

# Main data on TNPP and on corrective actions taken after «Fukushima NPP» accident

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# 1 Information on TNPP site



Tianwan NPP is situated in the East part of the China Republic, near Lianyungan town. There are 600 km in the direct line from Shanghai

## 2 Генеральный план ТАЭС

### General layout



8 Units are planned to construct on the TNPP site

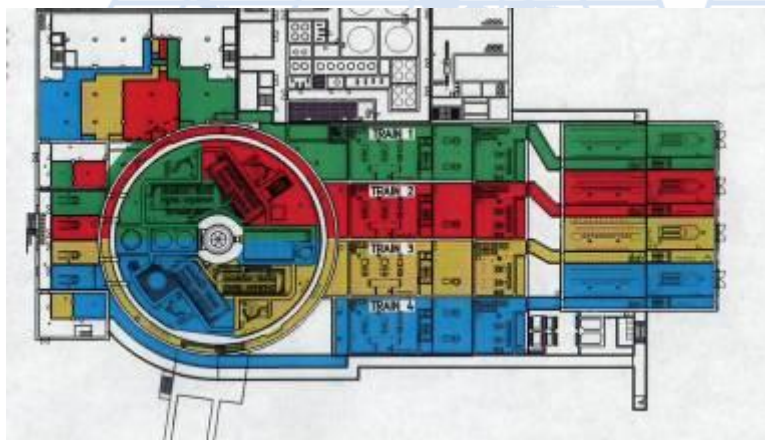
### Units 1-4



- **Units № 1 and 2 with VVER-1000/428 reactors having electrical capacity of 1060MW were put into commercial operation in 17.05.2007 and 16.08.2007, respectively.**
- **Units № 3 and 4 of TNPP will be constructed in the same way as two previous ones with some additional design modifications and improvements. The official date of construction is planned by the end of 2012.**

# 3 Technical specifics

The design of first two units provides a series of up-to-date concepts: four trains of safety system, melt catcher of the core, digital stress monitoring system, double containment etc.

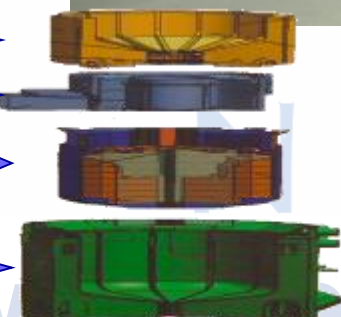


下部板

通风收集器

牺牲材料篮

换热组片



## 4 Information on operation

From the TNPP first stage Units №1 and №2 demonstrate a good performance

Mln.kWh

— Generation  
— To grid





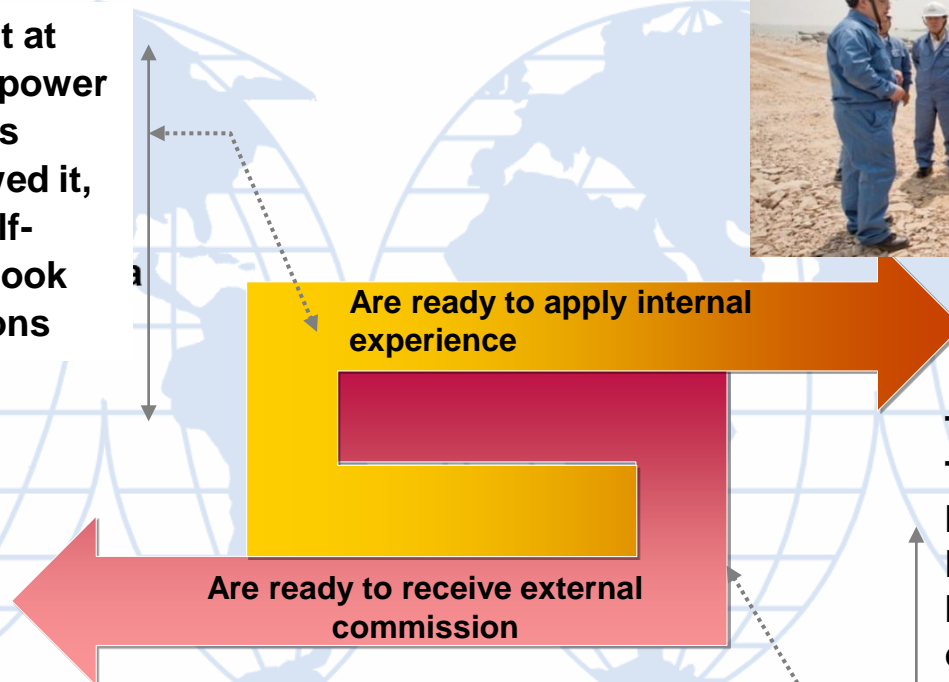
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**State integrated inspection of nuclear safety  
after «Fukushima NPP» accident**

