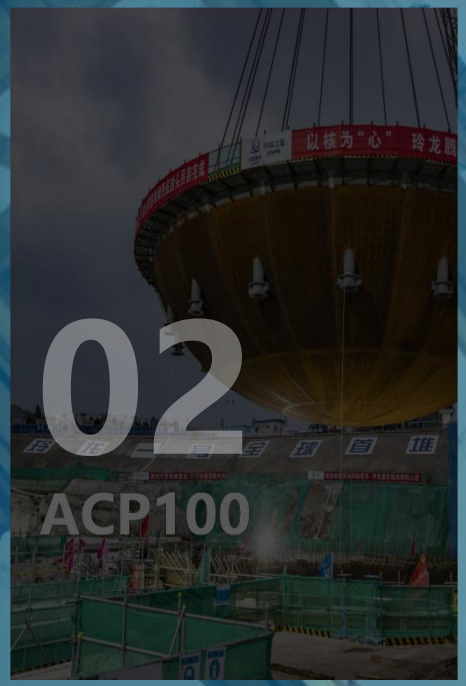
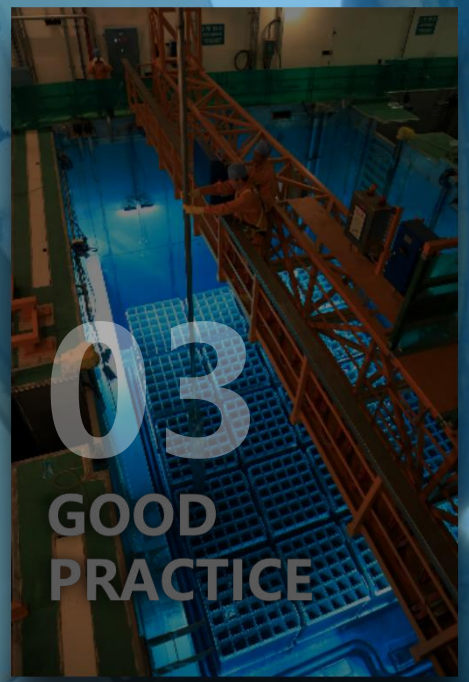

海南核电有限公司
Hainan Nuclear Power Co., Ltd.
中核集团
CNNC
Introduction and project experience of ACP100 (LingLong-1)

海南核电有限公司
Hainan Nuclear Power Co., LTD.
中核集团 CNNC

CONTENT





CNNC

HPR1000 (Hua-long)

A third-generation nuclear power technology unit to which China has exclusive intellectual property rights.

ACP100

A multi-purpose small modular reactor with completely independent innovation of China.

DHR-400 (District Heating)

A low temperature pool type heating reactor which can be used to district heating.

CNNP

20 units under construction

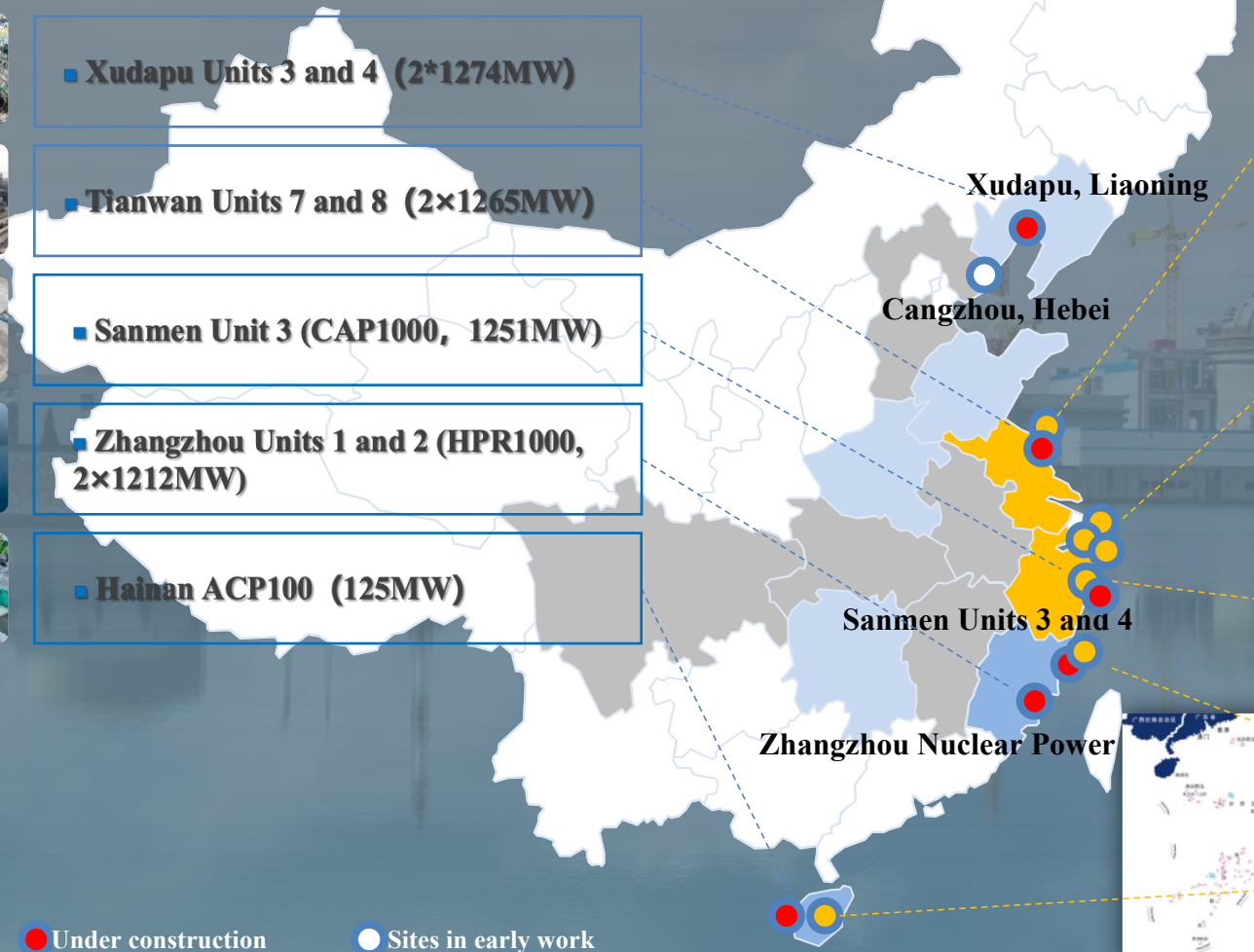
- Xudapu Units 3 and 4 (2*1274MW)

