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**Development of System Dynamics Model  
for Assessment Technology of Organizational and Human Factors on NPP**

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**Abstract**

Previous studies for effect of organizational and human factors on Nuclear Power Plant(NPP)'s safety have used checklist or indicators and probability approach. These approaches have a limit that these can't systematically analyze NPP organizations, because of assumption that organizations are like machines. To overcome this limit, we need to analyze organizations system and explain human errors in organization on assumption that organizations are ecology system. From real data of interview with NPP's employees we develop system dynamics model which can explain the relations of cause and effect among variables, and depict social system for organizational and human factors on NPP's safety.

1.

,  
,  
가

가 , 가 (system dynamics) (model) 가 .

2.

2.1 Checklist

(check) ( (2000); (1998)). , 가 Checklist 가 . Checklist Checklist , 가 가

Checklist

2.2

, THERP, SLIM, HCR (OECD (1999b) ; (2000)). (static)

(dynamic) , ,  
 , 가 가 ,  
 . PRA/PSA  
 PRA/PSA 가 가 .(Carroll and Perin, (1995))  
 ,  
 (machine model) .  
 , (Gharajedaghi, (1999)).  
 , (variable)  
 가 가  
 가 가 ,  
 (interdependent) .

### 3.

#### 3.1

Carroll Perin (Carroll and Perin (1995)). 가 가 가?  
 (activity system) 가?,  
 (the social distribution of shared knowledge) ,  
 (dynamic learning from feedback) 4 가 가  
 가 가 가  
 가 가 가  
 가 가 가  
 (Morgan (1998)).

(ecological system model)

(Scott (1987), Pfeffer and Salacik (1978)).

가 가

(Carroll and Perin, (1995)).

가

(self-organization)

(feedback)

가

가

가

### 3.2 (organizational learning)

가

( (1996)).

(memory)가

가

, 가 가

Making)

(Bounded Rationality)

(Rational Decision

(Simon (1957); Sternman (2000)).

가

가

(Thomson and Van Houten

(1970)),

가

. Kim

가

(mental model)

(Senge (1990))

(transfer mechanism)

(Kim, (1993)).

Carroll

가  
(Carroll (1998)).  
(know-how)

(static memory)

(Kim, (1993)).

가

가

### 3.3

가

가

가

(pattern)(OECD (1999a))

(Anderson and Johnson (1997)).

### 3.4

**(thinking interruption)**

가

가

Rudolph    Reppenng    Mandler    Interruption

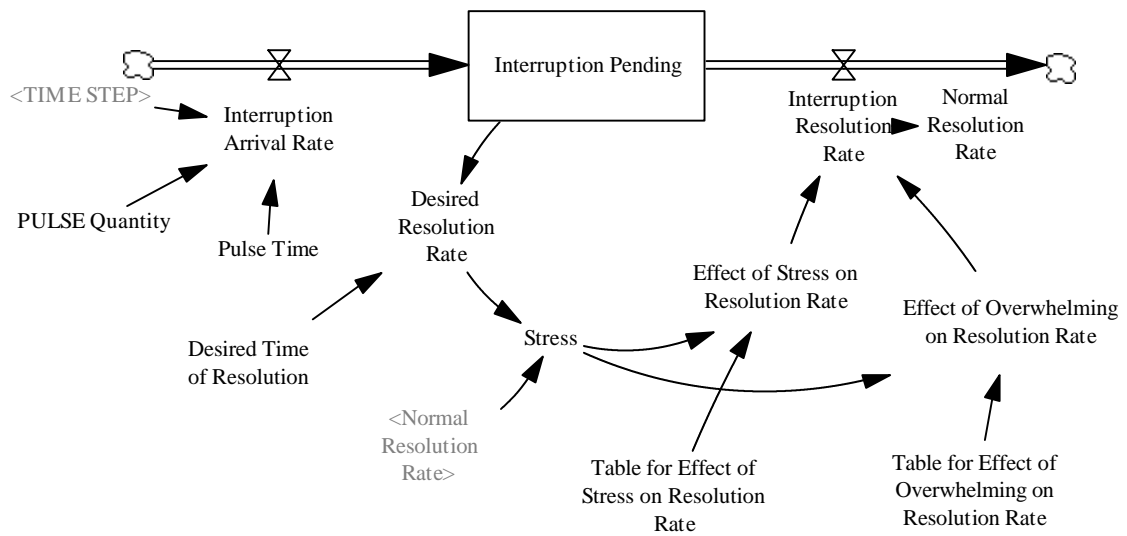
interruption) 가 (stress) (thinking Interruption “

(Rudolph and Reppenning (2000)).