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# 1 State integrated inspection of nuclear safety after Fukushima NPP accident

After the accident at Fukushima nuclear power plant, TNPP has immediately reviewed it, carried out a self-assessment and took appropriate actions



The 4th~6th May of 2011 TNPP has hosted a State Integrated Inspection of Nuclear Safety, a Nuclear Integrated Inspection Team of Safety for civil facilities comprising experts from NNSA, State Energy Directorate and State Seismology Office.





## 2 State Integrated Commission defined 11 areas subjected to the checking

▶ Good choice of initial events for the selection of site.

▶ Evaluation of emergency planning and ability to protect nuclear installation against flooding.

▶ Evaluation of emergency planning in case of earthquake and evaluation of nuclear installation seismic resistance.

▶ Efficiency of quality assurance system for nuclear installation.

▶ Checking of the nuclear installation fire extinguishing system.

▶ Actions to prevent an accident impaired by the natural extreme events and to mitigate consequences of the accident.

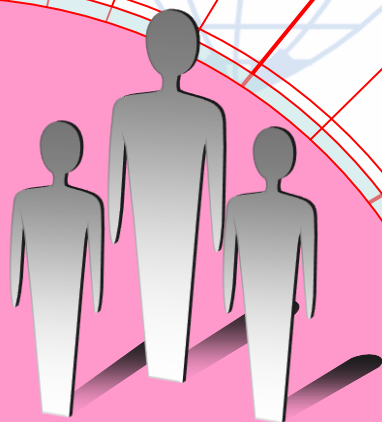
▶ Review and evaluation of the plant total blackout, applicability of an additional power supply after the loss of emergency power supply, as well as provisional versions in such case.

▶ Actions to prevent severe accidents and to mitigate their consequences, evaluation of their reliability.

▶ Response to emergency event and interface with Media.

▶ Efficiency of radiation situation monitoring and of emergency response system.

Other potential vulnerable areas:  
▶ Actions to maintain safety of the spent fuel pool, preliminary works and radiation protection of the recovery personnel, post-accident sampling of liquid and gaseous fluids, radiation protection of the sampling personnel etc.



# 3 Findings of the commission

## A Findings of the Inspection

TNPP project, in accordance with the State Commission for Nuclear Safety Inspectorate findings, complies with current regulations and nuclear safety standards and IAEA Guidelines

Findings of the State Commission at TNPP : inherent safety, up-to-date design and operational level of TNPP Units 1,2 are the most advanced, between NPPs, in the China.

## B NNSA managerial requirements

Eventual Requirements from NNSA to TNPP were received 25.10.2011. The requirements are divided into three parts:  
General requirements (5 items).  
Scheduled corrective actions with deadlines dates up to the end of 2011 (4 items).  
Scheduled corrective actions with deadlines dates up to the end of 2013 (6 items).



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## Main corrective actions at TNPP

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# 1 Four corrective actions are implemented in 2011—**2011-1**

## NNSA Requirement 2011-1

*“To check individually the water resistance of appropriate doors, windows, ventilation ducts, cable penetrations and penetration of process pipelines” . 2011-1*

Implemented corrective actions at TNPP.

