

RELAP5/CANDU+

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Evaluation on Operation of Liquid Relief Valves  
for Steam Line Break Accidents  
by RELAP5/CANDU+ Code

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RELAP5/CANDU+ 가

RELAP5/CANDU+

가

2/3/4

2/3/4

FSAR

가

가가

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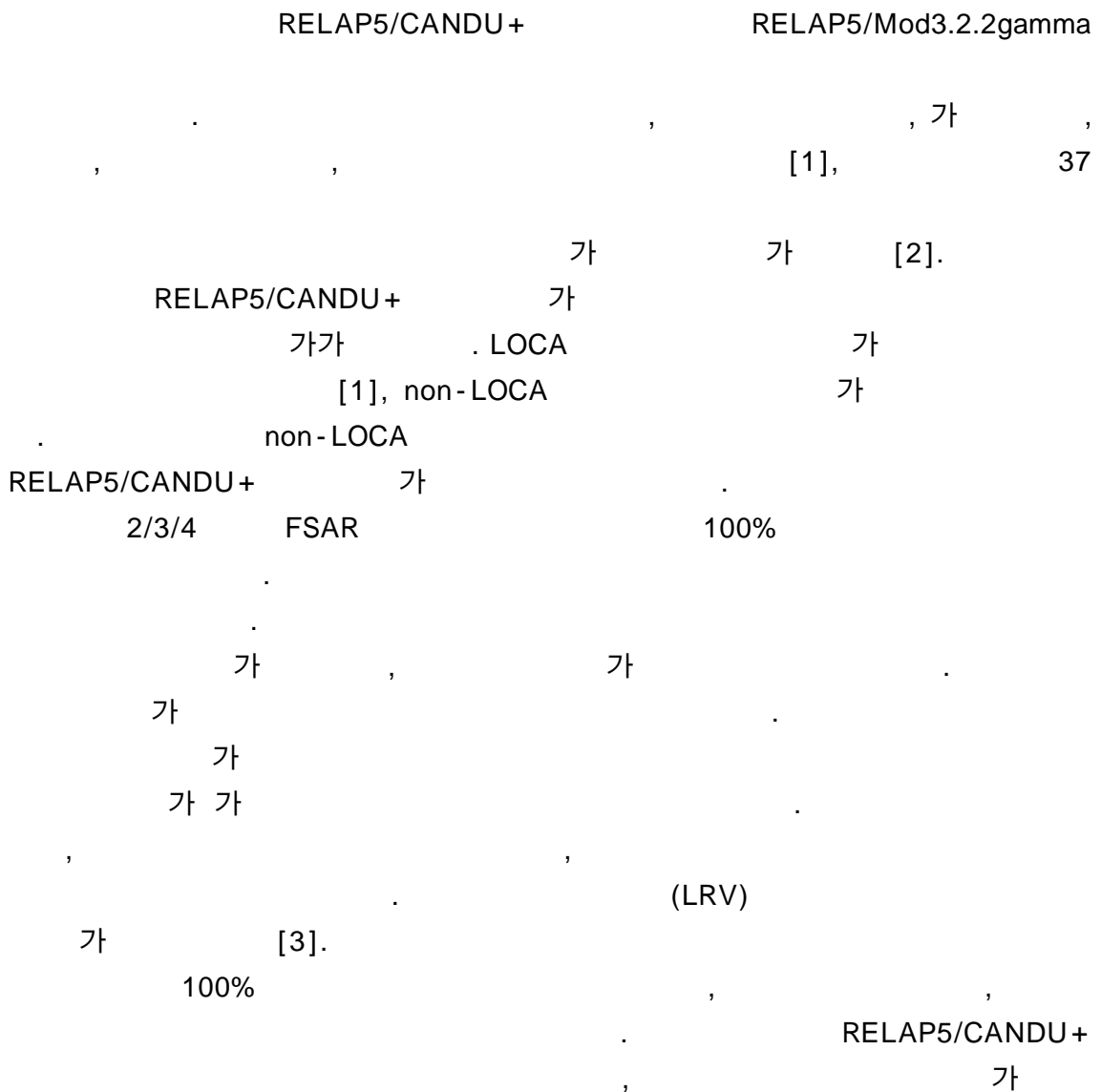
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Abstract