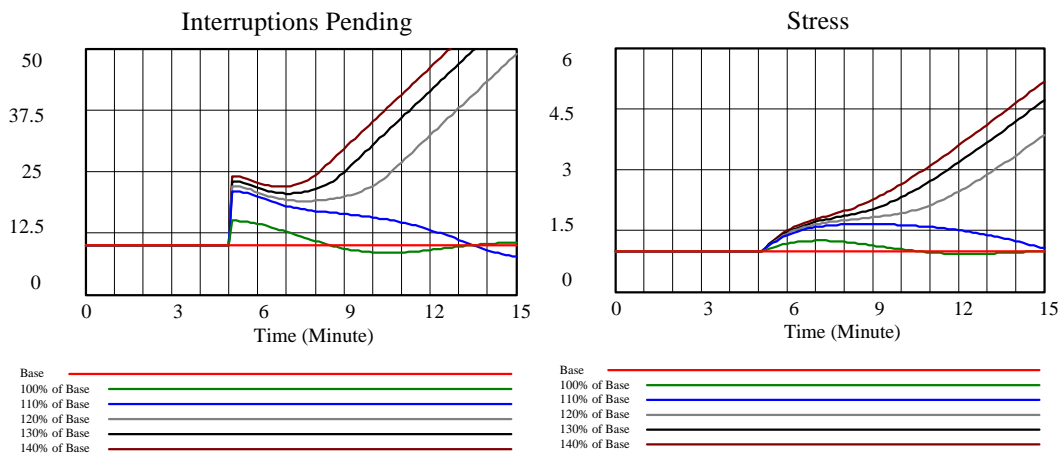
< 1> Interruption Stock and Flow Diagram , < 2> (simulation)

1.1 (110%)

(workload)가 (interruption pending) (stress) 가



< 1> Interruption (Rudolph and Reppenning (2000))



< 2> Interruption (Rudolph and Reppenning (2000))

## 4.

### 4.1

Jay Forrester (system dynamics) 1960 MIT Sloan School  
가 (Feedback) , 2) . 1) . 3)

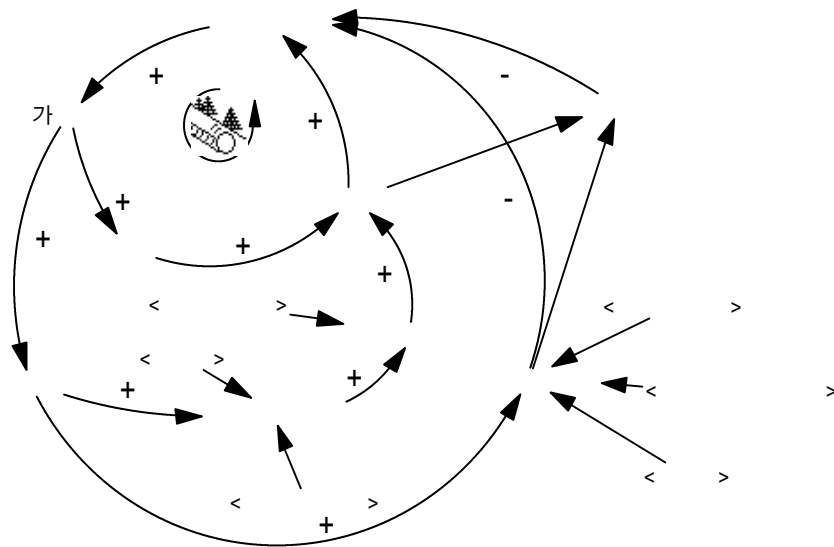
### 4.2 (interview)