- Tianwan Units 7 and 8 (2×1265MW)

- Sanmen Unit 3 (CAP1000，1251MW)

- Zhangzhou Units 1 and 2 (HPR1000, 2×1212MW)

- Hainan ACP100 (125MW)



26 units in service

- Tianwan Units 1 and 2， 2 ×1060MW
- Tianwan Units 3 and 4， 2 × 1126MW
- Tianwan Units 5 and 6， 2 ×1118MW

- Qinshan 1，350MW
- Fangjiashan， 2 ×1089MW

- Qinshan 2, 1×670MW+1×650MW+2×660MW

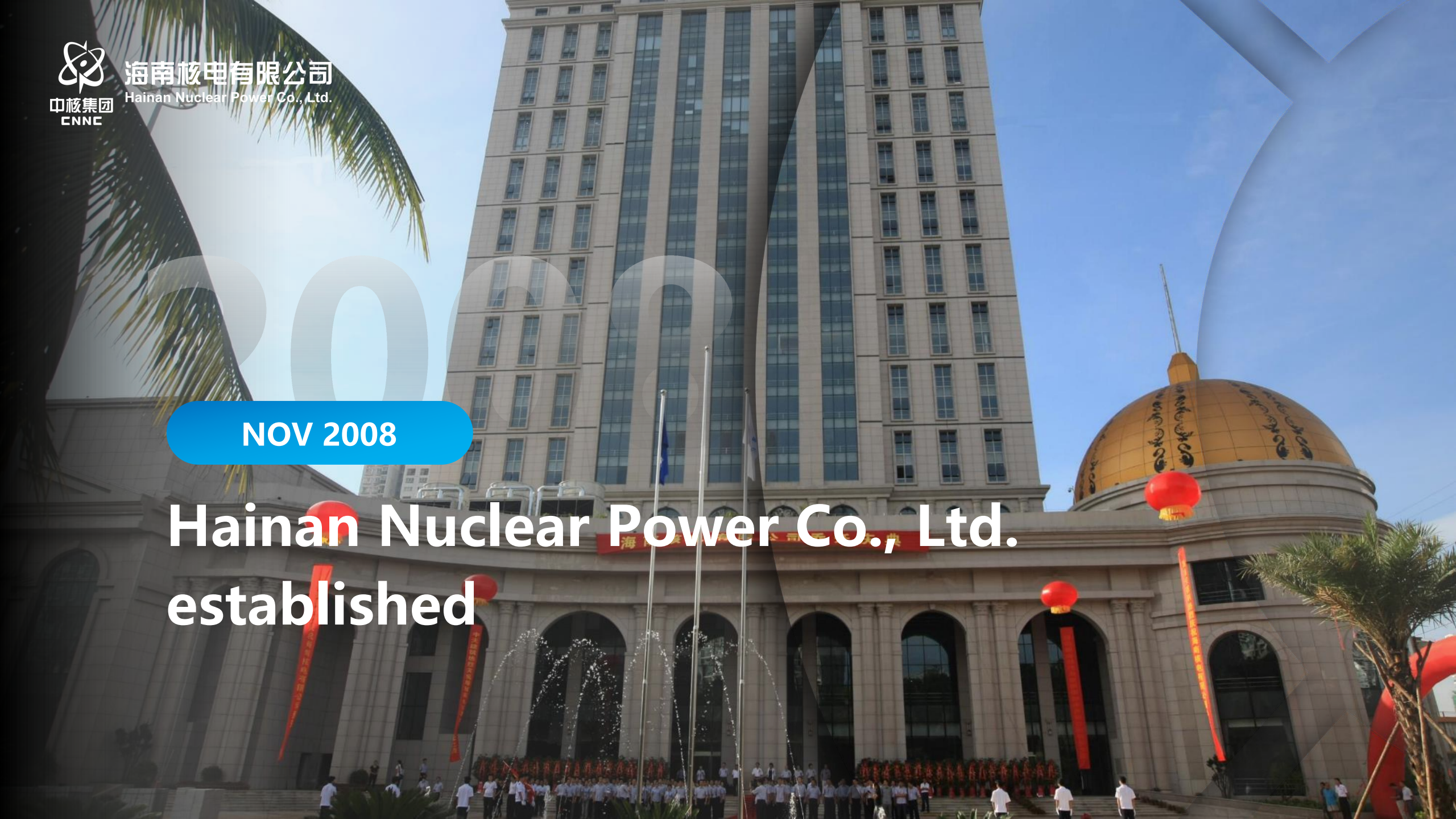
- Qinshan 3，2 ×728MW

- Sanmen Units 1 and 2， 2×1250MW

- Fuqing Units 1 and 2， 2 × 1089MW
- Fuqing Units 3 and 4， 2 × 1089MW
- Fuqing Units 5 and 6， 2× 1161MW

- Hainan Changjiang，2×650MW

In service　Under construction　Sites in early work


中核集团
CNNC
海南核电有限公司
Hainan Nuclear Power Co., Ltd.
2008
NOV 2008
Hainan Nuclear Power Co., Ltd. established


海南核电有限公司
Hainan Nuclear Power Co., Ltd.
中核集团
CNNC
2010
APR 2010
