IAEA-SR-208/34

XA9952500

Y2K ISSUES FOR REAL TIME COMPUTER SYSTEMS FOR FAST BREEDER TEST REACTOR

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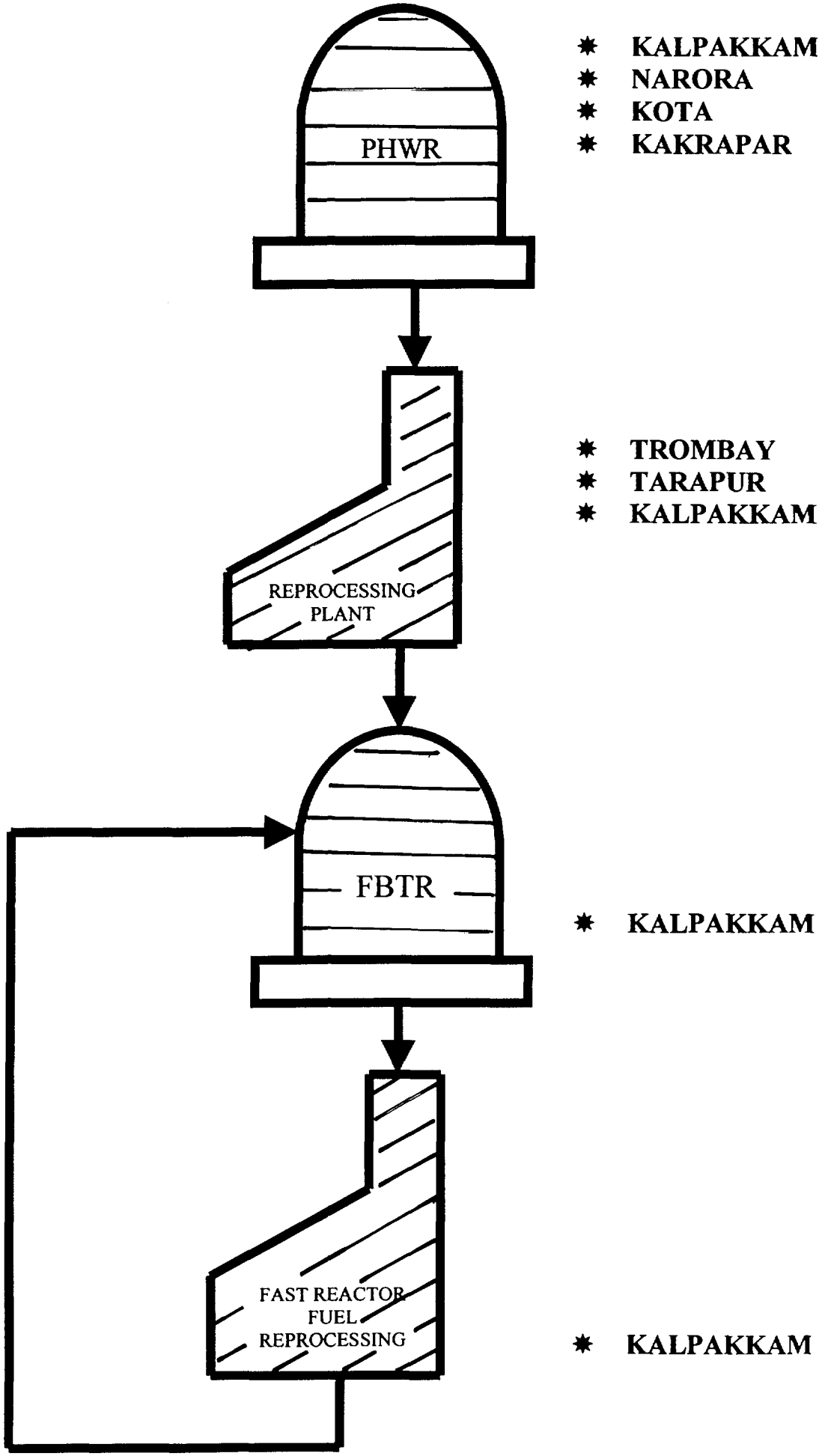

PHWR
REPROCESSING PLANT
FBTR
FAST REACTOR FUEL REPROCESSING
KALPAKKAM
NARORA
KOTA
KAKRAPAR
TROMBAY
TARAPUR
KALPAKKAM
KALPAKKAM
KALPAKKAM

