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### Development of A Framework for Assessing LCOs in Technical Specifications

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103-15

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가

ASEP

가

LCO 가

#### Abstract

In this study a dynamic framework for assessing LCOs (Limiting Conditions for Operation) in Technical Specifications has been developed and applied to an example associated with the changes of operational modes in PHWRs. The characteristics and mathematical operations in IDs (Influence Diagrams) are described. The IDs are constructed for the example problem and evaluated on the basis of the operations. The component failure rates as well as human error rates in ASEP are used for the data of each node modeled in IDs. The dynamic framework developed in this paper may contribute to the technical basis for assessing.

#### 1.

가

Limits),  
Conditions for Operation),  
Feature)

(Limiting Safety System Setting),  
(Surveillance Requirement)

(Safety  
(Limiting  
(Design

가

가

가

가

, 가

가

가

[1-3].

가

가 가 가  
가 가 (Influence Diagrams)

2.

가 가  
/ /  
PRA 가

(Chance), 가 (Deterministic), 가 (Networks) (Value Node) 가 (Decision),  
가  
[4-7]. 가

가(PSA)

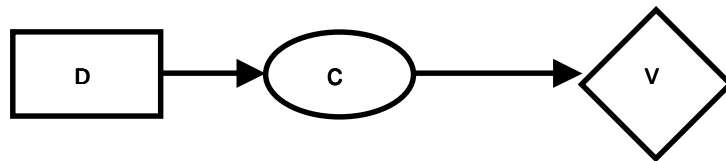
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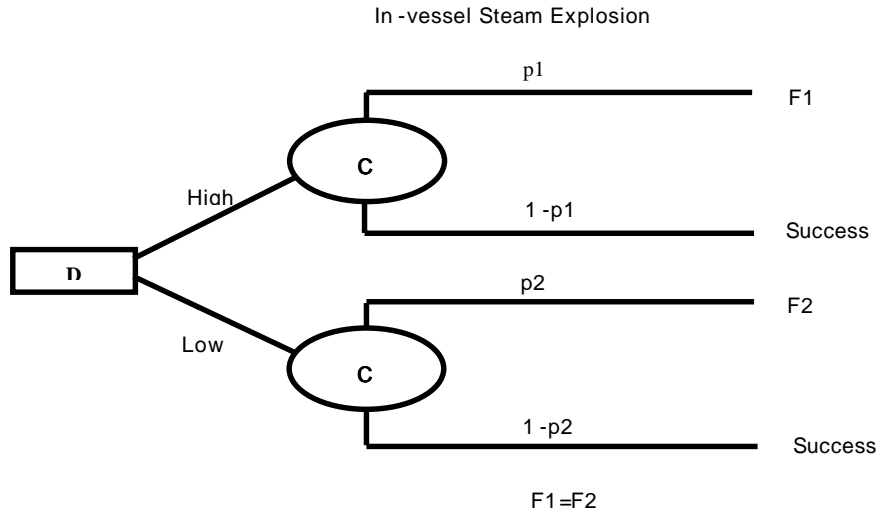
가 가 가 < 1~3 > 1  
, 가 , 가 (Complete Set)  
( ) < 1 > , 가

< 1.a > 가 가 가 D  
( 가 가 C )  
F1 F2 가 p1 p2 가  
C

a)



b)



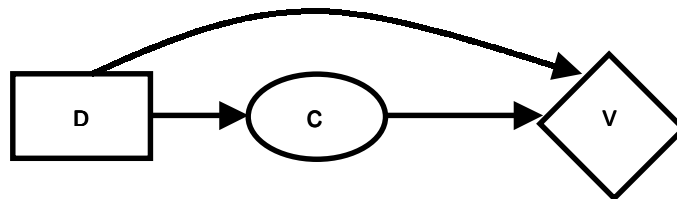
D:  
p1:  
p2:  
F1=F2:

(Consequence)