Phase I Project officially commenced construction

中核集团 CNNC

海南核电有限公司
Hainan Nuclear Power Co., Ltd.

AUG 2016

Phase I Project was fully completed and put into operation


中核集团
CNNC
海南核电有限公司
Hainan Nuclear Power Co., Ltd.
MAY 2019
Two units of Phase I Project operating at full capacity

海南核电有限公司
Hainan Nuclear Power Co., Ltd.
中核集团 CNNC

SEP 2020

Two units achieved full marks in WANO indicators

海南核电有限公司
Hainan Nuclear Power Co., Ltd.

JUL 2021

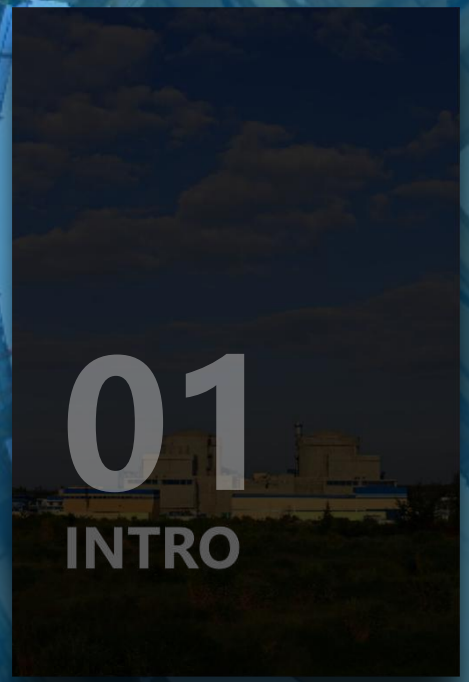
Small Reactor Project officially commenced construction

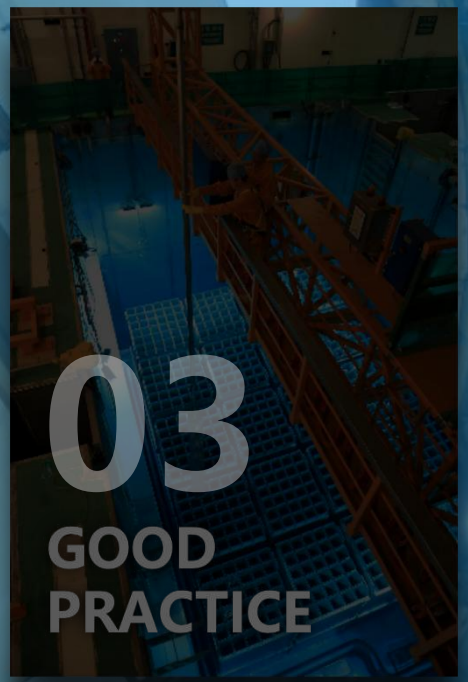
HNPC

Hainan Changjiang Nuclear Power Base has a total installed capacity of 3,825 MW. The first phase has already been completed, comprising two 650 MW units. Currently under construction are the "Linglong One" (ACP100) 125 MW unit and two "Hualong" 1,200 MW units.

