

KALIMER-600

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Structural Concept Design of KALIMER-600 Sodium Cooled Fast Reactor

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Key Words: SFR(), KALIMER-600, Mechanical Structure Design()

Abstract

KALIMER-600 is a sodium cooled fast reactor with a fast spectrum neutron reactor core. The NSSS design has three heat transport systems of a PHTS (Primary Heat Transport System), a IHTS (Intermediate Heat Transport System) and a SGS (Steam Generation System). PHTS is a pool type and has a large amount of sodium in the pool. The mechanical design targets are maintaining the enough structural integrity for a seismic load of SSE 0.3g and the thermal and mechanical loads by the high temperature environments and an economical competitiveness when compared with other reactor types.

SFR) 1. (Sodium-cooled Fast Reactor, 1 2 (Intermediate Heat Transport System, IHTS) . 1 (IHX), 1 ,

4 (Gen IV)

[1].

KALIMER-600

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500°C

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Fig.1

[2,3,4]. Table 1

2

1

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Table 1 Key Design Features of KALIMER-600

전기출력	600 MWe
열전달 계통	2-루프 IHTS / SGS
원자로 수명	60년
원자로형	풀형 소듐냉각 고속로
핵연료 종류	금속 U-TRU-Zr
지진설계	SSE 0.3g, 면진

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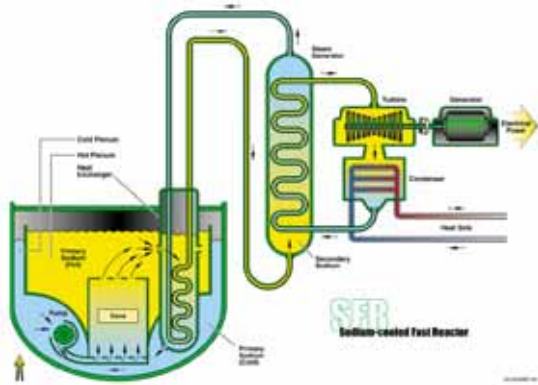


Fig.1 Pool type Sodium-cooled Fast Reactor[5]

KALIMER-600

Fig.3
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2.

2.1

500°C

1
가

SFR

가
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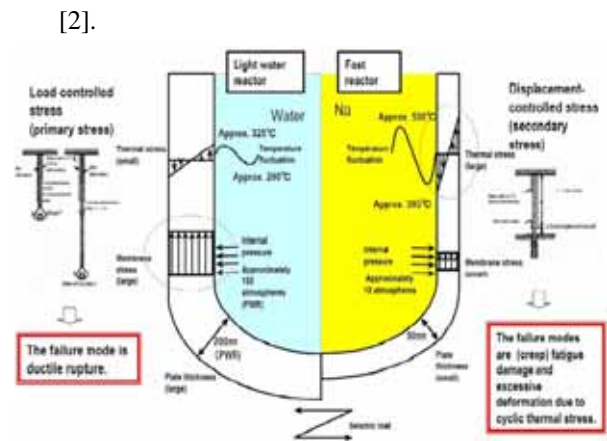


Fig.2 Structural Features of SFR and PWR[5]

Fig.2

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Fig.3

KALIMER-600

[2]. Table 2

316SS

Mod.9Cr-1Mo

(Upper Internal Structure, UIS)

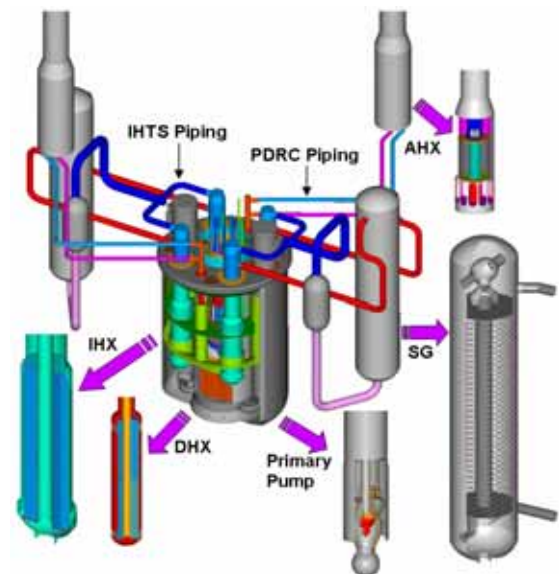


Fig.3 KALIMER-600 Reactor Concept Drawing

Table 2 Dimensions of Reactor Structures

Components	Diameter (m)	Height (m)	Weight (tons)
Reactor Vessel	11.41	18	275
Containment Vessel	11.76	18.35	137
Reactor Baffle	11.26	6.45	110
Support Barrel	5.81	11.5	65
Inlet Plenum	5.91	1.4	72
Core Support Structure	5.9 - 6.2	0.5	25
Upper Internal Structure	3.1	10.2	23
Reactor Head	11.76	0.5	239
IHX	2.4	7.9	30
Primary Sodium Pump	2.4	17	110

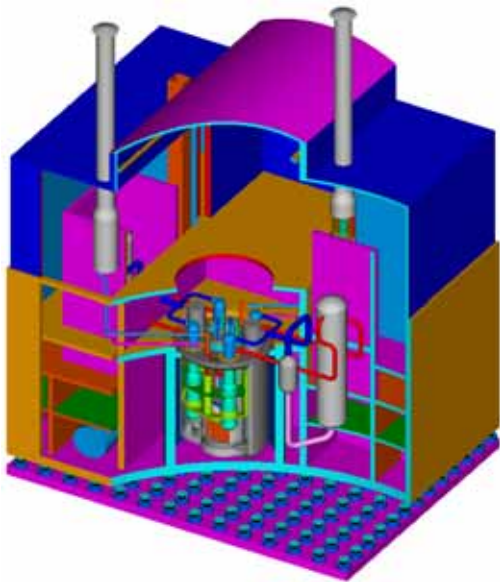


Fig.4 Reactor Building of KALIMER-600

KALIMER-600 49m × 36m, 54m, 5 Fig.4

(Passive Reactor Vault Cooling System)

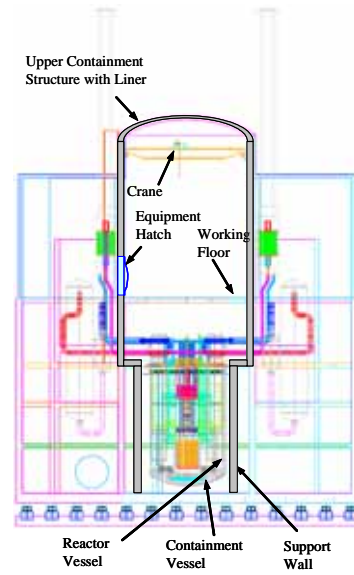


Fig.5 Schematic Drawing of Containments

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KALIMER-600

2

KALIMER-600 2

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(LRP)

(SRP)

5.3m, 3.9m

0.775m

가 Fig.5 KALIMER-600

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