1



2



3



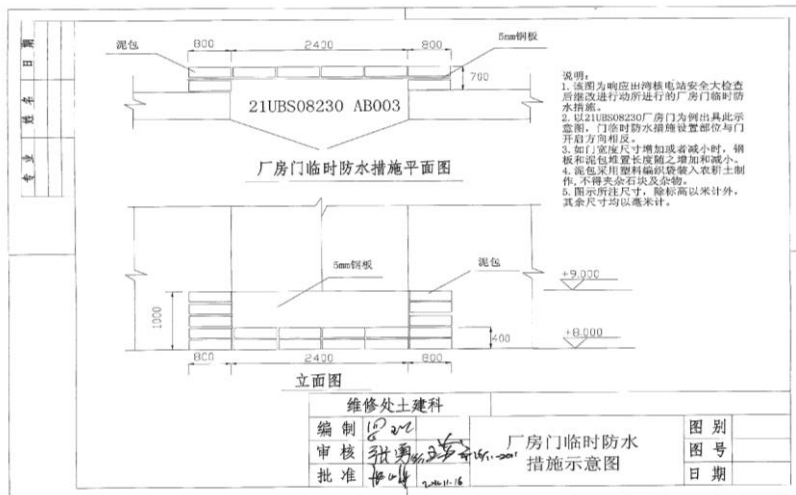
# 1 Four corrective actions are implemented in 2011—2011-2

## NNSA Requirement 2011 — 2

*Develop, prior to the completion of water protection wall on the inner side of east breakwater, and implement temporary measures to protect diesel generators, electrical building and other important construction from flooding.*

### Corrective actions at TNPP

An emergency plan is developed against high water including activities to protect important buildings against flooding. Appropriate arrangements are prepared.



# 1 Four corrective actions are implemented in 2011—2011-3

## NNSA Requirement 2011-3

*"Taking into account all-inclusive appropriate measures to ensure core and pool cooling down at total plant blackout, as well as the requirement to maintain necessary control functions after the accident, an additional set of mobile power source, portable pump and necessary means for connecting it should be provided".*

