

IHTS

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Structural Integrity Evaluation of IHTS Piping Carrying Lead Coolant for Dead Weight

150

가 가

KALIMER-150 IHTS

KALIMER-150

Abstract

As a candidate idea on conceptual study of liquid metal reactor (LMR), the feasibility of using lead coolant, having chemical stability with water, for IHTS piping is investigated. Structural integrity evaluation of KALIMER-150 IHTS piping carrying lead coolant is performed by calculating the piping deflections, stresses for dead weight, and natural frequencies. The calculation results show that the use of lead coolant in the IHTS piping cannot guarantee the structural integrity of the piping to carry heavy weight lead coolant.

1.

KALIMER-150

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[1].

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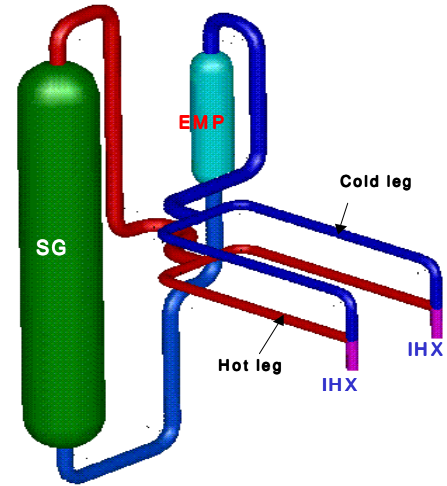
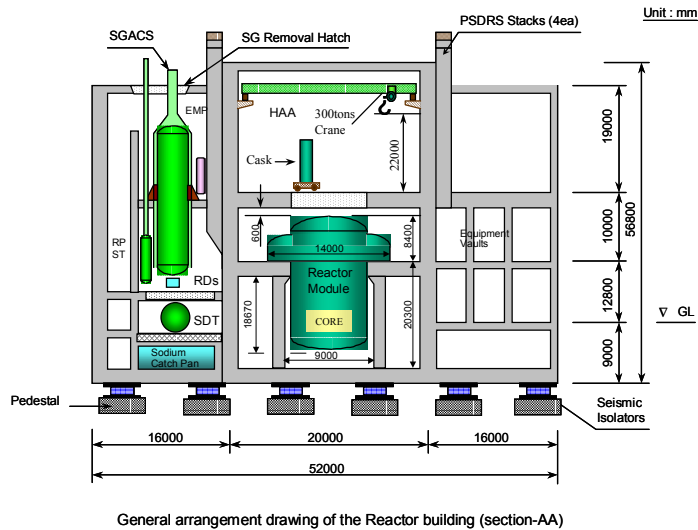
가 520°C

가

(Hot leg)

ANSYS

[3].



1. KALIMER

1. KALIMER

		Design Features of KALIMER-150
Large Piping (Hot Leg/Cold Leg)	O.D Thickness Pipe spec. Radius of curvature Material	50.8 cm 0.9525 cm 20"SCH20 76.2 cm 316SS
Small Piping (Hot Leg/Cold Leg)	O.D Thickness Pipe spec. Radius of curvature Material	35.56 cm 0.7925 cm 14"SCH20 53.34 cm 316SS
SG	O.D Height No.	2.8 m 15.6 m 2 EA
Horizontal distance of IHX-SG		11.5 m

2.