REAL TIME SYSTEMS

CLASSIFICATION (IEC 1226)

CATEGORY –A

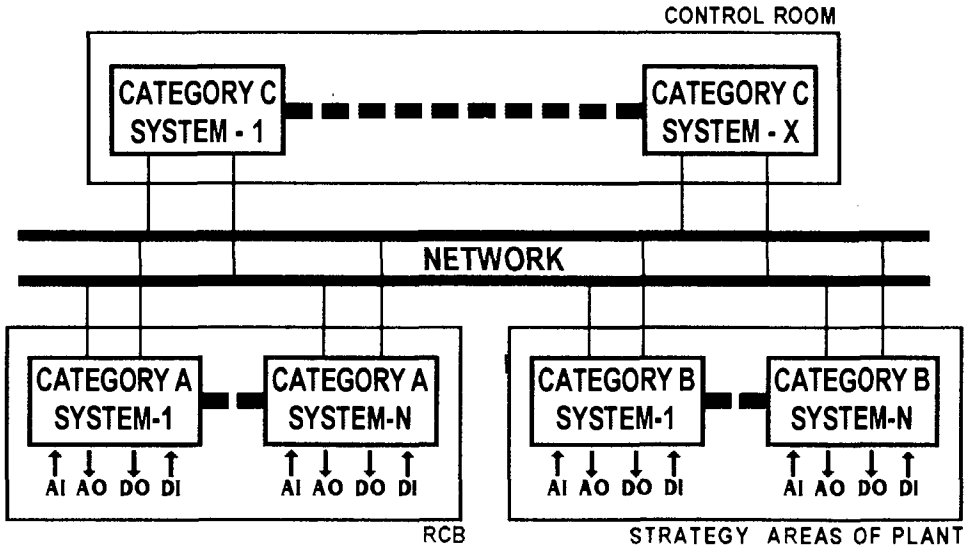
- MITIGATE THE CONSEQUENCES OF PIE
  - CORE TEMPERATURE MONITORING SYSTEM
  - REACTIVITY CALCULATION SYSTEM

