

Level 2+ PSA 가

A Source Term and Risk Calculations Using Level 2+ PSA Methodology

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Level 2+ 가 가 가 DB , 가 ORIGEN, MELCOR, MACCS Level 2+ 가 , 가 IPE

Abstract

The scope of Level 2+ PSA includes the assessment of dose risk which is associated with the exposures of the radioactive nuclides escaping from nuclear power plants during severe accidents. The establishment of data base for the exposure dose in Korea nuclear power plants may contribute to preparing the accident management programs and periodic safety reviews. In this study the ORIGEN, MELCOR and MACCS code were employed to produce a integrated framework to assess the radiation source term risk. The framework was applied to a reference plant. Using IPE results, the dose rate for the reference plant was calculated quantitatively.

1.

(Release Parameter) (Source Term) [1-3]. 2 PSA 가 WASH-1400 SNL Siting Study Iodine Tellurium 가 NUREG-0956 WASH-1400 가 NRC 가 가

가
 (Consequence Analysis) CRAC-2 3 PSA ,
 MACCS Sr-92, Y-92, Y-93, Ba-139, La-141, La-142 54 가 60
 , MACCS 60 9

2. 가

, MELCOR ORIGEN MELCOR 가 . ORIGEN
 . 2 PSA

가

3 PSA

. ORIGEN-S

3

(Decay Chain)

[4].

FSAR

1

13,661 MWD/MTU

3.

3.1 ORIGEN

Batch

, U-235 U-238
 Batch U-235 U-238 ORIGEN
 U-235 U-238 ORIGEN

3.2

MELCOR

IPE(Individual Plant Examination)

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(STC; Source Term Category)

- (Containment Bypass : CONBYPASS)
- (Containment Isolation Status : CONISOLAT)
- (Core Melt Progression Stopped before RV Failure/Debris Cooled In-vessel: MELTSTOP)
- (No Alpha Mode Containment Failure : NO-ALPHA)
- (Time of Containment Failure : TIME-CF)
- (Mode of Containment Failure : MODE-CF)
- (Debris Cooled Ex-vessel : EXVCOOL)
- (No Recirculation Sprays Failure : NO-RECSP)

IPE

19

STC

STC 3, 8,

MELCOR

17

. MELCOR

가

LBLOCA 가
 가 9가
 가
 MAAP4 MELCOR 가
 [5].

4. 가

4.1 Data

80 km 10
 FSAR 1992 16
 [3]. 1 1

가 가
 MACCS NUREG-1150
 1

가 가
 1.8 m/sec 16km
 16 km 5 % 0.0 W 가 , 0 m

4.2 가

가 가 [6-7].

가 가

가 가

Plume 가 Plume
 Plume 가 Plume
 Plume Plume Plume
 Plume 가 가

가 가 가

가 가

4.3 가

가 1 , 1800, 7200,
10800, 14400, 18000, 21600, 25200 가

가 가 가 가 가
가 가 가 가

가 30 km 가

(0 m) 10, 20, 40, 60 m

가 가 가

가 가

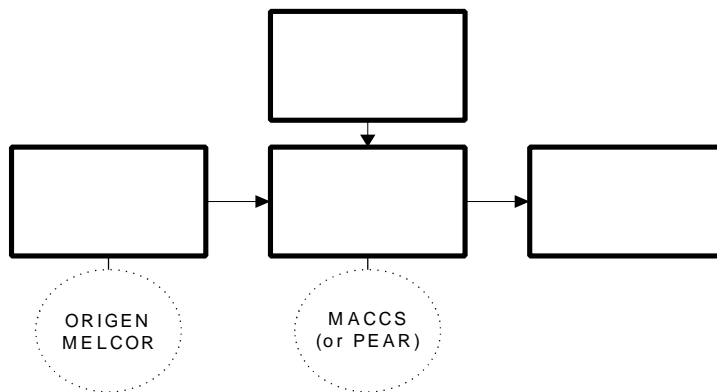
가 20, 40 60 W

가 Plume 가 Plume
가 10 가

LBLOCA가 가 가 가

Loss of Feed Water SBO , SBO가

Loss of Feed Water가 가



1. Level 2+ PSA

5.

가 1 Level 2+ PSA
 가 ,
 가 . ORIGEN/MELCOR/MACCS
 Level 2+ PSA 가 가
 , , 3가 , IPE Dose
 Risk . 가 (가 ,
) 가 .
 “
 가” .

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