가  
, 2000 12 1.2  
가 Causal Loop Diagram  
, 2001 3 12 Causal Loop Diagram

### 4.3

#### 4.3.1 ( 3)

가

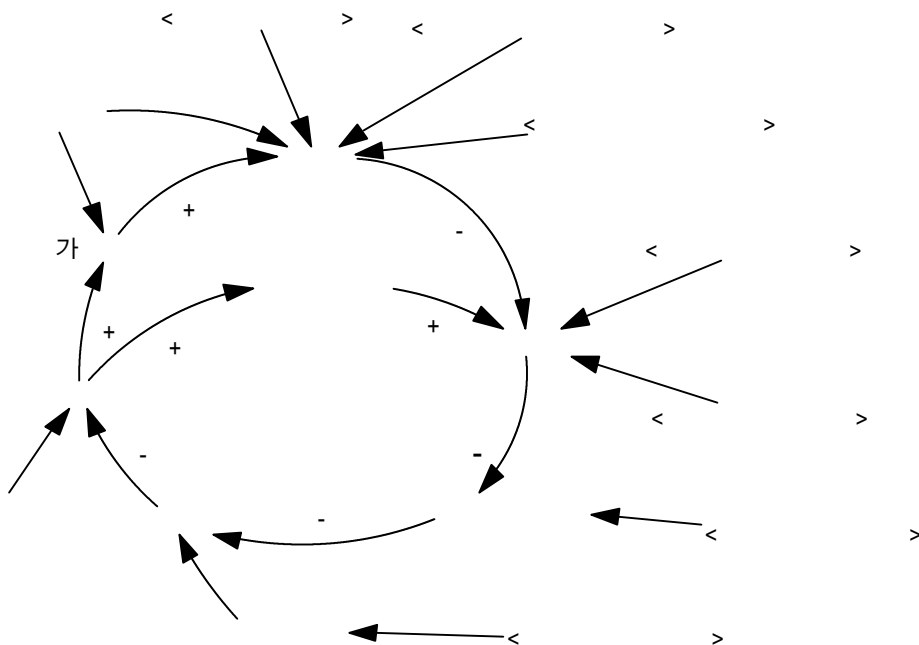


< 3 >

CLD

4.3.2

( 4 )



