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ITU Green standards week

Innovating today for a sustainable tomorrow_

Review of
the Developing Technologies of
Cabled Ocean Observatory in China

Prof. Canjun Yang

Zhejiang University

The State Key Lab of Fluid Power Transmission and Control

Sep. 19, 2013



CONTENT

- ◆ Lab Prototype in Zhejiang University
- ◆ Testing Prototype and Sea Trials
- ◆ The Pilot Regional System in South China Sea
- ◆ The Pilot Coastal System-Z₂ERO
- ◆ Other Projects in China

Lab Prototype in Zhejiang University



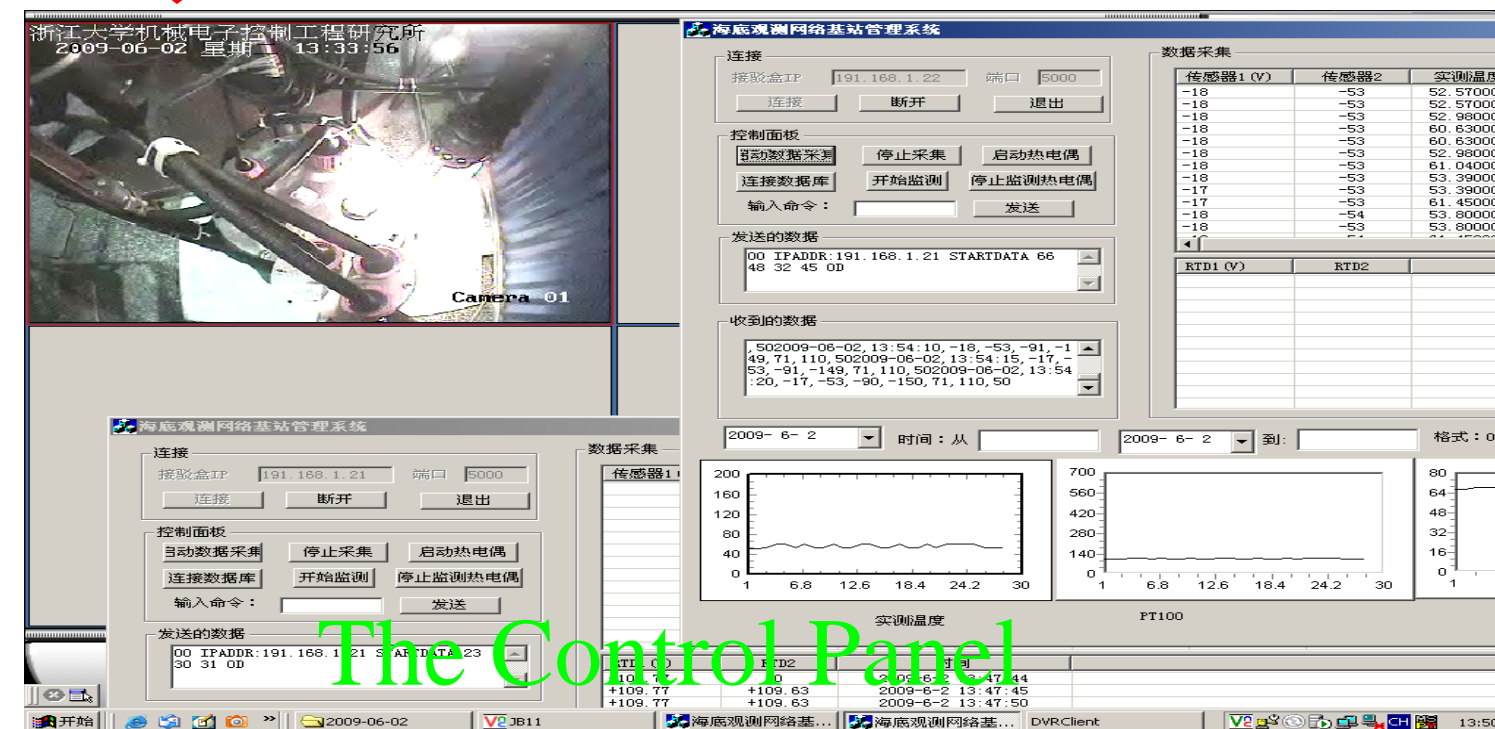
Shore Station



Shore Station Container
(2000 VDC powered)