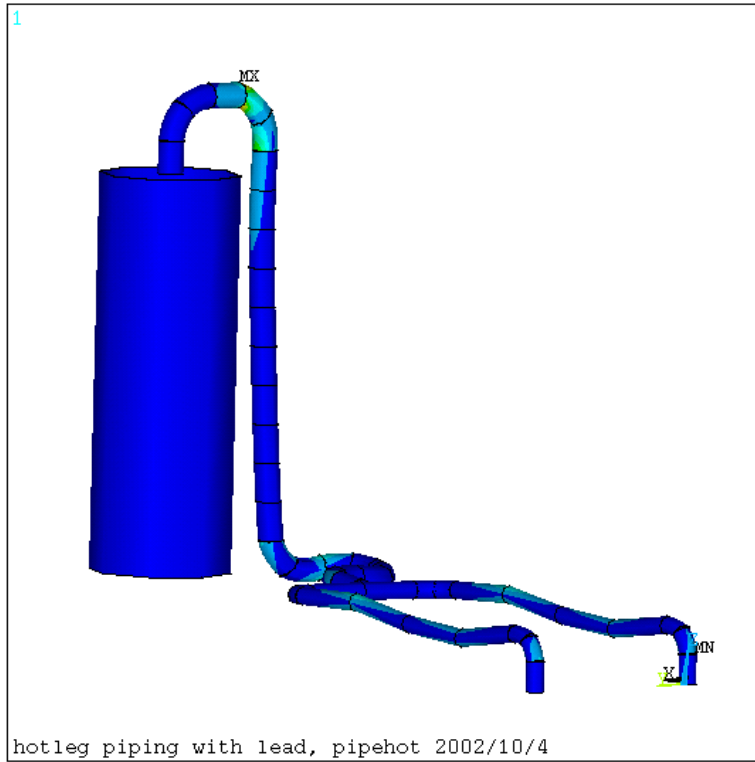
2
L / 가 11.5m x 9.4m
8m , 3m 9.4m
[2]. 1 50.8cm
0.9525cm , 35.56cm , 0.7925cm
S.S.316 195GPa, 7840kg/m³, 0.3,
15.3 x 10⁻⁶ m/m⁰C , 172Mpa [4]. 530°C
가 156GPa, 0.29, 18.4 x 10⁻⁶ m/m⁰C ,
86Mpa . 500°C 10,510kg/m³ .

3.

ANSYS , 2
3 PIPE16 ,
PIPE18 ,
1 66 , 47
0.85m 0.6m
3 , Hanger 3 , Snubber 3
3 , 8 , 2
2
(D) 16.7 13.7 가

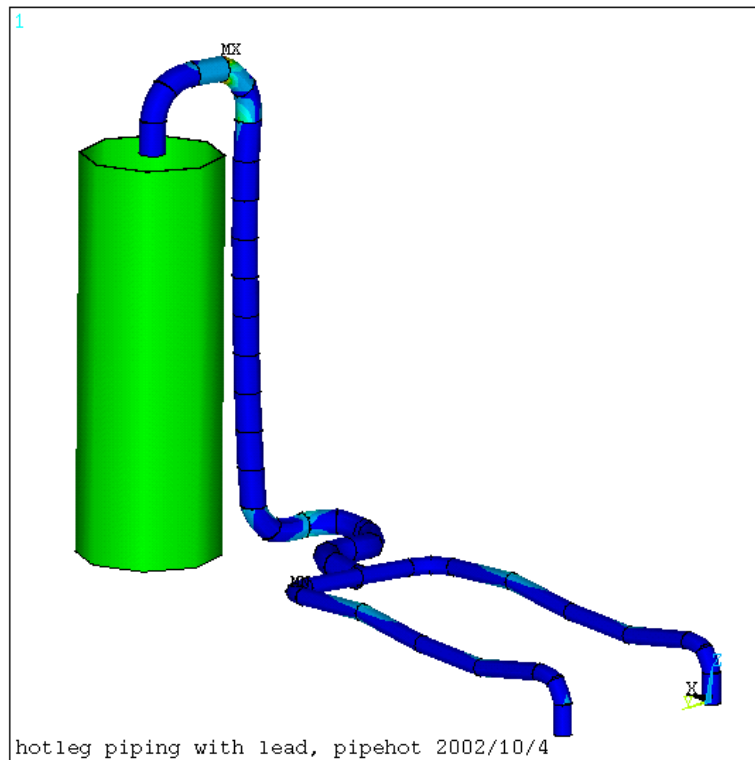
4.

59.1 , 8.35
4.1 ,
0.6mm 4.1mm 2 4.5
4.5 38 17.7Mpa 120.5MPa



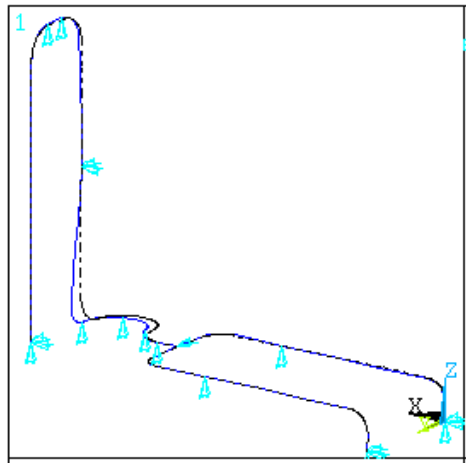
4.