< 4 >

CLD



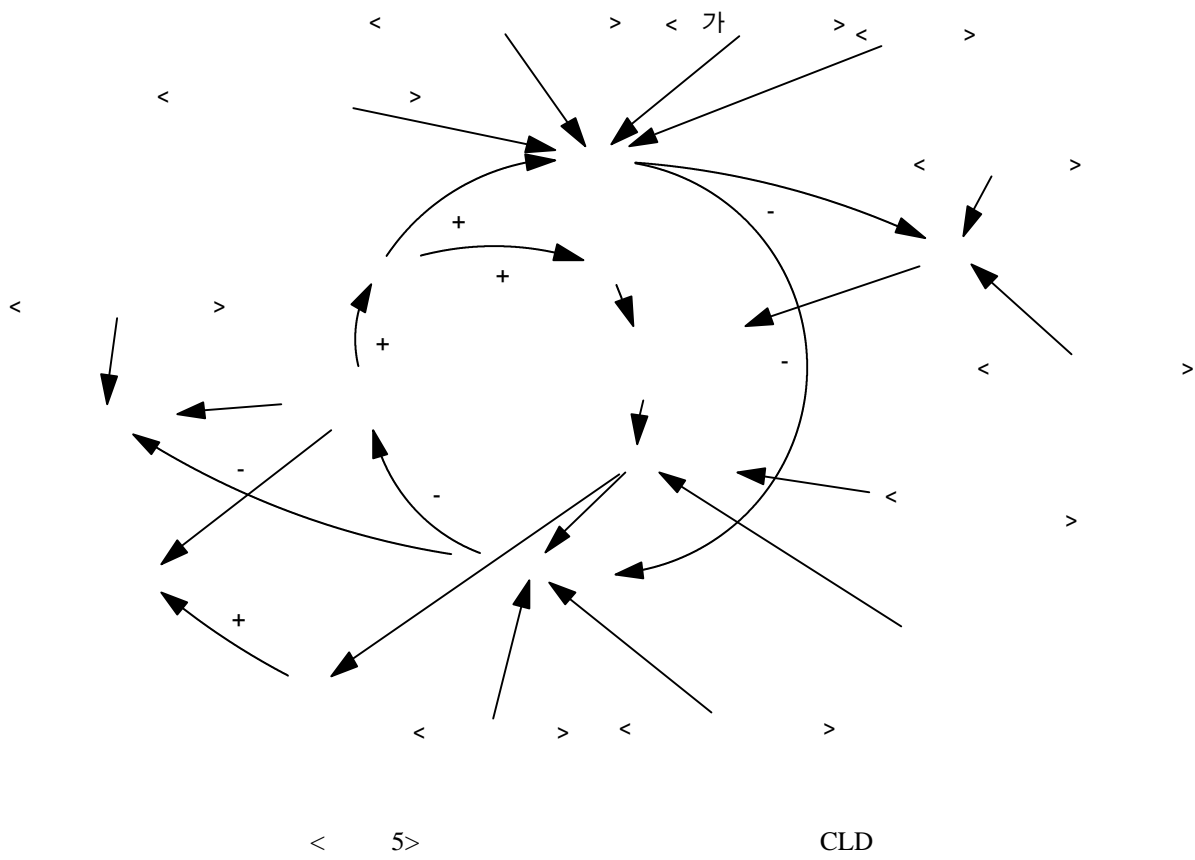
가 가

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가 가

4.3.3

( 5 )