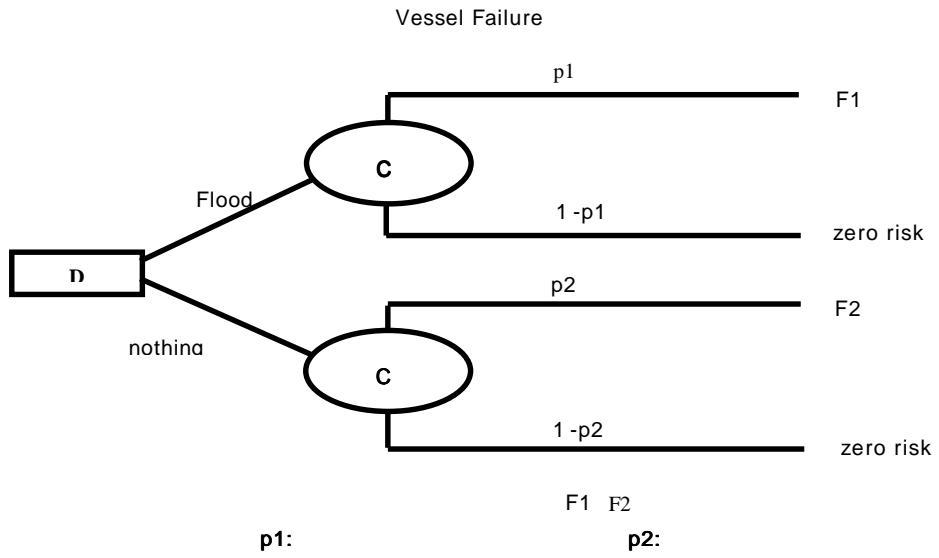
1.

< 2.a> < 1.a> , 가 ( )  
( ) ( ) . < 2.b>  
D (Cavity Flooding) 가  
, C 가  
(p1 p2) , F1 F2 < 2> 가  
C D [8].  
< 3.a> 가 가 , 가  
가 가 C 가  
( ) < 3.a> (F) < 3.b>  
( ) 가  
< 3> .

a)



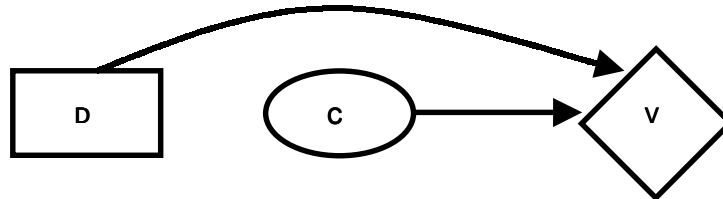
b)



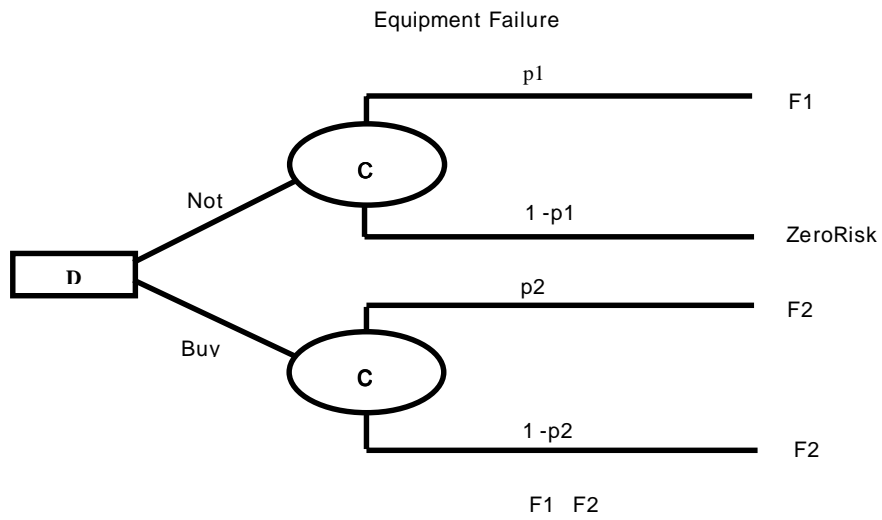
D:  
F1 :  
F2 :

2.

a)



b)



D:

p1:

F1:

F2:

3.

3.

가  
(LCO)

가

3.1

1

1

3.4.3

2

가

가

4

[2].

1

1

1.

