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Decided to develop nuclear power

1970

First self-developed and designed PWR unit started to be constructed

1984

Built a batch of NNP units based on the technology introduced from France, Canada and Russia

The end of last century

Via the design, construction and safely operation of the above NNP units, formed the route of nuclear power development based on PWR technology.
By July 2014, there are **20 NNP units** in operation with total installed capability of **18 GW**.

The nuclear power generation of the second quarter of 2014 is **29.386 GWH**, approximately **2.22%** of the total power generation.

In 20th August, one more unit was successfully first connected to grid.

So far, there are **27 units** under construction with total installed capability of **29 GW**.
Overview of Nuclear Power Development in China

Plan of nuclear power development

By 2020
- The total installed capability will reach 58 GW

By 2020
- The total under construction capability will reach 30 GW

- Currently, a number of sites have completed the technical preparation.
- Prepared to start construction recently, to fulfill the need of nuclear power development.
The idea of Nuclear Power Development: To develop nuclear power efficiently on the basis of assured safety

- A batch of AP1000 and CAP1400 NNP units will be constructed
- SFR, HTGR and advanced nuclear fuel cycle technology research
- Joined the ITER project

Nuclear industrial system of thermal neutron reactors, fast neutron reactors and advanced nuclear fuel cycle technology will be established gradually.
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To promote the nuclear power development in a safe and efficient way, in 2006, China decided to introduce AP1000 from the US to build two AP1000 units in Sanmen, Zhejiang and Haiyang, Shandong respectively.
Sanmen Unit 1

- Construction drawing is more than 99% completed.
- Most of the key components of the NI have been installed completely.
- The improved 2-inch lower thrust bearing plate test was completed last week. Westinghouse and EMD’s preliminary conclusion is that the test result is consistent to the expectation.
The Progress in the AP1000 Project

Sanmen Unit 1

- 74 out of 226 turnover packages in NI have been turned over for testing.
- The main control room has been put into service.

Dome Completed  Key components set  Main control room available

Electrical system and I&C system test
The Progress in the AP1000 Project

Sanmen Unit 1
Haiyang Unit 1

Planned to be connected to grid approximately at the end of 2015 respectively.

Sanmen Unit 2
Haiyang Unit 2

Planned to be connected to grid at the end of 2016.

Sanmen1-NI
Haiyang1-NI

2014.08

Sanmen2-NI
Haiyang2-NI

2014.08
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Progress in China’s follow-up AP1000 projects

Via the construction of the AP1000 supporting project

- China has basically established the 3rd generation nuclear power industrial system.
- Built up the complete equipment supplied chain.
- Completed the standard design of localized AP1000.
- Prepared for mass construction of the localized AP1000.
Totally 8 units have been approved by the government, and will start construction recently.
Taohuajiang in Hunan, Pengze in Jiangxi, Xianning in Hubei plan to build 6 units, and have completed the technical preparation of the site.
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The large-scaled advanced pressurized water reactor nuclear power plant

- CAP1400 is one of the sixteen major programs listed in China's plan for scientific and technological development.
- The main goal is to develop large advanced PWR nuclear power technology CAP1400 with independent intellectual property and build the demonstration project.
As the site of the CAP1400 demonstration project, Rongcheng in Shandong plans to build 6 units with 2 units in phase I.
### Progress in China’s CAP1400 Project

### Main technical characteristics of CAP1400

<table>
<thead>
<tr>
<th>Main technical indicators</th>
<th>CAP1400</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDF</td>
<td>$&lt;10^{-6}$</td>
</tr>
<tr>
<td>Availability factor</td>
<td>$&gt;93%$</td>
</tr>
<tr>
<td>Thermal Margin</td>
<td>$&gt;15%$</td>
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<tr>
<td>Thermal Power (Electric power)</td>
<td>4058MWth (1530MWe)</td>
</tr>
<tr>
<td>Response time</td>
<td>72 hours</td>
</tr>
<tr>
<td>Construction cycle</td>
<td>48 months</td>
</tr>
</tbody>
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- CAP1400 fully draws the accumulated 30-year experience of PWR technology R&D, design, construction and safely operation.
- Absorbs the advanced technology of AP1000 and the experience and lessons learned from the first AP1000 units construction in the world.
- Adopts nuclear safety margin enhancement measures based on the Fukushima nuclear accident.
**Progress in China’s CAP1400 Project**

**Design**

- The basic design was completed in 2011 and approved by the government in Jan 2014.
- Construction design has completed more than 67% and satisfied the requirement of starting construction.
Key tests supporting nuclear safety review and design validation have basically completed, the results of the experiments verifies the safety of CAP1400.
The order contracts of 25 long cycle equipments out of 29 have been signed.
The nuclear safety regulator of China has basically finished the safety review of CAP1400, it has fulfilled the technical requirement for construction.
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Overview of SNPTC

The Task

- Introducing the AP1000 3rd generation advanced nuclear power technology.
- Leading the PWR major project of CAP1400.
- Forming China’s proprietary brand of nuclear power technology.
Overview of SNPTC

The mission

- Spearhead nuclear power technology, develop clean energy and mitigate global warming.

The vision

- Striving to build an innovative modern state-owned enterprise boasting leading-edge core technology and representing national nuclear capacity.
Overview of SNPTC

- Technical professionals of SNPTC dominate more than 80%.
- Attained the competence in nuclear power, normal power, equipment and material.
- Gained capability of R&D, design, construction, operation management and full cycle service.
Thank you!