CATEGORY-B

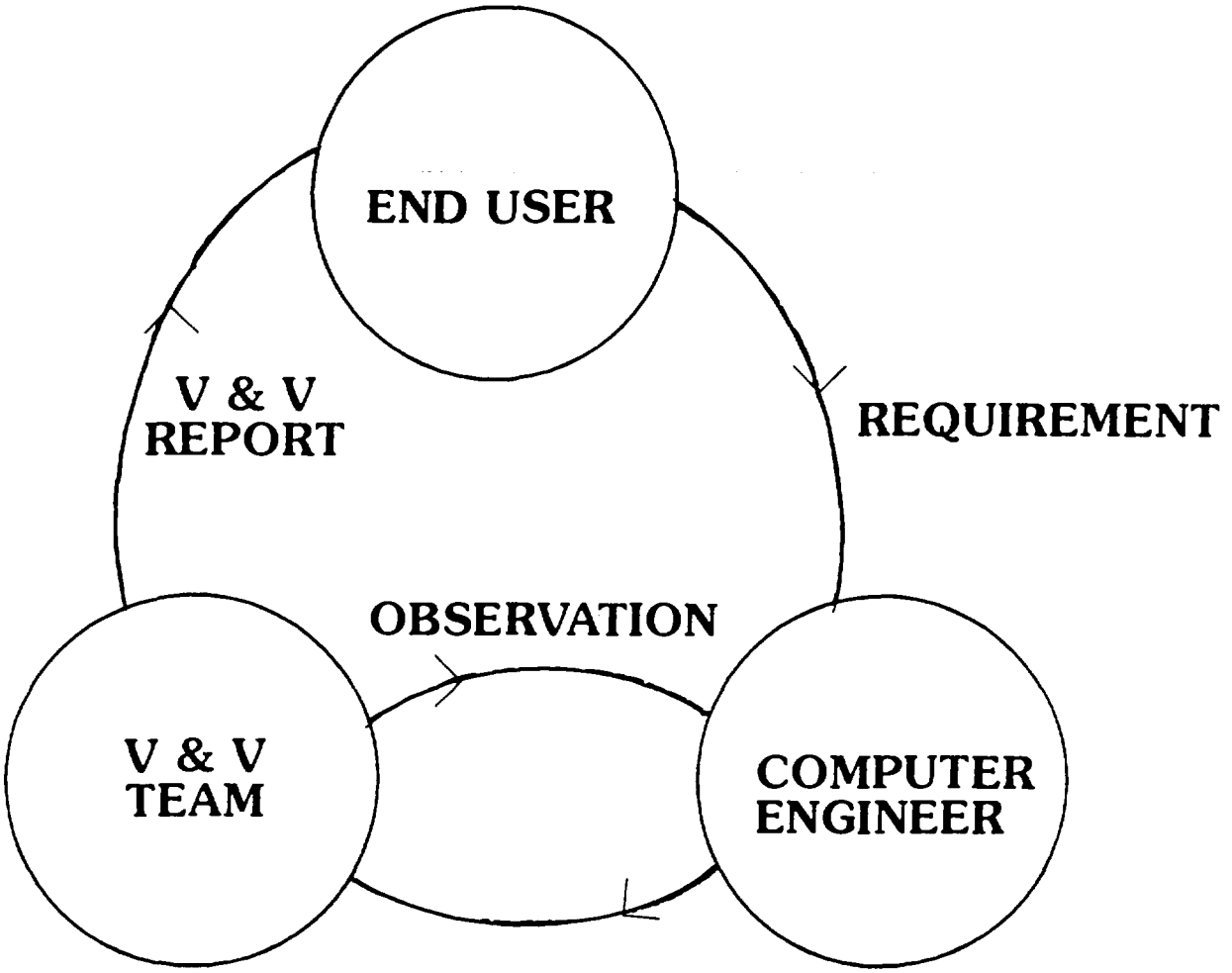
- COMPLEMENTARY ROLE TO CATEGORY-A SYSTEMS
  - FINE IMPULSE TEST
  - STARTUP REACTOR CHECK
  - ALARM GENERATION SYSTEM
  - DISCORDANCE SUPERVISION SYSTEM
  - SG LEAK DETECTION SYSTEM
  - DROP TIME MEASUREMENT SYSTEM

