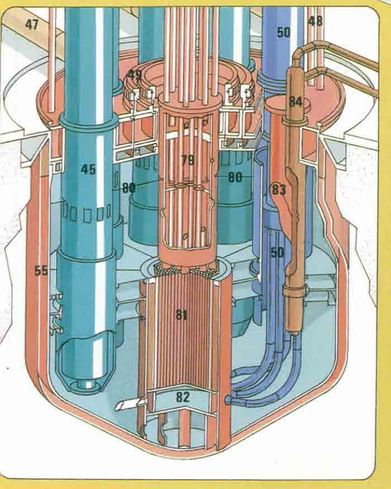
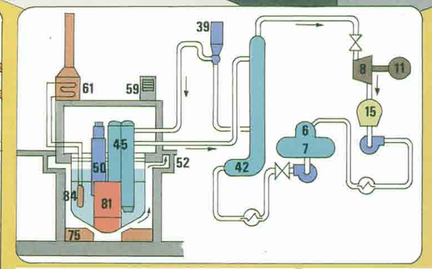
SAFR

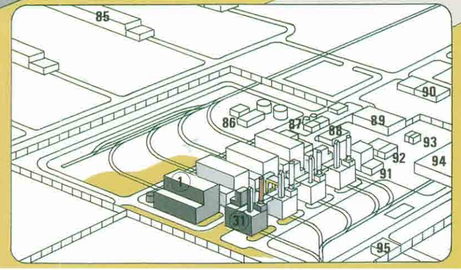
A naturally safe, low cost, liquid metal reactor

The Sodium Advanced Fast Reactor (SAFR) is designed by Rockwell International with major support from Combustion Engineering, Bechtel and Argonne National Laboratory

The world's reactors No 91







DESIGN DATA

Electrical power generation	
Gross electrical output, MWe	377
Terminal voltage, V	22 000
Frequency, Hz	60
Gross reactor thermal power, MWt	900
Minimum overall breeding ratio	>1
Heat transport system	
Configuration	Pool
Coolant fluid	Sodium
Coolant purity requirement	
Overall (Na+K), per cent	99.90
Calcium, ppm	10
Number of primary components	2 pumps, 4 intermediate heat exchangers
Number of intermediate loops	2
Plant design life, years	60
Overall plant availability, per cent	80

KEY

1. Turbine building
2. Air intake hood
3. Power roof ventilator
4. Air handling unit
5. Turbine building overhead crane
6. Deaerator heater
7. Deaerator storage tank
8. High pressure turbine
9. Intermediate pressure turbine
10. Low pressure turbine
11. Generator
12. Exciter
13. Moisture separator
14. Low pressure feedwater heaters
15. Condenser
16. Reheater drain tanks
17. Bus duct
18. Isolation transformer
19. Control panel
20. Booster feedwater pump
21. Motor driven feedwater pump
22. High pressure feedwater heater
23. Condensate storage tank
24. Battery room
25. 125V dc switchgear
26. Acid feed pumps and tanks
27. Carbon bed tanks
28. Mixed bed tanks
29. 13.8kV switchgear
30. 480V load centre
31. Reactor building
32. Reactor containment building/reactor service building filter
33. Reactor service building heating, ventilation and air conditioning
34. Electrical panel
35. Primary pump motor controller
36. Sodium water reaction products system/intermediate heat transport system
37. Intermediate heat transport system pump motor controller
38. Intermediate heat transport system purification system
39. Intermediate heat transport system pump
40. Lubrication oil cooling unit
41. Expansion tank
42. Steam generator
43. Containment unit cooler
44. In vessel transfer machine drive tower
45. Intermediate heat exchanger
46. Return from steam generator
47. Feed to steam generator
48. Closure cooling air exhaust stacks
49. Double rotating plugs
50. Primary pumps
51. Reactor vessel support structure
52. Reactor air cooling system exhaust air collection header
53. Shielding
54. Insulation
55. Reactor vessel
56. Reactor air cooling system exhaust air duct
57. Gantry crane
58. Spent fuel cooling exhaust duct
59. Reactor air cooling system exhaust air stack
60. Natural draught heat exchanger stack
61. Natural draught heat exchanger
62. Expansion tank
63. Forced draught heat exchanger
64. Forced draught fan
65. Manipulator
66. Fuel handling machine
67. Fuel transfer swinging arm
68. Fuel transfer tube
69. Delayed neutron monitoring system
70. Fuel transfer cell
71. Spent fuel cooling exhaust duct
72. In vessel fuel handling machine
73. In vessel fuel storage basket
74. Reactor fuel transfer tube
75. Reactor air cooling system air duct
76. Spent fuel shipping cask
77. Compressors
78. Roll up door
79. Upper internals structure
80. Sodium level
81. Reactor core
82. Inlet plenum
83. Primary cold trap
84. Direct reactor heat exchanger
85. Cooling tower
86. Sewage treatment building
87. Water treatment building
88. Service buildings
89. Warehouse
90. Administration and training building
91. Plant service building
92. Engineered safety facility
93. Gas turbine building
94. Fuel cycle facility
95. Guard house

Nuclear Engineering International, November 1986

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