

KALIMER 가
The development on the methodology of the Initiating Event
Frequencies for Liquid Metal Reactor KALIMER

150

가 / PRISM PSA , 가,
KALIMER PSA .
KALIMER
가 .

Abstract

In this paper, the PSA methodology of PRISM, Light Water Reactor, Pressurized Heavy Water Reactor are analyzed and the methodology of Initiating Events for KALIMER are suggested. Also, the reliability assessment of assumptions for Pipes Corrosion Frequency is set up. The reliability assessment of Passive Safety System, one of Main Safety System of KALIMER, are discussed and analyzed.

1.

가(Probabilistic Safety Assessment, PSA)

, PSA

가

KALIMER

가 PSA

KALIMER
KALIMER PSA

GE
PRISM PSA

PRISM

가

KALIMER

2. KALIMER PSA

KALIMER GE PRISM , KALIMER PSA
PRISM PSA

2.1

Master Logic Diagram

PRISM PSA
/ PSA , 'RVACS Blockage'

2.2

PRISM PSA / PSA
PRISM PSA 23

2.3

12 , 23

KALIMER PSA , KALIMER PSA
:

PRISM KALIMER
PRISM I-Pu-Zr . KALIMER Na-U235-U238

2.4

/ PSA

PRISM PSA KALIMER
 가 PRISM , PRISM PSA KALIMER
 PSA

2.5 가
 가
 가 가 . 가
 가
 . PRISM PSA 가 (>0.825g)
 , 가 KALIMER PSA

		PRISM PSA	/ PSA	KALIMER PSA
1			MLD PSA	MLD PSA
		/	/	/
2		가		가
			가	가
3				

1. PSA

3. 가

PSA . PSA
 가
 가
 가 . 가
 가

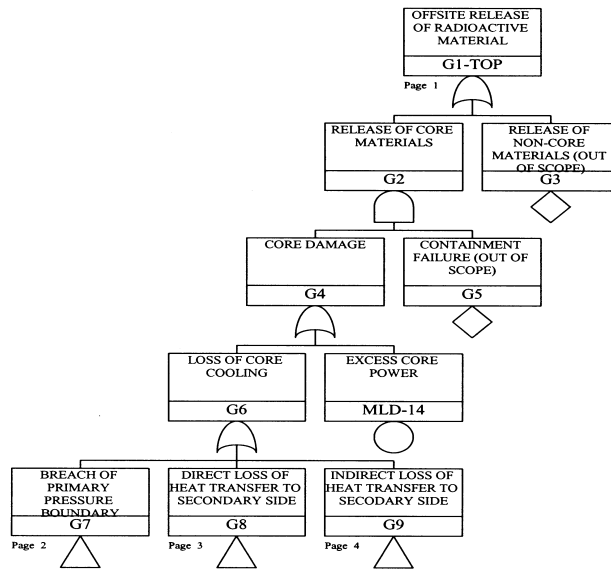
PSA

3.1

3.1.1 가
가

가 PSA 가

3.1.2 가
가



1. Master Logic Diagram

PRA Procedure Guide

"Excessive Offsite Release"

" (Master Logic Diagram; MLD)"

1

Level 2

Level 3

Level 4

(Safety Function)

, Level 5

Level 4

Level 4

가

가

가

3.1.3

(Failure Mode and Effects

Analysis; FMEA) . FMEA

()

- (Bottom-Up)

. FMEA

(Support System)

1

3.2

가

가

가

2가

3.2.1

가

가

가

가

3.2.2

가

가

(1) Initiator Enabler

(2)

(3) (Basic Event)

(4)

Initiator

가
Enabler

Initiator

Initiator

Initiator, Enabler

Initiator/Enabler

가

Initiator

Enabler

To Repair, MTTR)

(Mission Time)

(Mean Time

가
MTTR

Enabler가

Initiator
가

1

가

Enabler

Enabler

가

FR

가

MTTR 72

3.13E-3/yr가

가

가

Initiator가

가

가

가

가

4.

가

PSA가

가

PRISM

, ALWR (Advanced LWR)

가

가

가

(Inherent Shutdown Process)

4.1.1

4 가
가
가
가

4.1.2

NUREG-1150 PSA 4가
-
-
- ,
- Base case

(Accident Initiator)

"base case" 가
PSA
가
(, ALWR URD) 가
가
가
가

가
가
3
가
가
"base case"

4.1.3 가

가
(base case
가)
가

4.1.4 가

가
가
가

4.1.5

PSA

5.

가,
가
PSA
가

가

가

PSA

/

/

KALIMER PSA

가 가

PSA

SSC (System, Structure & Component)

가

PSA

가

SSC

가

가

(Reliability-Physics)

PSA

가

가

가

PSA

KALIMER

PSA

KALIMER

6.

7.

[1] PSA Procedure Guide, NUREG/CR-2815, Aug., 1985

[2] PRISM Preliminary Safety Information Document, GEFR-00973, UC-87Ta, Dec., 1987

[3] Pre-application Safety Evaluation Report for the PRISM Liquid Metal Reactor, NUREG-1368, Feb., 1994

[4] "Level 2 Probabilistic Safety Assessment for PHWR", KEPRI, 1997

[5] Final Level 1 Probabilistic Risk Assessment for Younggwang Nuclear Unit 3&4, ABB-CE, KAERI, 1992

[6] Final Level 1 Probabilistic Risk Assessment Update for Younggwang Nuclear Unit 3&4, KAERI, 1993

[7] "Safety Goals for the Operations of Nuclear Power Plants, Policy Statement" 28044 Federal Register, Vol. 51,

No. 149, Monday, Aug. 4, 1986

[6] ,

가 , KAERI/AR-524/99, 1999