CATEGORY-C

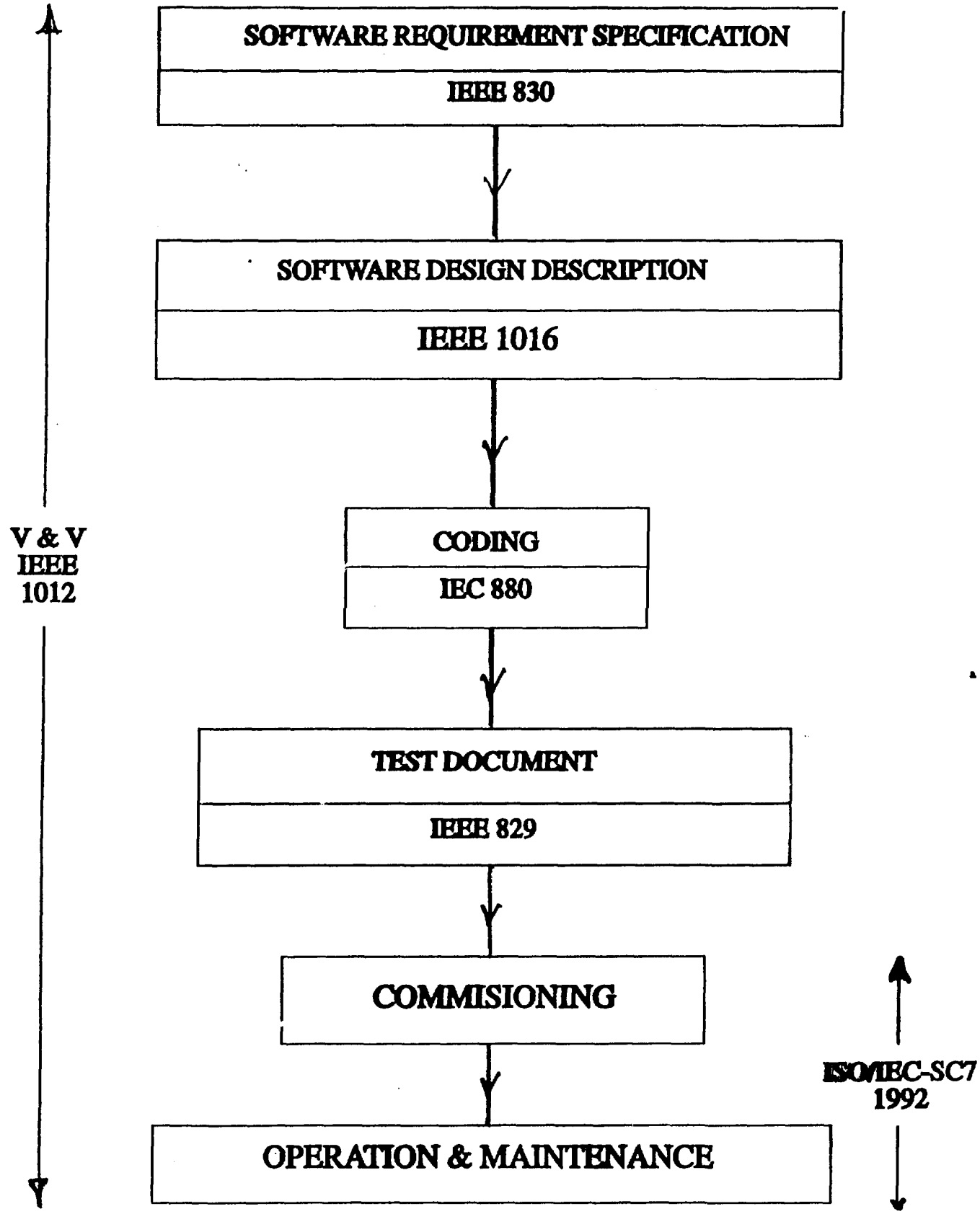
- OPERATOR INFORMATION SYSTEMS


CONTROL ROOM
CATEGORY C SYSTEM - 1
CATEGORY C SYSTEM - X
NETWORK
CATEGORY A SYSTEM-1
CATEGORY A SYSTEM-N
CATEGORY B SYSTEM-1
CATEGORY B SYSTEM-N
AI AO DO DI
AI AO DO DI
AI AO DO DI
AI AO DO DI
RCB
STRATEGY AREAS OF PLANT

