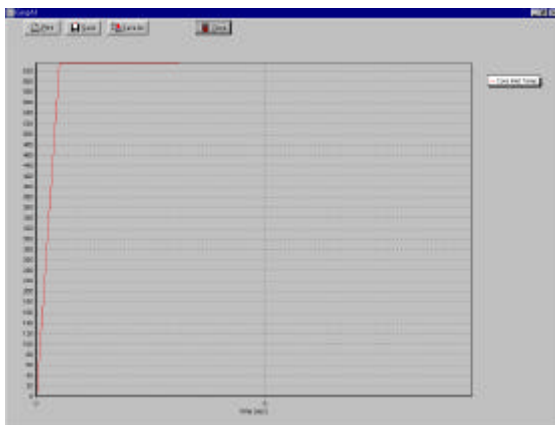
12. Gem Reactivity



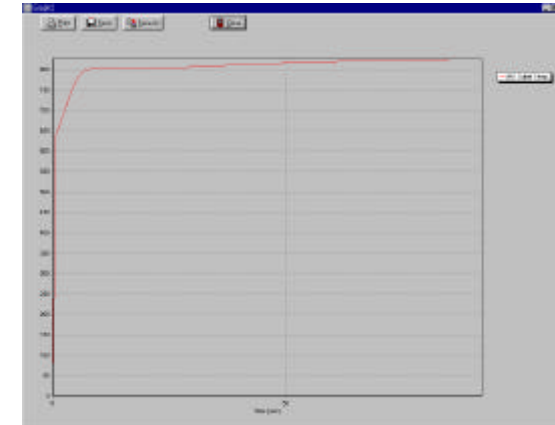
13. Hot Pool Temp.



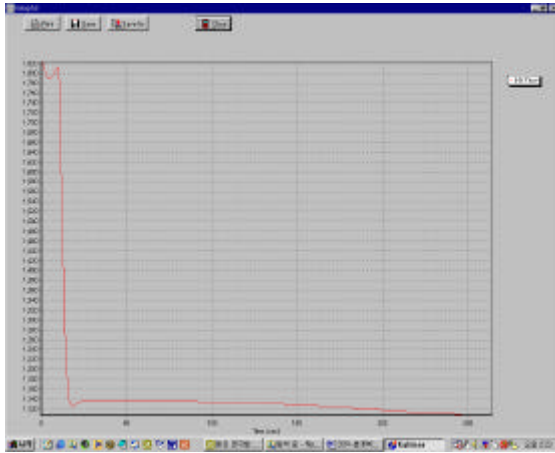
14. Cold Pool Temp.



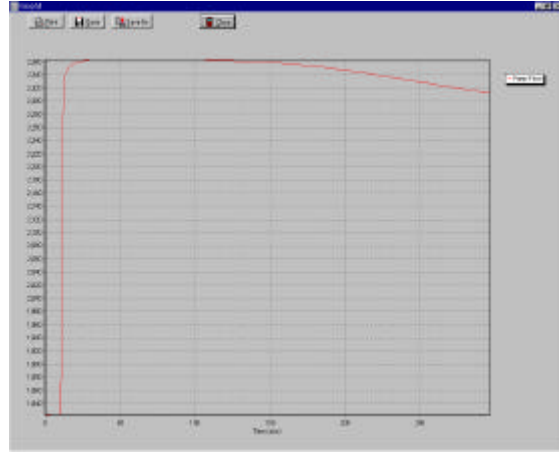
15. Core Inlet Temp.



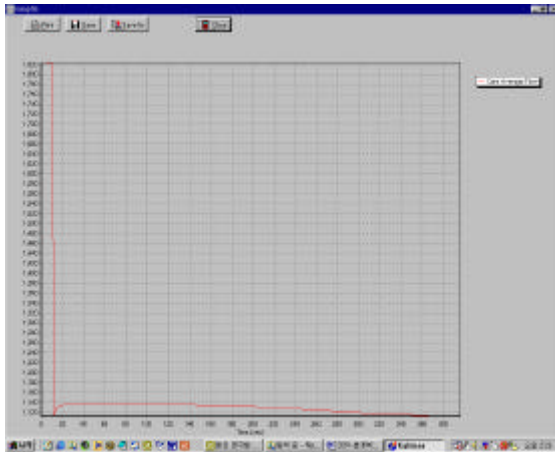
16. IHX outlet Temp.



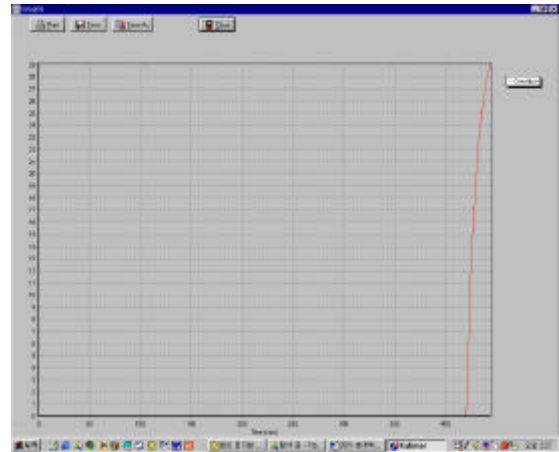
17. IHX Flow



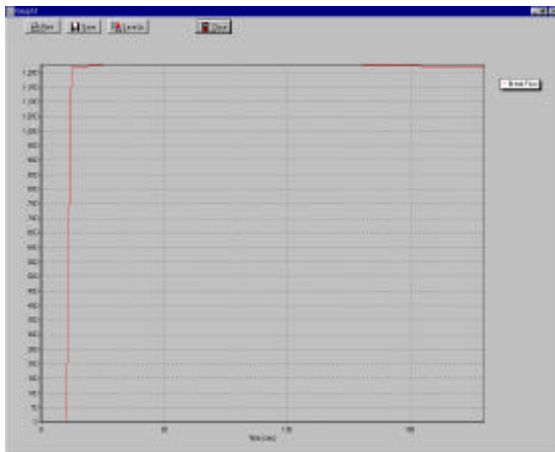
18. Pump Flow



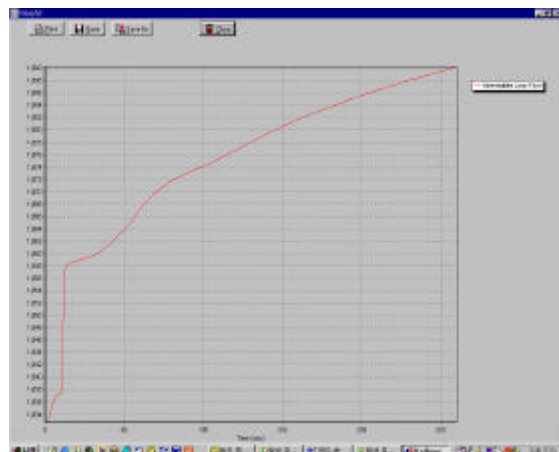
19. Core Average Flow



20. Overflow



21. Break Flow



22. Intermediate Loop Flow

4.

SSC-K

One-Stop

5.

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“Preliminary Safety Analysis for Key Design Features of KALIMER”, 6, KAERI/TR-1616/2000(2000)

“Development of a GUI Based RETRAN Running Environment for Kori Units 1 & 2”, 3, KAERI/TR-1644/2000(2000)

“Technical Manual for the Nuclear plant Analyzer CENTS Mode Rev.1”, May, 1994(1994)

“Nuclear Plant Analyzer Development”, 10, KAERI/RR-902/99(1989)