海南核电有限公司
Hainan Nuclear Power Co., LTD.
中核集团 CNNC

CONTENT





ACP100

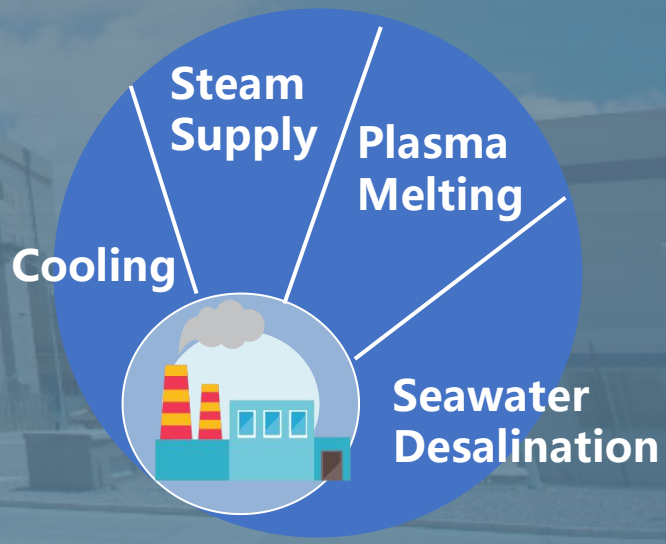
ACP100 has incorporated the advanced design philosophy of third-generation nuclear power technologies, leveraging China's accumulated experience in the design, construction, commissioning, and operation of existing PWR, along with recent achievements in nuclear R&D.

It also aligns with international user requirements for advanced light water reactor plants, meeting third-generation nuclear technology standards.

As an integrated and innovative PWR, it features enhanced compactness, technological advancement, and safety.

Advantage 1	High Safety
Advantage 2	Ideal heat source for Combined Cooling, Heating, and Power
Advantage 3	Adaptable to diverse energy demands
Advantage 4	Highly deployable across multiple scenarios

Multi-Purpose Applications

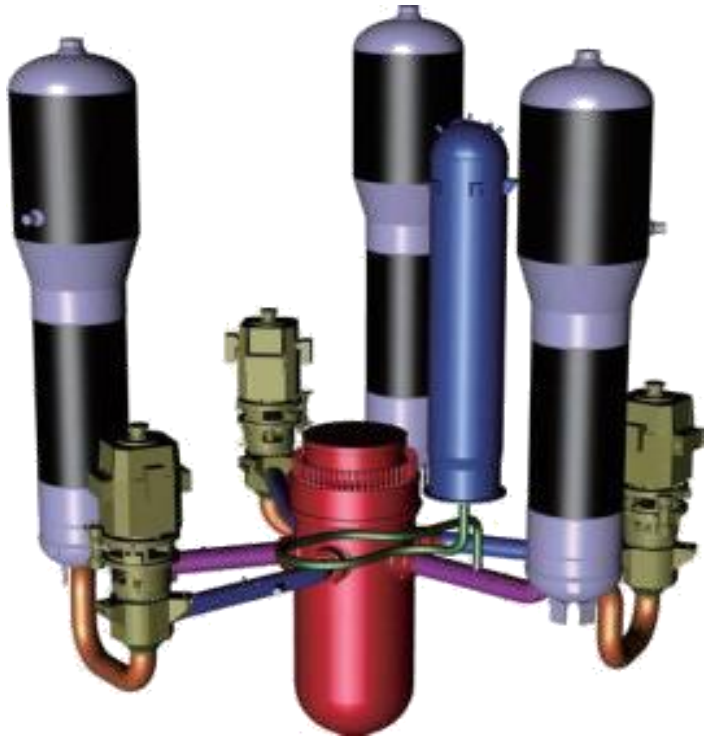


ACP100

No.	Key Technical Parameter	Unit	Value
1	Plant design lifetime	years	60
2	Refueling cycle	months	24
3	Plant availability	%	> 90
4	Rated thermal power	MW	385
5	Rated electrical power	MW	125
6	Average reactor inlet / outlet temperature	℃	303
7	Steam generator outlet rated pressure	MPa (a)	4.5
8	Steam generator outlet rated temperature	℃	293.8
9	Rated steam flow rate	t/h	596.8

