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SE

Distribution
U. S. Department of Energy

Order No
A.107523

ABSTRACT

This report provides a listing of the reports and results generated by Westinghouse under the contract DE-FC07-03ID14465, “Generation IV Supercritical Water Reactor”.

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1. **OVERVIEW OF TASKS**

The work results summarized in this report have been developed according to plans described in References [1] and [3].

Formal Progress Reports have been provided in References [4] through [12].

2. **REVIEW OF DESIGN BASES AND REQUIREMENTS ON SAFETY SYSTEMS AND CONTAINMENT**

This is reported in Reference [7]. The general design criteria and safety requirements are specified for the SCWR in order to provide a basis for the design of the safety systems and the containment. A combination of the most stringent requirements applied today is used. A key requirement that should be clarified further is the accommodation of core melt accidents in the safety requirements and the design criteria for the SCWR plant. On the basis of comparisons to modern BWR designs a number of possible safety system designs are identified and evaluated. The conclusion is that the major near term efforts should be put on the design of core cooling systems mitigating the effects of loss of core flow transients and loss of coolant accidents. The first layout of the containment is described. There is a major impact from the requirements put on mitigation of core melt accidents.

3. **GENERAL DESIGN CRITERIA AND SAFETY REQUIREMENT**

Design criteria and safety requirements were discussed in Reference [7]. A summary review of the design bases for a SCWR were provided in Reference [1].

4. **CONTAINMENT DESIGN**

The containment design was described in Reference [9]. The design bases were also provided in the report.

Calculations of the behaviour of the containment during accident conditions were provided in Reference [10]. These results have been further elaborated on in Reference [15]. The conclusion is that the containment design should not be an issue for the SCWR provided that sufficient space can be allowed for safety systems and passive behaviour of the containment.

5. **DESIGN OF SAFETY SYSTEM**

The design of the safety systems was discussed in Reference [7]. Specific designs were developed and documented in Reference [9].
6. REFERENCES


[2] Westinghouse STD-CM-546, “Award Number DE-FC07-03ID14465” (incl letter STD-CM-544, which transmits DOE Form 24111.2, and letter STD-CM-545, which transmits the ACH Vendor / Miscellaneous Payment Enrollment Form)

[3] Westinghouse Memo SE 03-075
   "SCWR – Phase 2 - Work Items & Plan"

   "SCWR Contract No. DE-FC07-03ID14465
   Monthly Progress Report June 2003”

   "SCWR Contract No. DE-FC07-03ID14465
   Monthly Progress Report July 2003”

   "SCWR Contract No. DE-FC07-03ID14465
   Monthly Progress Report August 2003”


   "SCWR Contract No. DE-FC07-03ID14465 – Progress Report FY 2003”

   "Generation IV Supercritical Water Reactor - Progress Report First Quarter of FY 2004”


   "Generation IV Supercritical Water Reactor - Progress Report Third Quarter of FY 2004”
 "SCWR – Work Plan for the Period February – March 2004”

 "SCWR- Design Review- General Design Criteria and Safety Requirement”

 "SCWR – Pressure and Temperature in the Reactor Containment During LOCA”