A development of RELAP5/CANDU+ code for regulatory audits of accident analysis of CANDU nuclear power plants is on progress. This paper is undertaken in a procedure of a verification and validation for RELAP5/CANDU+ code by analyzing main steam line break accidents of WS 2/3/4. Following the ECC injection in sequence of the steam line breaks, the mismatch in heat transfer between the primary and the secondary systems makes pressure of the primary system instantly peaked to the open setpoint of liquid relief valves. The

event sequence follows the result of WS 2/3/4 FSAR, but there is a difference in pressure transient after ECC injection. Sensitivity analysis for main factors dependent on the peak pressure such as control logics of liquid relief valves, ECC flow path and feedwater flow is performed. Because the pressure increase is continued for a long time and its peaking is high, open and close of the liquid relief valves are repeated several times, which is obviously different from those of WS 2/3/4 FSAR. As a result, it is evaluated that conservative modeling for the above variables is required in the analysis.

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RELAP5/CANDU+ RELAP5 2/3/4 FSAR  
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RELAP5 ,  
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RELAP5/CANDU+  
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2. 2/3/4

RELAP5/CANDU+ 2/3/4  
(Nodalization) FSAR CATHENA  
Nodalization [4].  
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5.25MPa 'LOCA Signal' , 600  
'LOCA+Conditional Signal' 가 .  
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2/3/4 FSAR  
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10.34MPa 10.01MPa  
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3.

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RELAP5, RELAP5/CANDU+      CATHENA      2/3/4 FSAR  
 100%      가      1~2  
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	RELAP5 ( )	2/3/4 FSAR ( )	RELAP5/CANDU+ ( )
	0	0	0
	14	30	14
LOCA Signal	51	64	51
	651	664	651
	~1310	~960	~1270

1      가

RELAP5    CATHENA

RELAP5

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Trip Valve

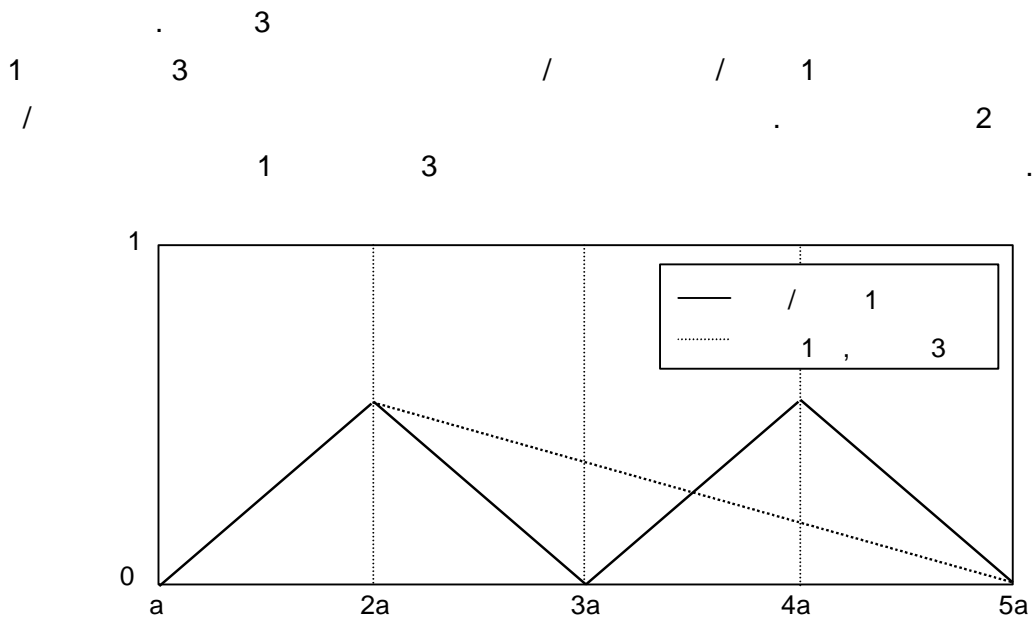
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RELAP5/CANDU+

