



国家核电
SNPTRD

SNPTRD of
China

R.C. Zhao
H.J. Chang

Corporation
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About SNPTC
About SNPTRD

Main points of
AP1000

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What is
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doing?

State Nuclear Power Technology R & D Center of CHINA

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H.J. Chang

June 11, 2010



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State Nuclear Power Technology Research & Develop Center,
SNPTRD

⇓ *one of ten subsidiaries of* ⇓

State Nuclear Power Technology Corporation, **SNPTC**

SNPTC is a new national corporation of nuclear power plant technology in China.



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What is
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Brief introduction of SNPTC:

- Set up on May.22.2007,
- Financial contributed by:
 - State Council of China: (60%),
 - China National Nuclear Corporation: (10%),
 - China Power Investment Corporation: (10%),
 - China Guangdong Nuclear Corporation: (10%),
 - China National Technical I&E Corporation: (10%).



Targets

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Currently focuses:

- the construction of *AP1000* commercial nuclear power plant (associate with and designed by **WestingHouse**, etc.),
- the research & development of more large power > 1350 MWe passive plant (PWR, similar type as AP1000).



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Brief introduction of SNPTRD:

- Jointly set up by
 - **SNPTC**
 - **Tsinghua University**
- On Oct.24.2008

Cooperate with Tsinghua, Shanghai/Xi'an JiaoTong Univ.



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Purpose & Missions

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- Nonprofit scientific research institution.
- To combine industry with academia and research, and carry out technological research and development of nuclear power.
- Missions:
 - Current:** Projects of AP1000 and CAP1400 (similar type however more higher power output)
 - Future:** Research & Develop of Gen. IV commercial nuclear power plant.



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Typical PWR

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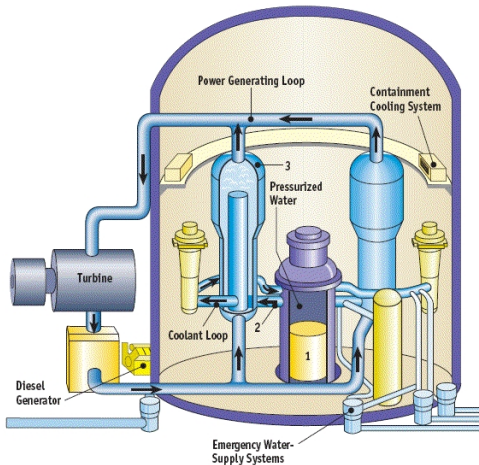
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Veterans ignore the followings, PLS.

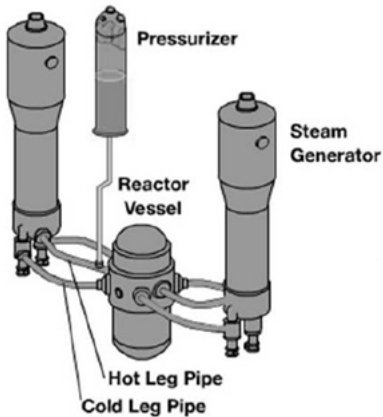




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AP1000 primary loop

Simplify:



Source: U.S. WH

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PCCS of AP1000

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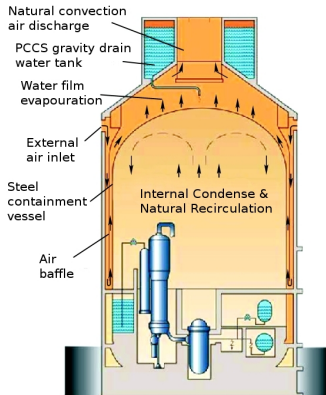
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AP1000 \Rightarrow **PASSIVE** \Rightarrow *Safety system*

The Passive Containment Cooling System (PCCS):



Source: U.S. WH



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PXS of AP1000

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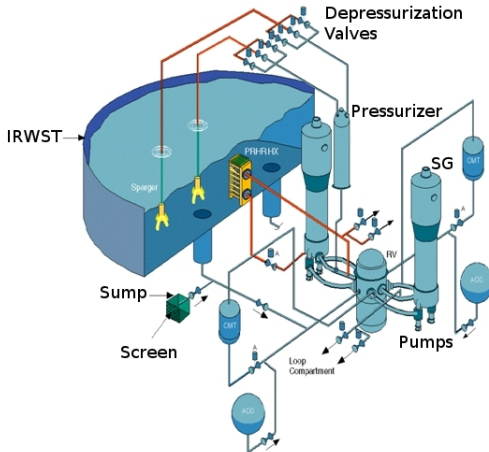
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The Passive Core Cooling System (PXS):