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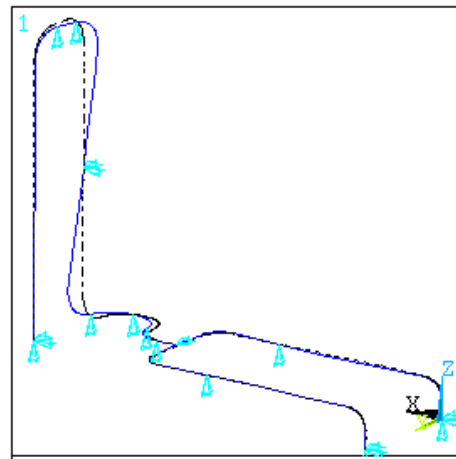


5.

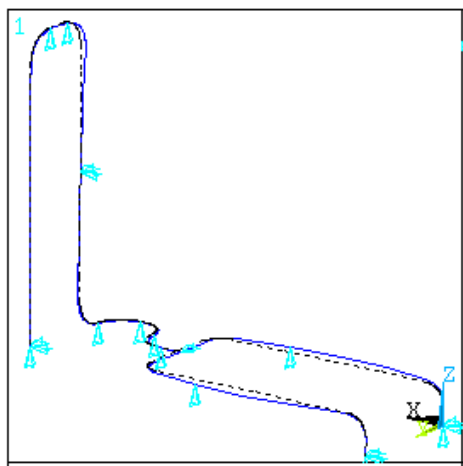
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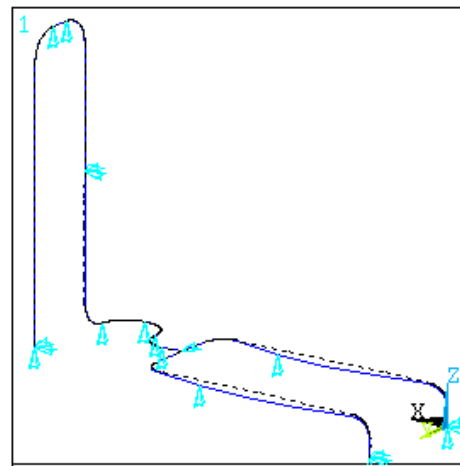
(3.14 Hz)



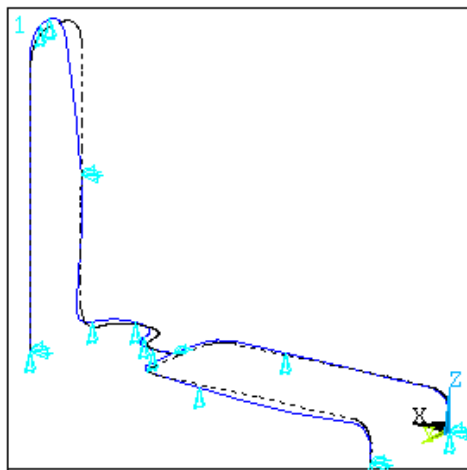
(3.40Hz)



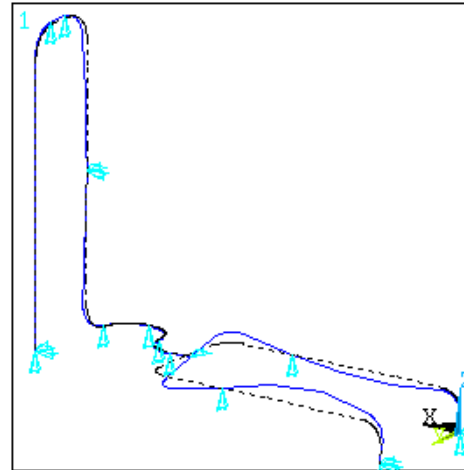
(4.97 Hz)



(5.31Hz)



(6.22 Hz)



(8.02Hz)

6.

(1-6)