DDCS



CONFIGURATION MANAGEMENT



SOFTWARE LIFE CYCLE

Fig.8

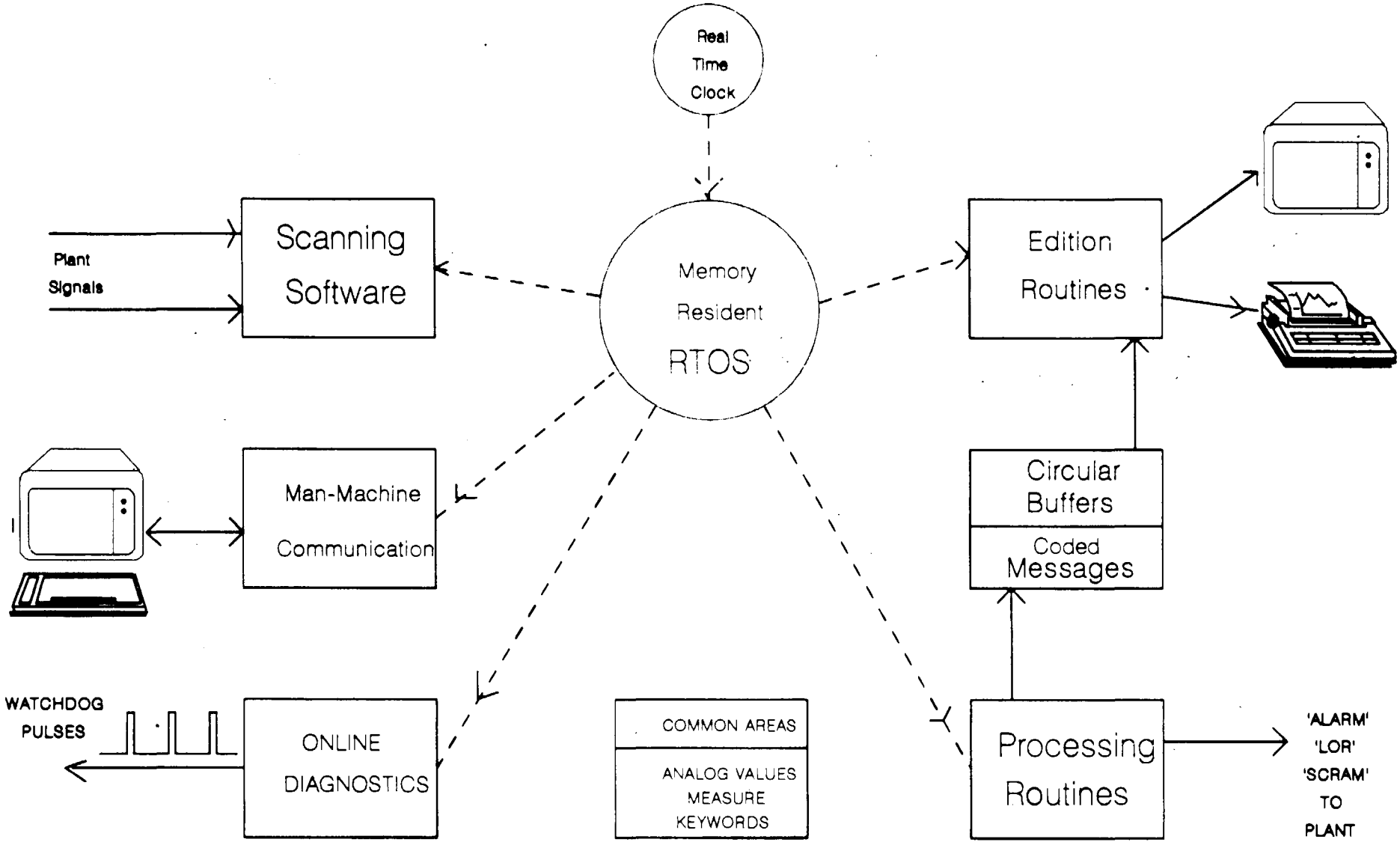


Fig.1 **Software Scheme In Supervisory Computer of FBTR**

Experience :

Experience in teaching and research. Research areas include artificial intelligence, expert systems, natural language processing

Present field of activity :

Agent based distributed software development, Automatic software documentation, Spatial, Temporal and Intelligent date Databases

173. Co-Investigator :

Name	: Mrs.V.Uma Maheswari
Date & Place of birth	: 01.06.1956 Coimbatore
Nationality	: Indian
Present Post	: Senior Lecturer
Qualification	: M.Sc. (Maths), M.Tech (Computer Science & Engg) IIT, Madras
Experience	:

15 years of experience in teaching and research. Interested areas include theoretical computer science, algorithms, data structures, compiler Design, Operating System

Present field of activity :

Object oriented approach to software development. Formal languages and specification.

174. Name of Participant : Shri P.Swaminathan
Date & Place of birth : 07.03.1949
Nationality : Indian
Present Post : Head, Electronics & Instrumentation Division
Name of the Institution : Indira Gandhi Centre for Atomic Research, Kalpakkam
Qualification : B.E.(Hons) Electronics & Communication Engg,
- First Rank in Madras University - May 1971