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RELAP5/CANDU+ CATHENA

RELAP5/CANDU+

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RELAP5/CANDU+ non-LOCA

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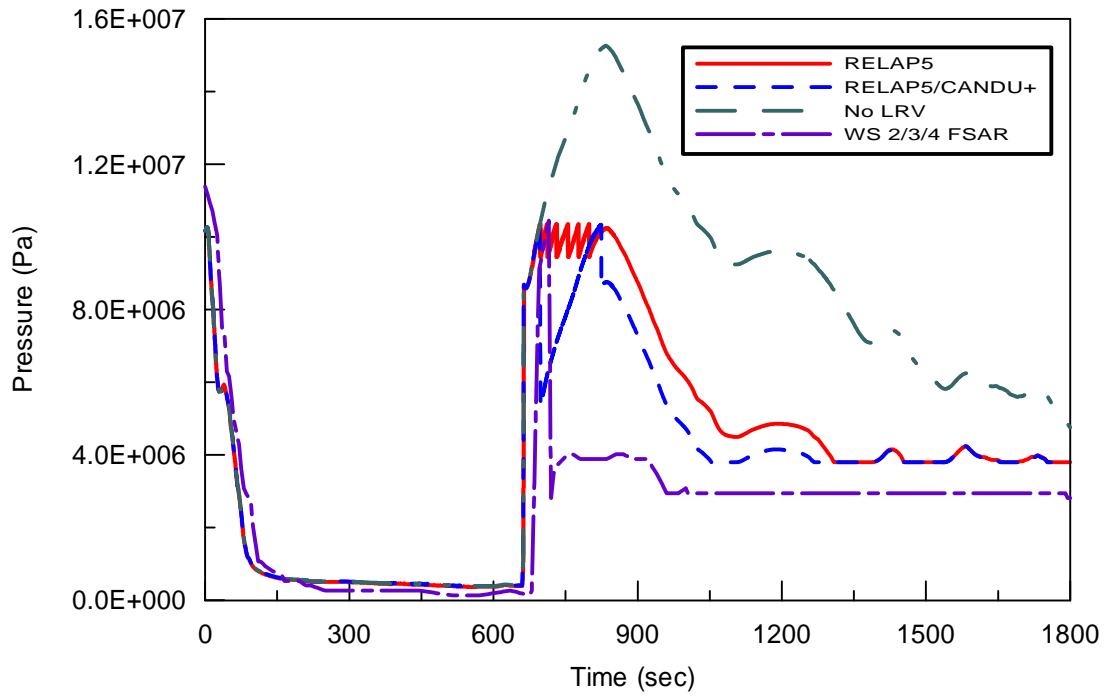


Fig. 2 Outlet Header Pressure of Loop 2

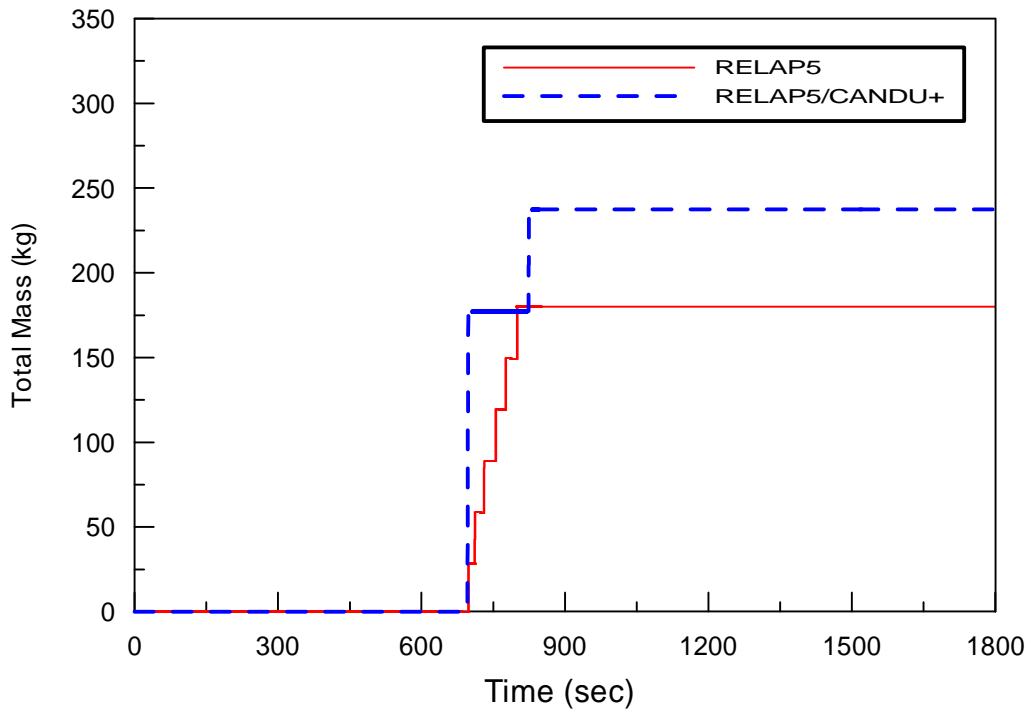


Fig.3 LRV Total Flow