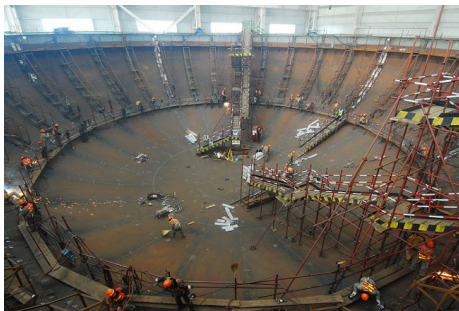
Source: U.S. WH



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Project progress of AP1000

Under constructing: Sanmen ($\times 2$, Zhejiang Prov.)
& Haiyang ($\times 2$, Shandong Prov.)



Lower head of containment.

Source: SNPTC

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Set the position.



Source: SNPTC



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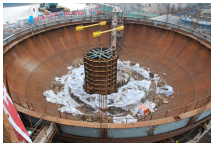
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What is
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Assembling of ring sections & modules.



Source: SNPTC



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Project progress of AP1000

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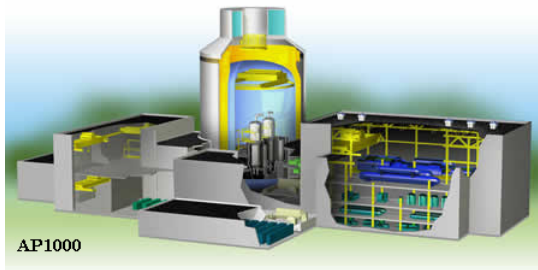
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May.31 in Sanmen#1



Source: [SNPTC](#) & [U.S. Shaw](#)



Business in SNPTRD

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For the “CAP1400” project:

- Design & construct the thermal-hydraulic (T-H) test bed,
- Redesign the In-Vessel Retention (IVR) plan of molten core debris,
- Redesign the steel containment of the plant,
- Softwares developments (*now up to the Software Center of SNPTC*).

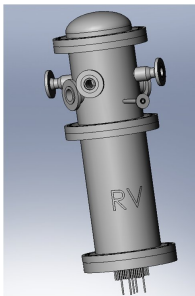


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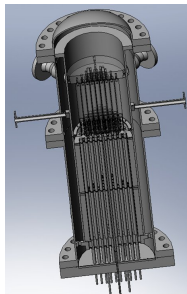
T-H test facility

Reproduction of “APEX” (1:4, Oregon State University) by the software simulation.

Component:



RV integer



RV sectional

Source: SNPTRD



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T-H test facility

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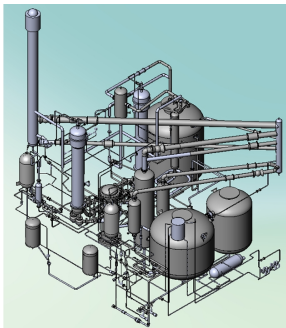
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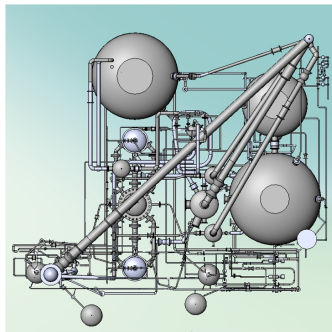
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Entirety:



Principal view



Top view

Source: SNPTRD

A new test facility is under demonstration and design.



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In-Vessel Retention

Redesign the IVR test facilities (with Shanghai Jiaotong Univ.).

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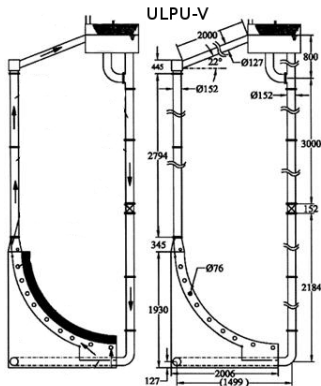
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Source: Theofanous, T.G.



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Future Works

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⇒ GEN. IV.

Source: SNPTC



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That's all

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Thank you for your attention.