ACP100

Traditional vs Innovative



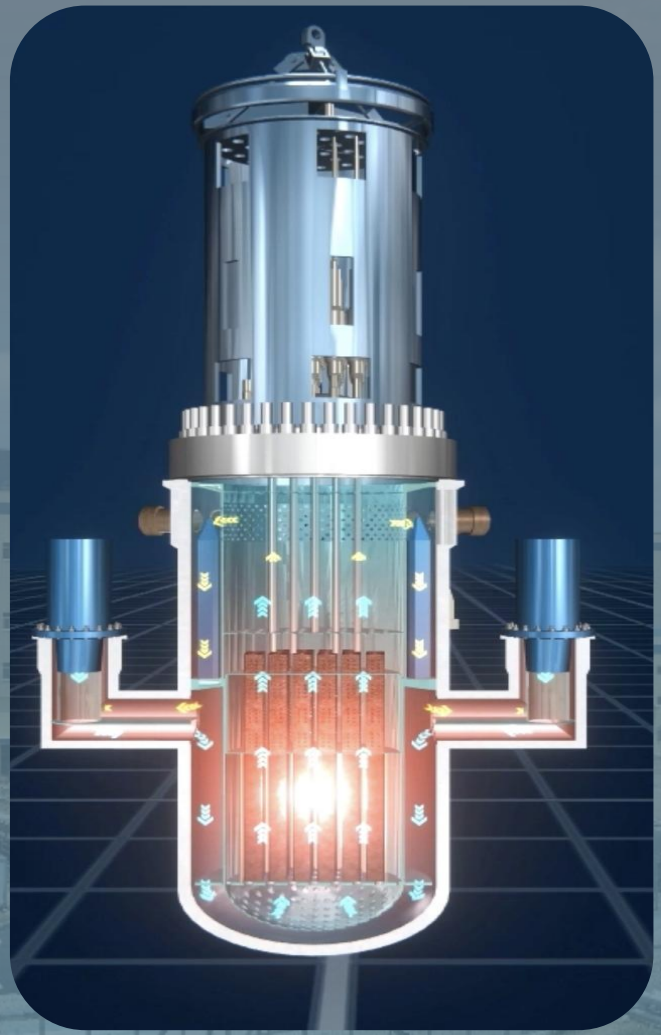
Traditional loop-type reactor

Compact layout improved reactor

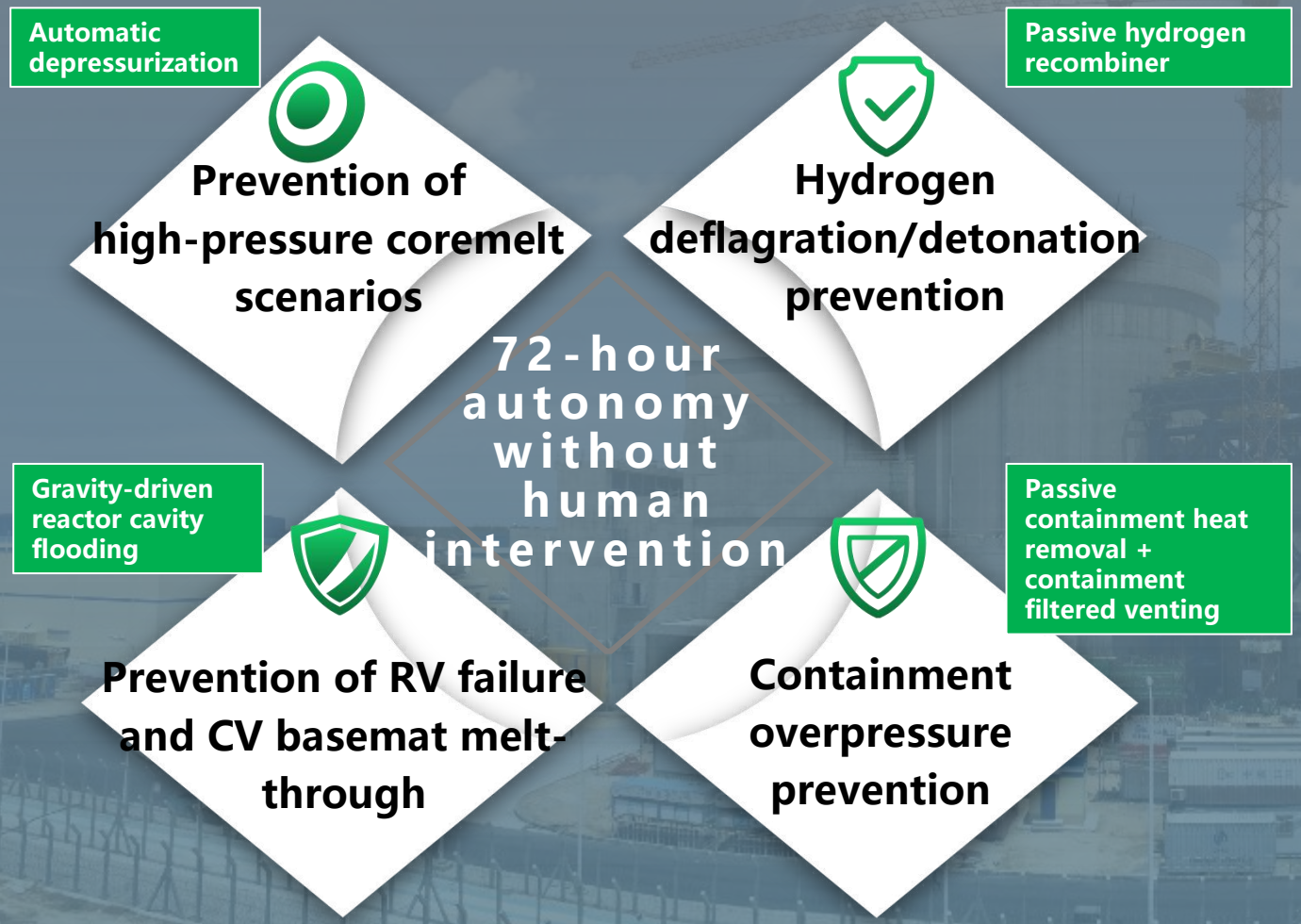
Integrated reactor module

ACP100

- Integrated Reactor Technology
- High-Efficiency Once-Through Steam Generator Technology
- Compact Shielded Main Coolant Pump Technology
- Modularization Technology
- Inherent and Passive Safety Technologies
- Semi-Underground NSSS Layout



ACP100



Outstanding safety performance

	ACP100
CDF	$1*10^{-7}$
LRF	$1*10^{-8}$

IAEA Assessment

The ACP100 design represents an innovative small PWR that incorporates passive safety features, demonstrating the capability to address extreme environmental conditions and multiple failure scenarios, thereby achieving the practical elimination of early or large radioactive releases.