### Corrective actions at TNPP

Core cooldown at SB0

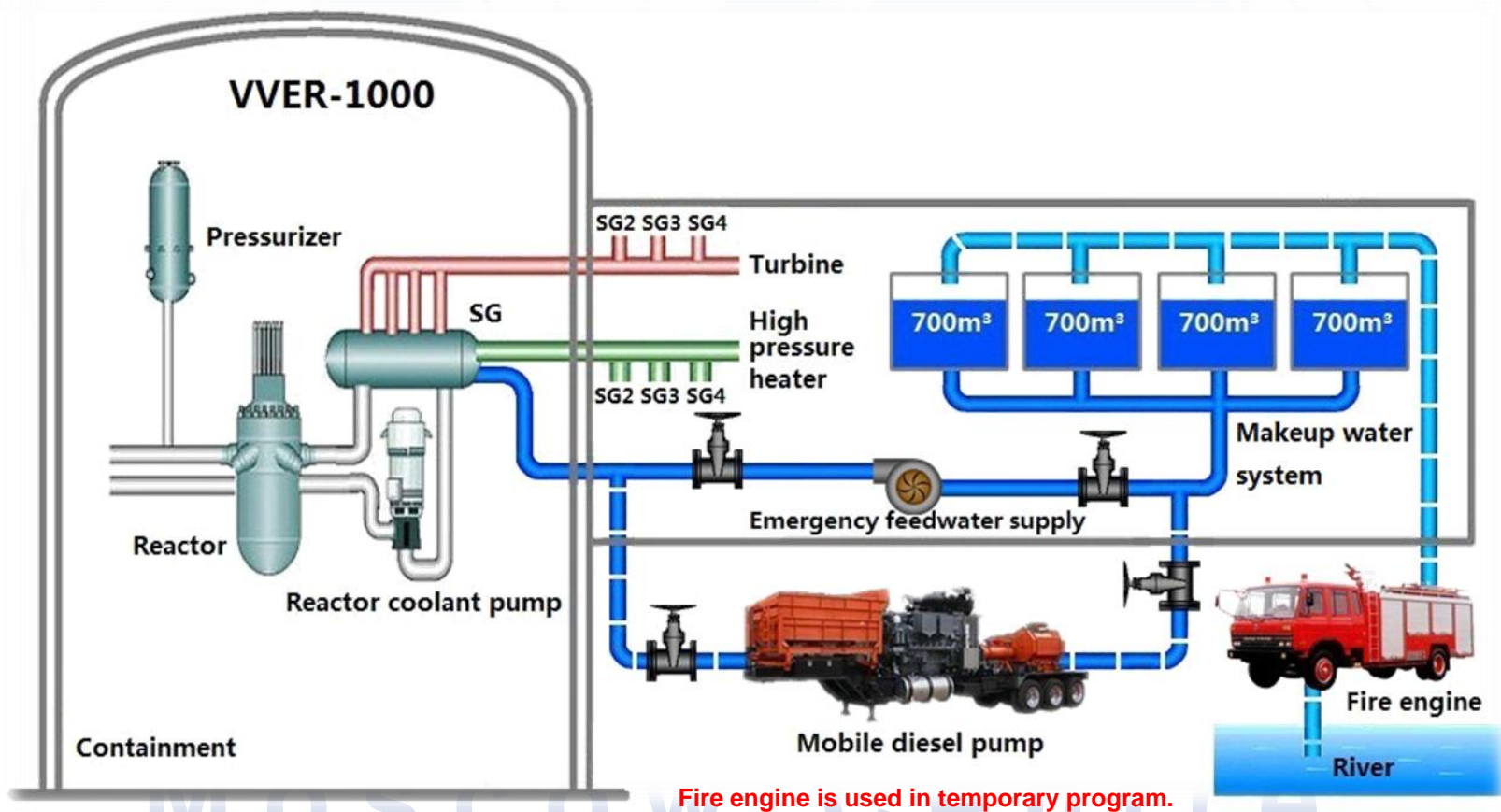
Spent fuel pool cooldown

Mobile power supply at SB0

Maintain level of water and of temperature in spent fuel pool

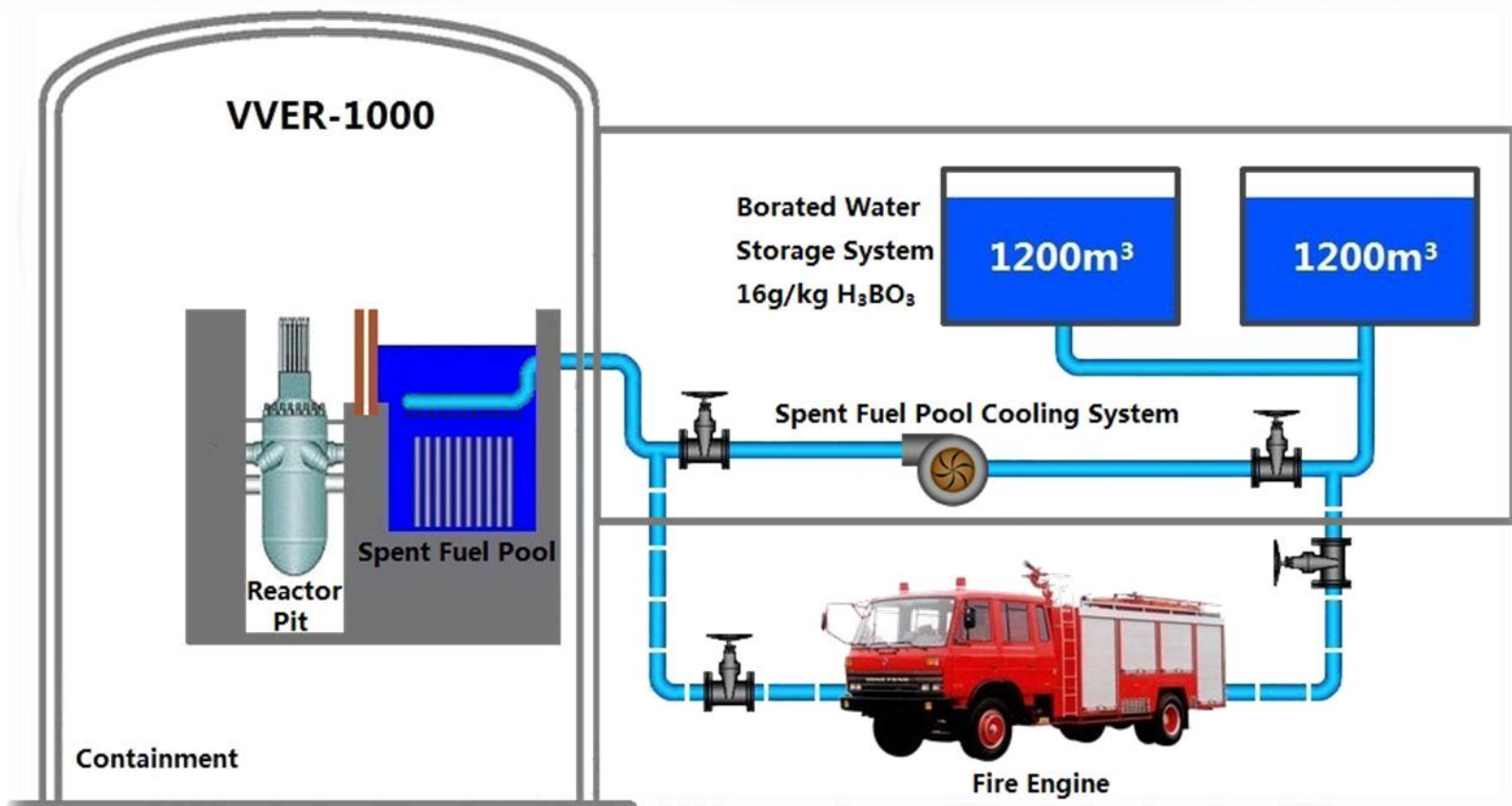
# 1 Four corrective actions are implemented in 2011—2011-3

- 1) Core cooling down at SB0 is accomplished by water pumping due to a mobile pump (or