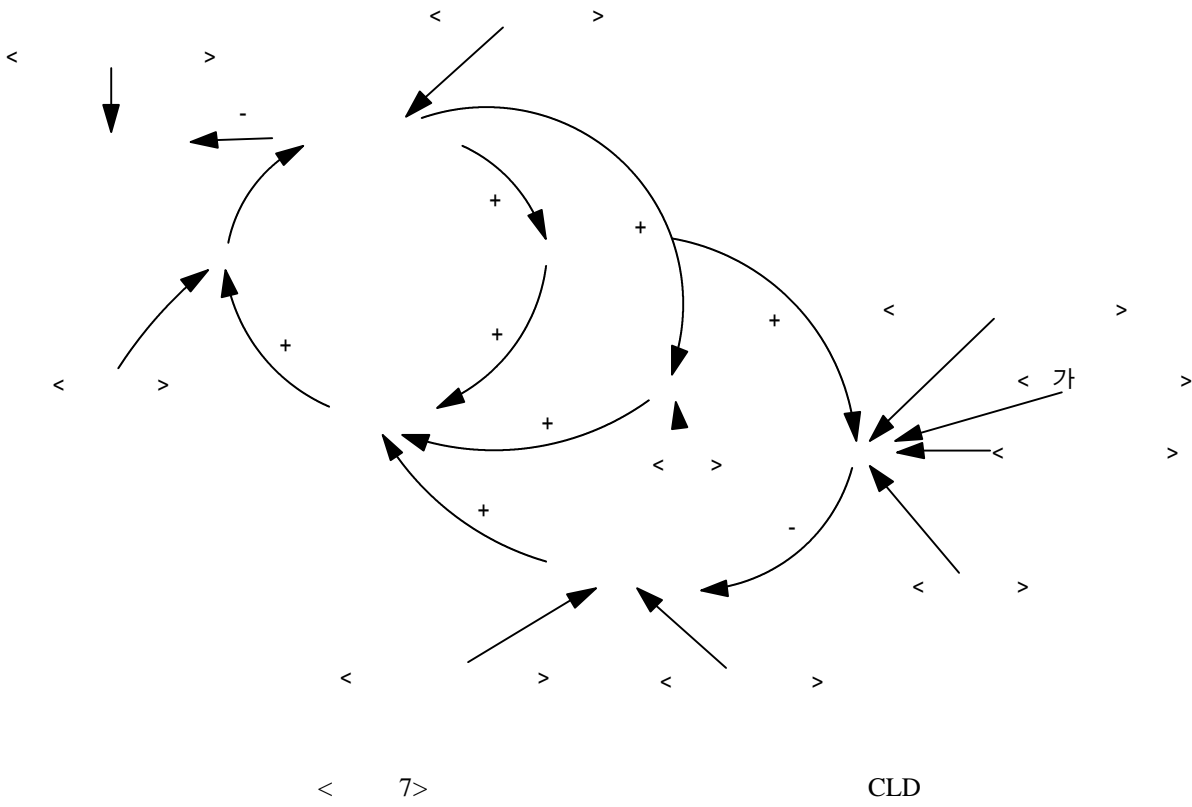


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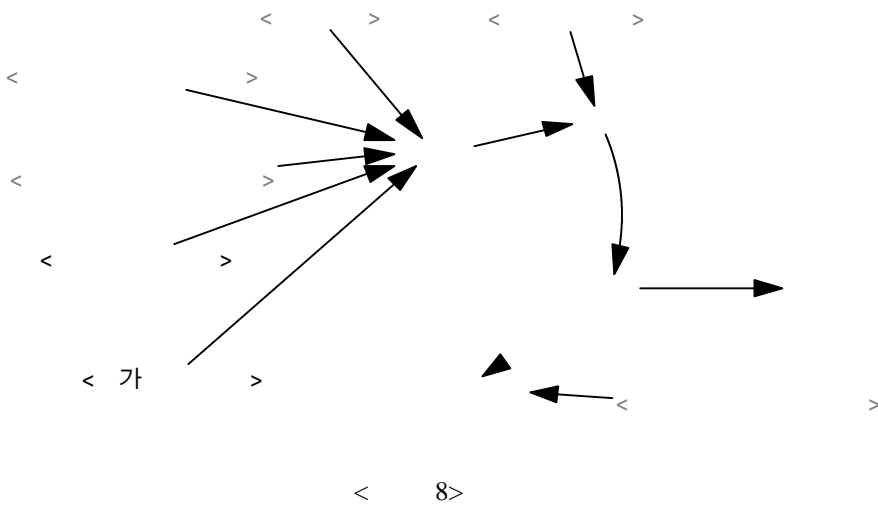




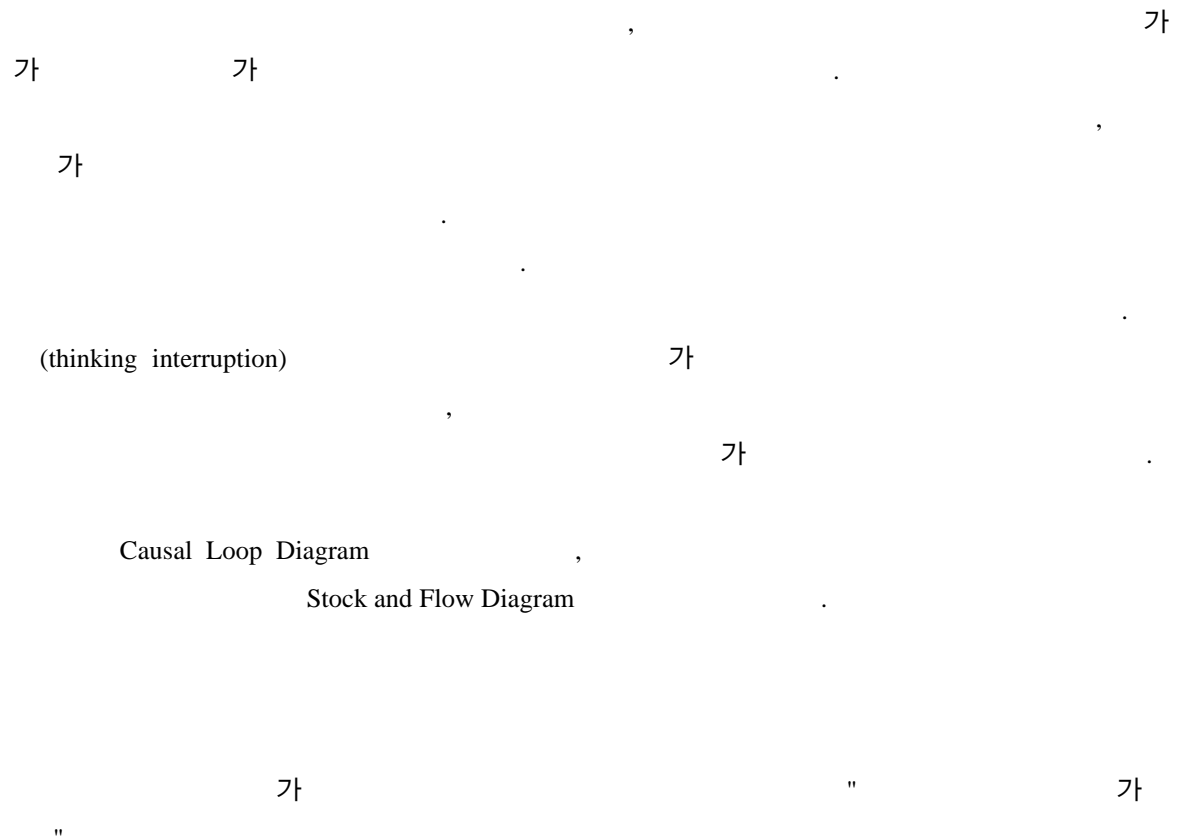
4.3.6

( 8 )

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## 5.



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