ACP100

Scope Definitions	ACP100	Conventional Reactor Designs
EAB (Exclusion Area Boundary): Radius of the non-residential zone	100m	500m
LPZ (Low Population Zone): Radius of the planning restriction zone	800m	5Km
EPZ (Emergency Planning Zone): Evacuation area for emergency response	500m	5Km

ACP100 small modular reactor can be flexibly deployed near urban areas or industrial parks, offering solutions to energy supply challenges in industrial zones or remote inland regions.

ACP100

Industrial Steam Supply

Providing industrial steam for sectors such as chemical processing.

Power Supply for Offshore Platforms

Delivering clean, stable energy to clusters of offshore platforms to support marine resource development

Heavy Oil Thermal Recovery

Using steam injection to heat heavy oil reservoirs, reducing crude oil viscosity and improving extraction efficiency

Off-Grid Applications in Remote Areas

Serving as the primary power source for regions beyond main grid coverage, with robust off-grid operation capabilities

ACP100

Seawater Desalination

Using steam as an indirect heat source to produce freshwater via Low-Temperature Multi-Effect Distillation

Residential Heating

Supplying heat to end-users through heat exchange stations

Floating Nuclear Power Plants

Providing propulsion energy for floating reactors, icebreakers, and other marine vessels

Island Power Supply

A nuclear-powered cogeneration system delivering electricity and heat to islands

Replacement of Small Thermal Plants

Deploying nuclear reactors on decommissioned small thermal power plant sites

ACP100

	Project Startup	Project Approved	Construction Permit Issued	FCD	Bottom PV Head Ready	Conventional Island FCD	Internals Reach up to 0 m	Internals Finished	PV Arrival	Conventional Island Installation	Polar Crane Ready	Top PV Head Ready	DCS Arrival	Turbine Installation
plan:	2017-05-25	2021-05-31	2021-07-01	2021-07-13	2021-11-30	2021-12-13	2022-11-30	2023-04-13	2023-08-13	2023-09-13	2024-04-30	2023-12-13	2024-04-13	2024-04-13
actual:	2017-05-25	2021-05-31	2021-07-01	2021-07-13	2021-10-24	2021-11-28	2022-09-20	2023-03-08	2023-07-27	2023-08-13	2023-09-21	2023-11-03	2024-02-28	2024-03-12

	Provisional Acceptance	Connection to the grid	First Criticality	First Core Load	Operation Permit Issued	Fuel Arrival	Hot Function Test	Turbine Turning Gear Ready	Cold Function Test	Main Power Reverse Transmission	Water intake on pump station	Main coolant pumps delivered	Demineralized Water Available	Backup Power Reverse Transmission
plan:	2026-05-13	2026-04-13	2026-03-13	2026-1-13	2025-12-30	2025-11-30	2025-09-25	2025-06-30	2025-05-25	2025-03-13	2024-08-13	2024-06-13	2024-06-13	2024-06-13
actual:										2024-12-26	2024-07-23	2025/3/28	2024-03-15	2024-03-31

Global SMR Development Gains Momentum

海南核电有限公司
Hainan Nuclear Power Co., Ltd.

■ In September 2023, the "Cross-Regional Seminar on SMR Technology Development and Applications" was held in Sanya, bringing together 142 international delegates from over 50 countries and regions to discuss strategies for advancing global SMR development.