fire tank truck) from an emergency make up tank through emergency pipe in SG.



# 1 Four corrective actions are implemented in 2011—2011-3

- 2) Spent fuel pool cooling down is accomplished by a fire tank truck





# 1 Four corrective actions are implemented in 2011—2011-3

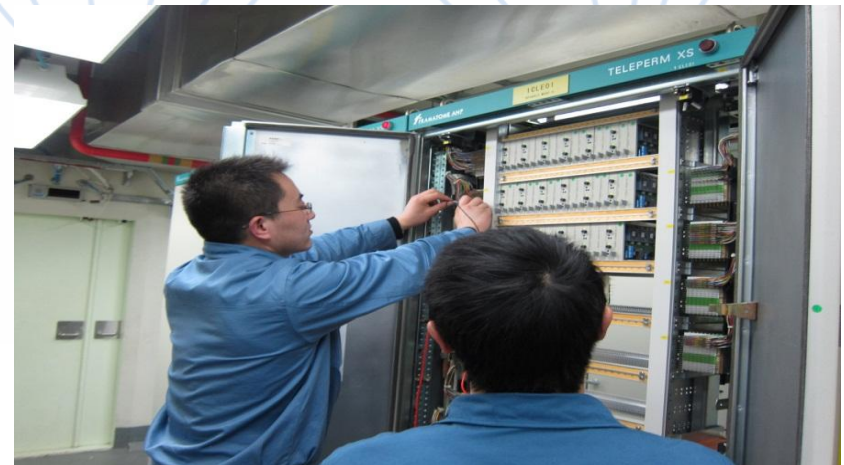
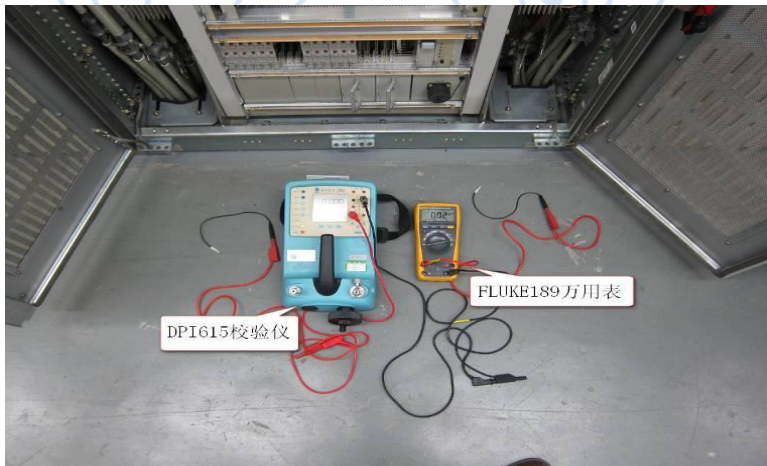
## 3) Mobile power source facility at SB0.