1. 1 가 가	1.1 1.2 2	1
2. 1	2.1 3.0.3	

1

가

( 2)

가

1

가

2

가

3.2

가

가

1

2

가

"Op\_Mode2"

"Op\_Mode1"

1

2

< 4 >

가

1

1

2

1

가

가

가

가

가

2

"Normal"

"RCP1/4"

"RCP1/4"

4

가

가

< 4 >

가

가

가

(OM)

가

< 가 4 >

가

(Q)

가 [10].

0.9926

0.0074

0.97

0.03

가

2

2

1

가

가

가

2

"Normal", RCP1/4

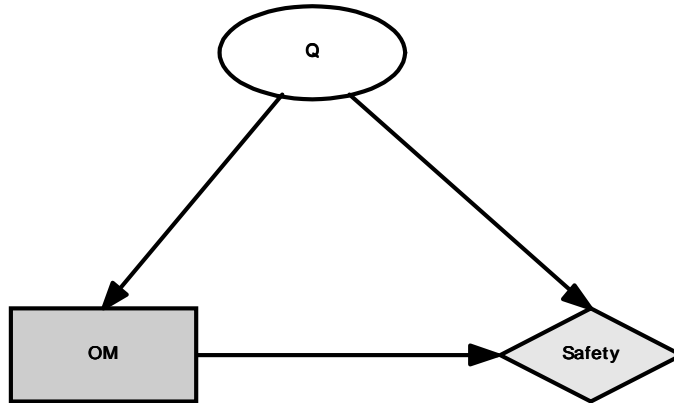
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2

ASEP [10].

2 (a). Q Data

Normal		Failure Event	
Q	valre	Q	Value
Normal	0.9926	Normal	0.03
RCP1/4	0.0074	RCP1/4	0.97



2 (b). OM Alternatives

OM	selection
1	Op_Mode 1
2	Op_Mode 2

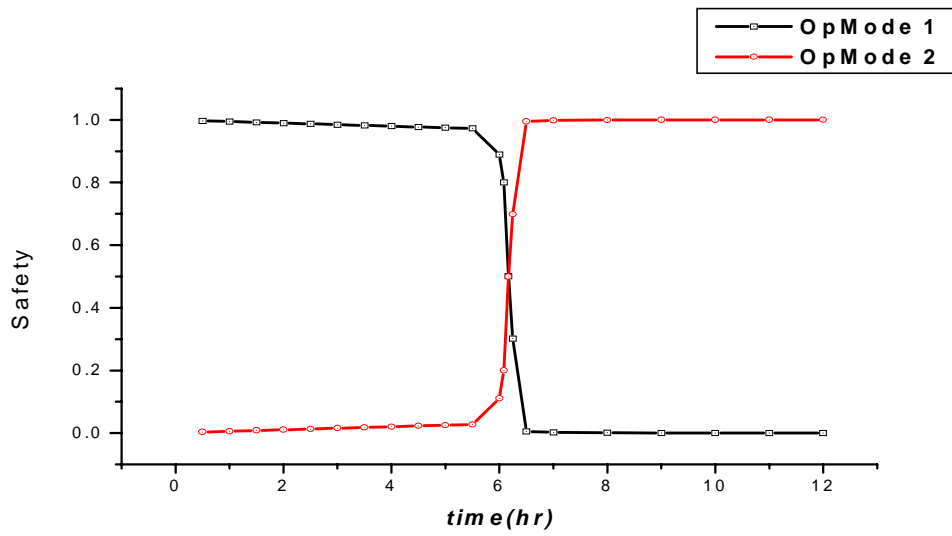
2 (c). Safety Data

	Normal	RCP 1/4
Op_Mode 1	0.9995	0.3
Op_Mode 2	0.0005	0.7

#### 4. RCS

#### 3.3

가 ( :5\*10<sup>-3</sup> ) [9]. (Q) 가  
 , 가 Data 가  
 가 가 가 ASEP  
 . ASEP(Accident -Sequence Evaluation Progrm) HRA 가 [10]. 가  
 , 가 ( t)  
 t=12( ) , t=0 < 5 >



5.

( t) (t=0) (t=12) (t=6)

1 가 5 가 가

6 6 가

2 1 가

6 5 가

4.

가

가

가

가

가

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[2] , Rev 1", 1998

[3] , pp. 37 -43, 2002

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