01


02


03


04


05


10


09


08


07


06


11


12


13


14


15


20


19

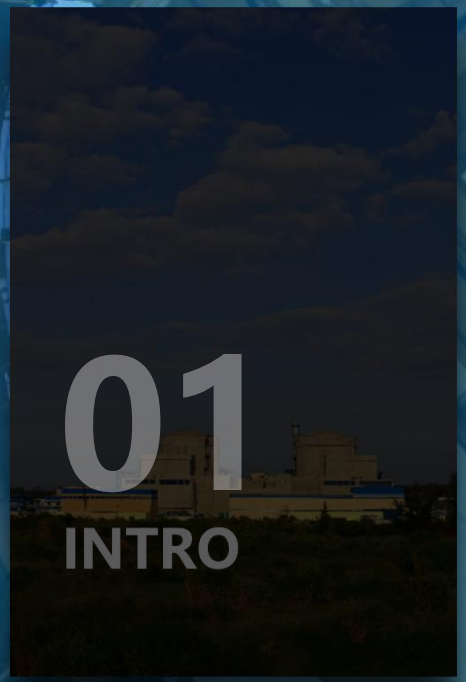

18

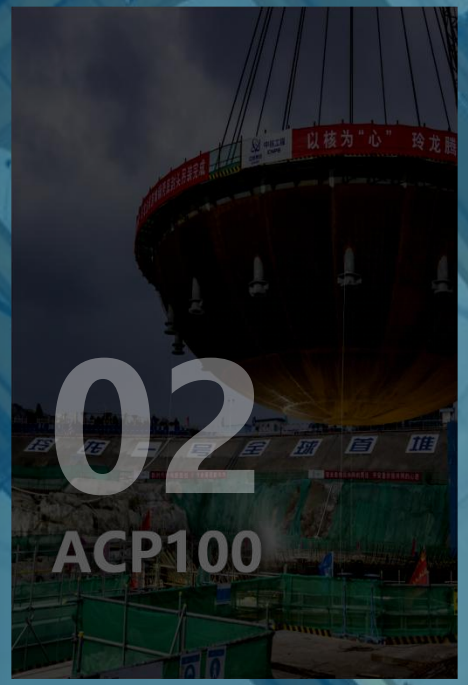

17


16

海南核电有限公司
Hainan Nuclear Power Co., LTD.
中核集团 CNNC

CONTENT





Early Owner Involvement

Plant owners' early involvement enables lifecycle optimization, precise requirement alignment, and proactive risk management, achieving strategic alignment, maintenance-oriented design, streamlined procurement collaboration, and seamless engineering interfaces, thereby enhancing plant safety and cost-effectiveness.

Through-Type Project Management

Definition

Through-Type Project Management is a management model that achieves multi-level, multi-domain collaboration through vertical penetration and horizontal integration.

Its core lies in breaking traditional hierarchical barriers, deeply integrating resources, processes, and responsibilities across stakeholders (e.g., owners, EPC contractors, subcontractors), ensuring management directives reach the execution layer directly, thereby enhancing overall efficiency.

Applicable Scenarios

Particularly suited for first-of-a-kind (FOAK) projects, complex programs, or high-difficulty construction tasks requiring multi-party collaboration (e.g., the global FOAK "Linglong One" reactor).

Early Owner Involvement

Core Features

Vertical Penetration

Penetrates the three-tier hierarchy (owner, EPC contractor, subcontractors) to enable vertical coordination across planning, design, equipment, and construction.

Example: The "6631" four-stage relay mechanism
6-month lead control for design/procurement,
3-month control for scheduling,
1-month control for construction.

Horizontal Integration

Integrates cross-project resources (e.g., Phase I operations, Phase II construction, SMR projects) to clarify responsibilities and share resources.

Example: The "1+5+N" organizational model
1 commissioning department + 5 engineering discipline departments + N shared support departments.

Agility and Proactivity

Utilizes joint control teams (design, equipment, planning, etc.) for early risk identification and dynamic process optimization.

Example: Real-time alignment of equipment delivery timelines with construction milestones to prevent delays.

Outcomes and Value

Efficiency Gains

Integrated resource sharing reduces interface conflicts and lowers costs.

Quality Assurance

Proactive controls (e.g., 6-month design planning) minimize recurrent issues.