- Currently, the TNPP has a mobile diesel generator : output voltage - 0.4 kV, nominal capacity - 30 kW. It is designed to supply voltage to the cooling water valves of core catcher, to emergency relief valves of the primary circuit and other electrical equipment.
- The local electrical company is equipped with an emergency power supply vehicle, with a voltage of 0.4 kV and a rated power of 200 kW. In case of need, it can be sent immediately, by the authority order, to the site, where connections are already prepared.



# 1 Four corrective actions are implemented in 2011——2011-3

- 4) Maintaining ability of the spent fuel pool to control the water level and temperature.
  - In case of plant blackout, when the control over pool parameters is failed, this control will be carried out manually using hand-held devices. Converters of water level and temperature checkpoints are connected to the measuring cabinet by rigid wires. Portable devices measure current or resistance values on the appropriate terminal of measuring cabinet, and, then, these current and resistance values are converted into real values of level and temperature.



# 1 Four corrective actions are implemented in 2011—2011-4

## **NNSA Requirement 2011-4**

*To improve regulations of operator actions after an earthquake in order to increase the ability of plant response to the earthquake*

### Corrective actions at TNPP

*A regulation is developed for «Operations at reactor shutdown due to an earthquake»*

## 2 Corrective actions with dealine dates **up to the end of 2013**

No.	NNSA Requirement	Status of implementation
2013-1	«Complete the construction of flood water wall on the inner side of the east breakwater to increase ability to protect the site against flooding.».	A decision was made -find a solution by mathematical modeling. Currently, a request is drawing up.
2013-2	«Develop and implement severe accident management guideline, to train the appropriate staff».	An assignment is issued to the Chinese Design Institute for developping. Deadline – the end of 2012.
2013-3	«Conduct a probabilistic seismic safety assessment or a review of seismic resistance margin of the site».	There are talks with Institute for reviewing.

## 2 Corrective actions with deadline dates **up to the end of 2013**

No.	NNSA Requirement	Status of implementation
2013-4	«Develop options for responding to the simultaneous occurrence of an emergency situation at several TNPP Units and assess the ability of emergency headquarters, assess staffing, personnel coordination and equipment recovery options».	Lessons learned from «Fukushima NPP» accident were taken into account, corrections are introduced in the Emergency Response Plan within the site (Plan is submitted to NNSA to approval).
2013-5	«Carry out investigations to increase the operability of batteries».	A preliminary version of modernization to increase battery capacity is developed.
2013-6	«Assess the need for pressure relief in the containment during severe accidents and take necessary measures resulting from evaluation».	The need of pressure relief in the containment, in accordance with the results of "Severe Accident Management Guidelines" will be considered.



**THANK YOU FOR ATTENTION**

W A N O

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