- BARC Training School (15th Batch) 1972, Second Rank

- MBA with specialisation in Operation Research

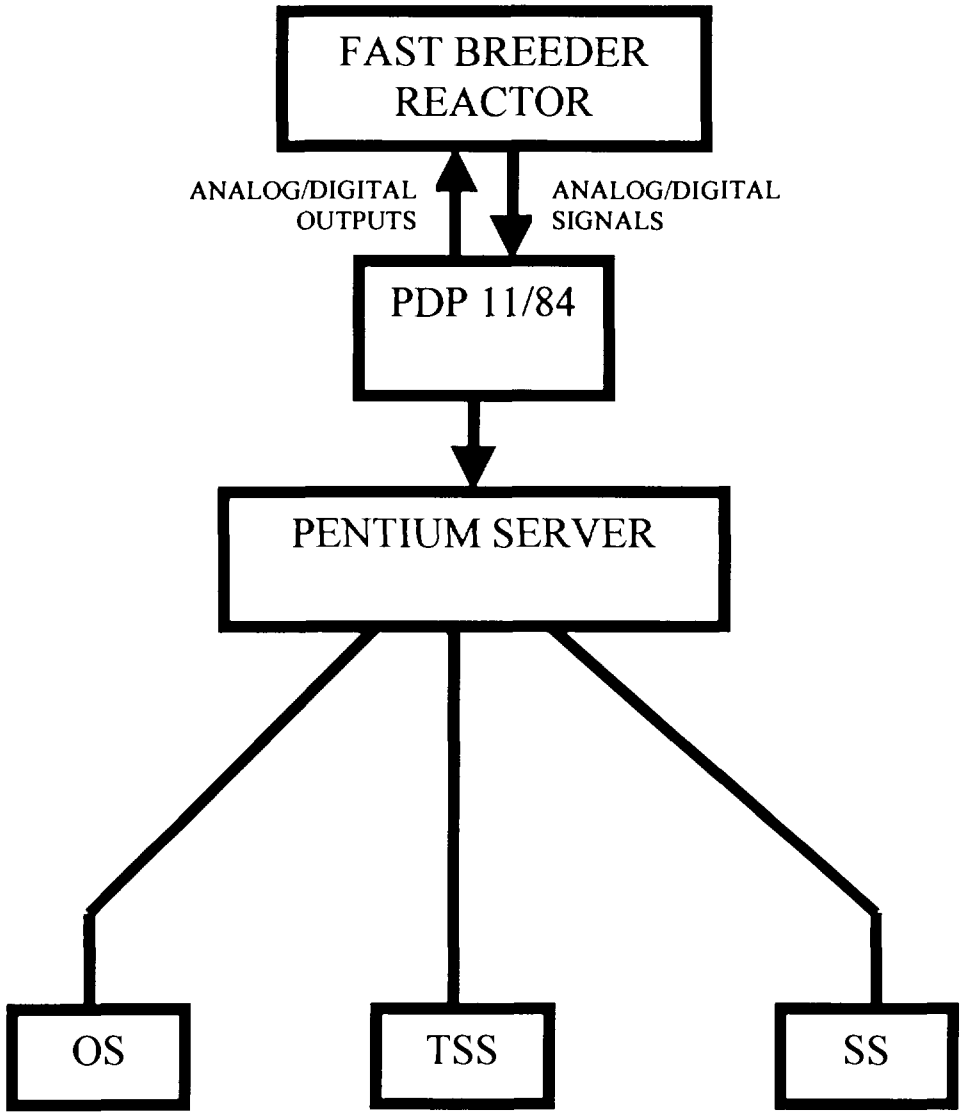
Experience : Twenty five years of experience in design, development, Installation, commissioning, operation and Maintenance of Computer based supervision and control systems for Nuclear Installations.

PDP11/84 SYSTEM

START UP:
- YEAR : 00 TO 99
- NO CALENDER CHIP
- HR:MN DD-MMM-YY

DIRECTIVE:
- CALL DATE (BUFF)
  (NINE CHARACTER STRING)

PATH:
- BOOT PDP11 WITH YEAR 00 TO99 FOR 2000 TO 2099
- ADD20 BEFORE TWO DIGIT YEAR BEFORE PRINTING/ DISPLAY / STORAGE


FAST BREEDER REACTOR
ANALOG/DIGITAL OUTPUTS
ANALOG/DIGITAL SIGNALS
PDP 11/84
PENTIUM SERVER
OS
TSS
SS

UNIPOWER – 30
(68030)