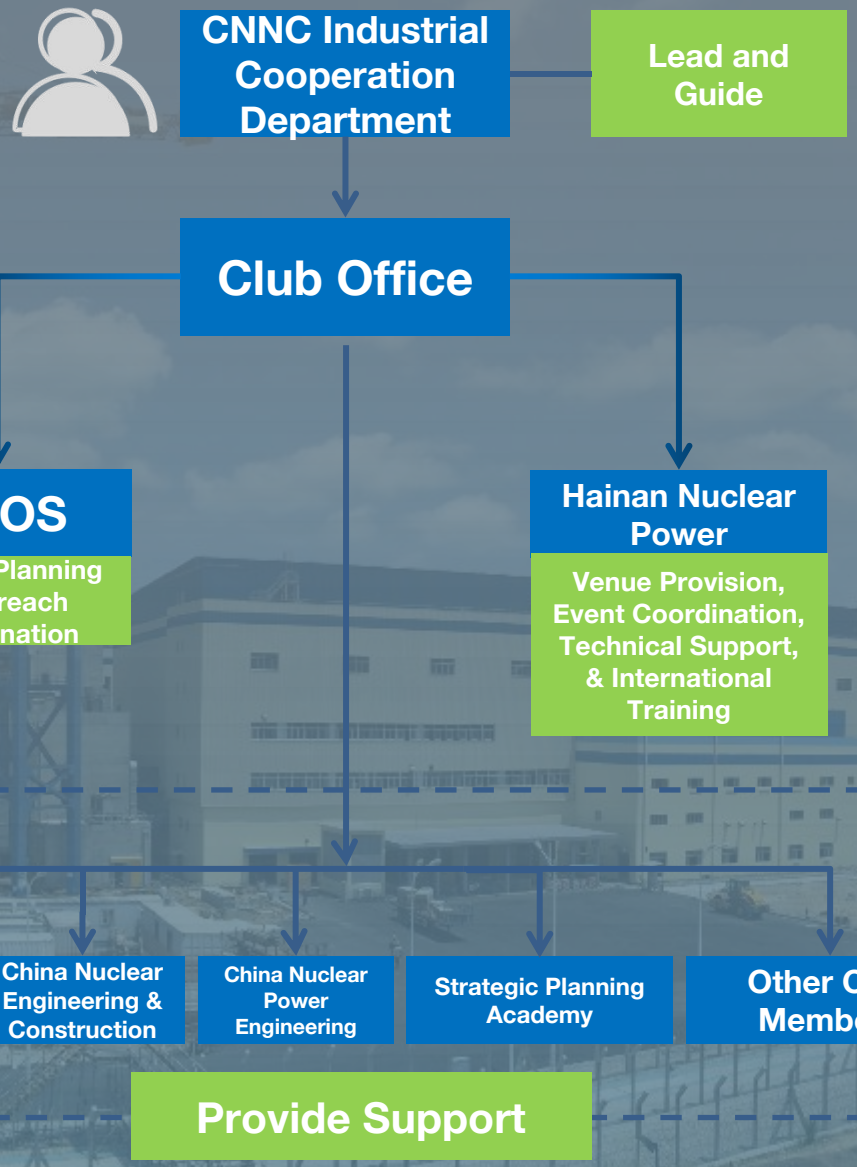
Industry Benchmark

Establish the "Exemplary FOAK Project" brand, offering a management paradigm for similar programs.

SUPER Club

SMR Users and Partners for Energy Revolution Club （SUPER Club）

- The Club is positioned as a non-legal entity with a loose organizational structure, initiated by the China National Nuclear Corporation (CNNC).
- Government agencies, private enterprises, and civil organizations interested in collaborating with CNNC may join Club activities and become members.



SUPER Club

Club activities are categorized into regular activities and thematic activities, as outlined below

Regular Activities	Conducted periodically	Annual Club Conference, Collect client needs and feedback, Promote SMR technology
Thematic Activities	Thematic Forums	Organize flexible, content-rich forums tailored to client demands for knowledge sharing, Host or co-host international organization forums to expand influence
	Thematic Training	Deliver IAEA-certified international training programs,Provide customized training (e.g., SMR feasibility studies, regulatory compliance)

Other SMR Global Promotion Initiatives

- International expos (e.g., showcase ACP100 at COP28).
- Site visits and business negotiations (e.g., tours of the Hainan SMR demo project).
- Facilitate targeted collaboration by connecting Club members with core member organizations (primarily CNNC subsidiaries) for technical exchanges and partnership discussions

International Training Services

Strong Training Capabilities

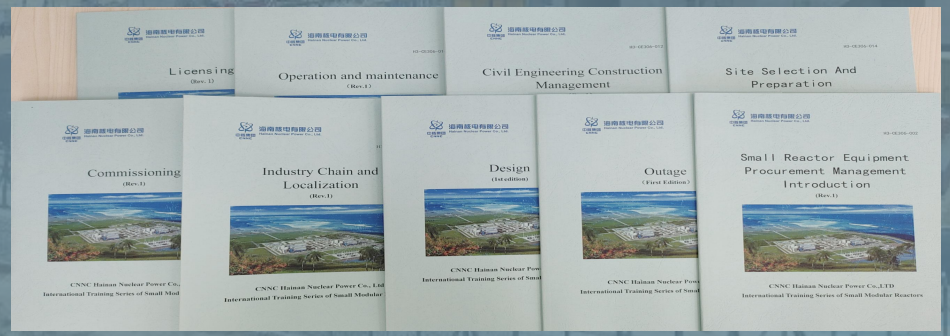
Comprehensive SMR Training Programs

Offers “100+ courses” across 7 categories:

- Industry overview
- Pre-project development
- Engineering & construction
- Commissioning
- Operations & maintenance
- Fundamental theories
- Management competency enhancement

On-Site Shadow Training

Provides hands-on learning at SMR project sites



Advanced Training Facilities

Existing Facilities

- Training building: 4,400 m²
- Dedicated SMR simulator training area: 600 m²

New Facilities (2025)

- Skill Development Center: 4,130 m², equipped with: 17 specialized SMR equipment training labs, 15 training classrooms
- 2 full-scope SMR simulators

SMR-Specific Resources

Dedicated classrooms and teaching aids tailored for SMR technology

International Training Services

Extensive International Collaboration Experience

1. Since 2024,Hosted ” 20+ international delegations” from 50+ countries
2. Delivered SMR site tours, simulator demonstrations, and training briefings to 600+ participants
3. Organized 4 major international conferences (e.g., IAEA events, China-Arab Forum)
4. Conducted 3 specialized SMR training sessions for:
   - IAEA international trainees
   - Tsinghua University nuclear energy international students
   - Nuclear energy senior management programs.

Strategic Agreements & Platforms

IAEA-Hainan Nuclear Power Agreement (October 2024): Small Modular Reactor Capacity Building Implementing Agreement.

Hainan Nuclear Power will carry out IAEA-coordinated SMR education, training, and human resource development.

Jointly implement technical assistance projects and cross-regional workshops to accelerate global SMR deployment.


THANK YOU