OS : VERSADOS

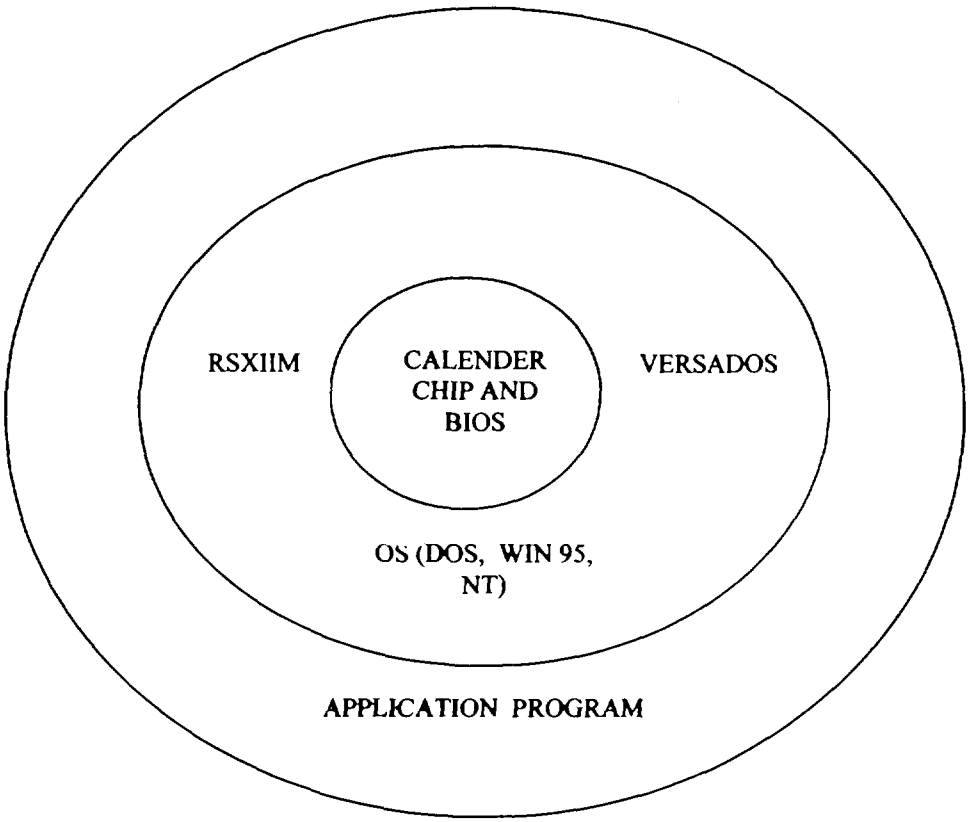
STARTUP :
- NO CALENDER CHIP
- TWO DIGIT FOR YEAR (MM/DD/YY)
- RANGE 80 TO 99

DIRECTIVE: LONG *PCDAT, *PCTIM
LGTDTIME (PCDAT, PCTIM)
NO OF DAYS FROM 1980 IN pcdat.

PATCH : BOOT WITH YY AS 80 TO 99
FOR 2000 TO 2019

MODIFY FUNCTION TO DECIDE
DATE FROM VALUE IN pcdat

Y2K PROBLEM



BIOS	:	1900 to 2099
DOS/95/NT	:	1980 to 2099
RSX II M	:	1900 to 1999
VERSADOS	:	1980 to 1999
APPLICATION PROGRAM	:	1900 to 1999

'C' PROGRAM: OVERFLOW AT 2038

IBM PC/AT

❖ SYSTEM WITHOUT CALENDER CHIP

- DATE BY ENTERING THROUGH KEYBOARD
  - **MM-DD-YY**
  - **TWO DIGITS :RANGE 80 TO 99**
  - **CENTURY INFORMATION (19) ADDED**
- DATE BY ENTERING FOUR DIGITS
  - **MM-DD-YY**
  - **RANGE 1980 TO 2099**
- CALENDER CHIP RANGE 1900 TO 2099
- INCREMENT FROM 31 DEC 1999 TO
  - **1 JAN 1980 (AMI BIOS)**
  - **1 JAN 2000 (AWARD BIOS)**
- DURING START UP, TIME & DATE COPIED BY OS TO RAM AREA
- TIME & DATE MAINTAINED BY TIMER-0 INTERRUPT

APPLICATION PROGRAMS IN IBM PC/AT

- SYSTEM CALL FUNCTIONS IN TURBO PASCAL

AH REGISTER	FUNCTION
2A	GET DATE CX:YEAR (1980 –2099) DH:MONTH (1-12) DL:DAY (1-31)

APPLICATION PROGRAM TO USE CX CONTENTS

- 'C'
  CLOCK – T (CLOCK (VOID)
  TIME – T TIME (TIME – T*TP)
  - **OFFSET IN SEC FROM 1970**
  - **OVERFLOW IN 2038 (32 BIT STORAGE)**
- DATE (VISUAL BASIC)
  - **RETURNS 10 CHARACTER STRING MM-DD-YYYY**

APPLICATION PROGRAM FORMAT IS IMPORTANT