Primary Node
in Pool

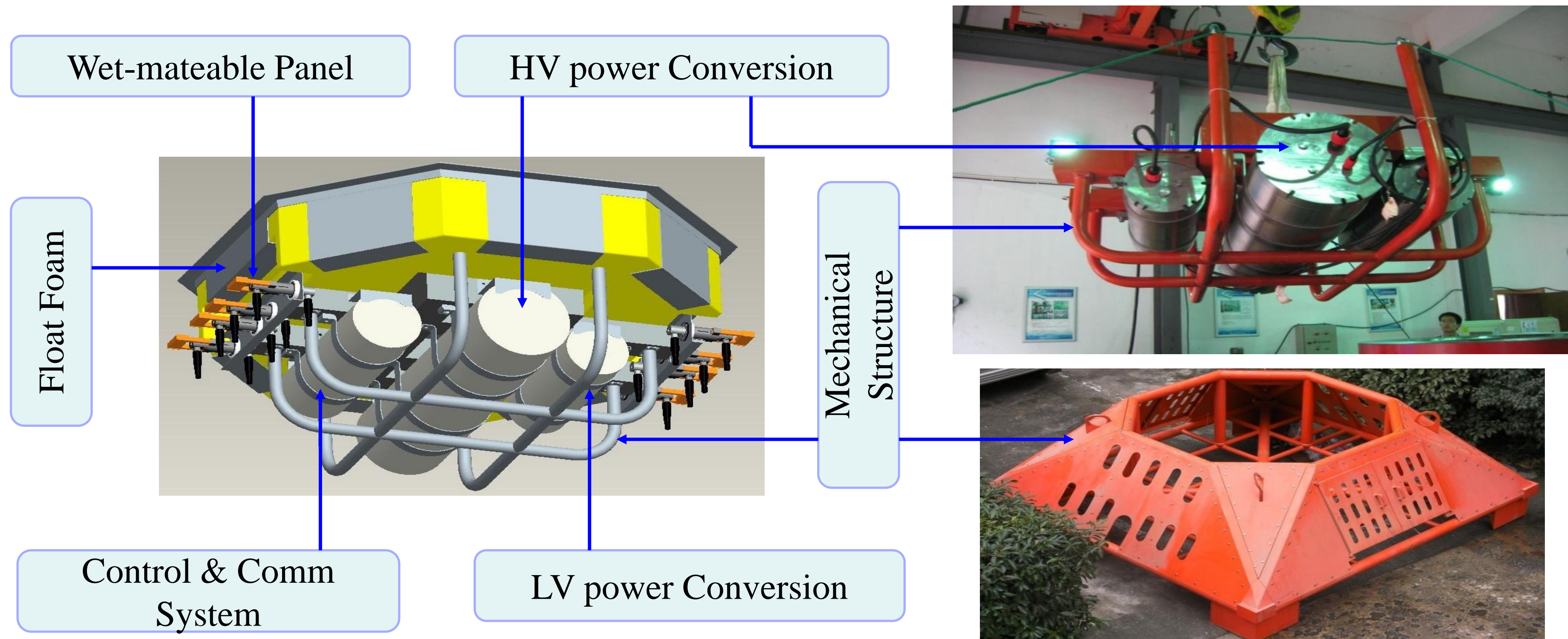


The Control Panel

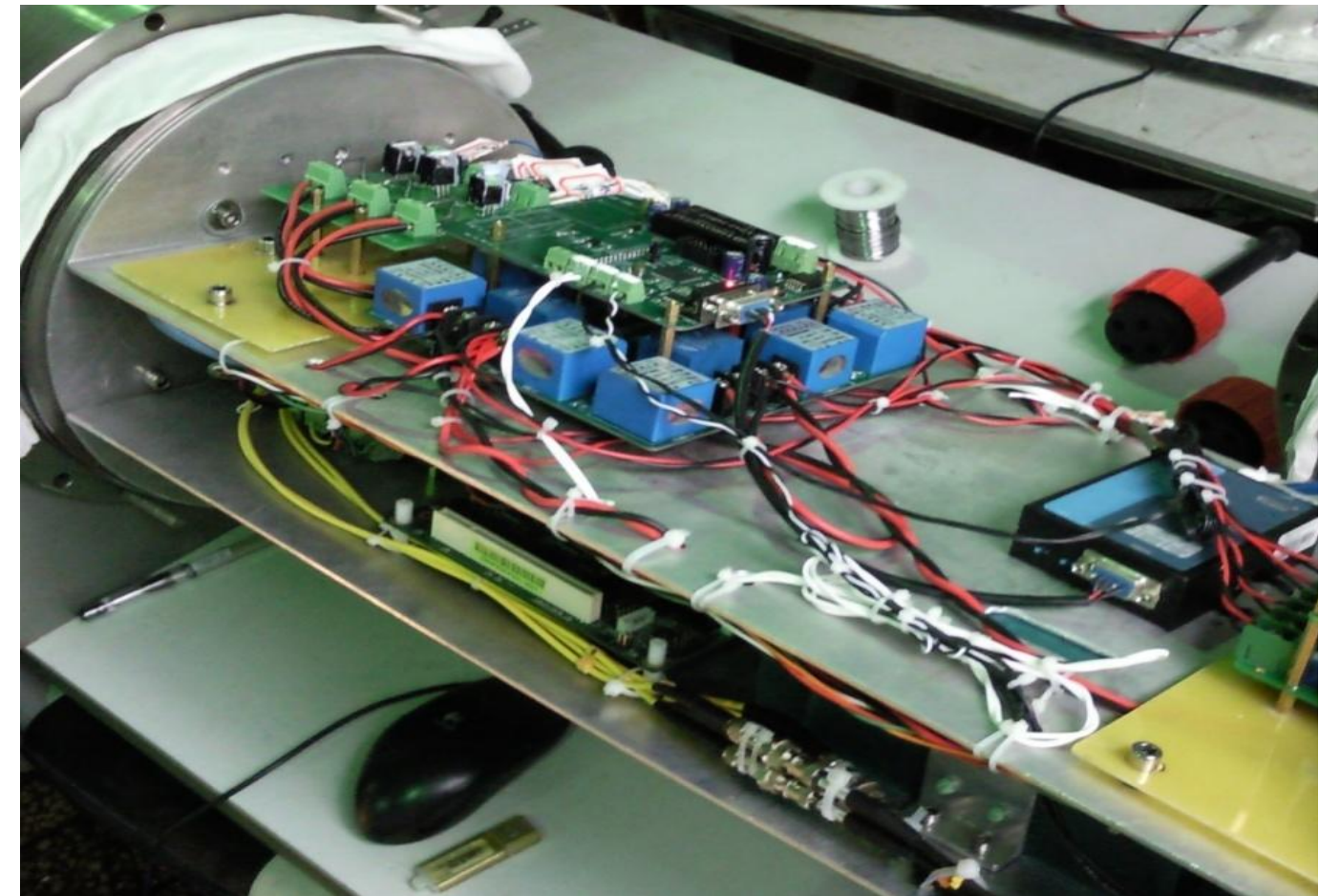
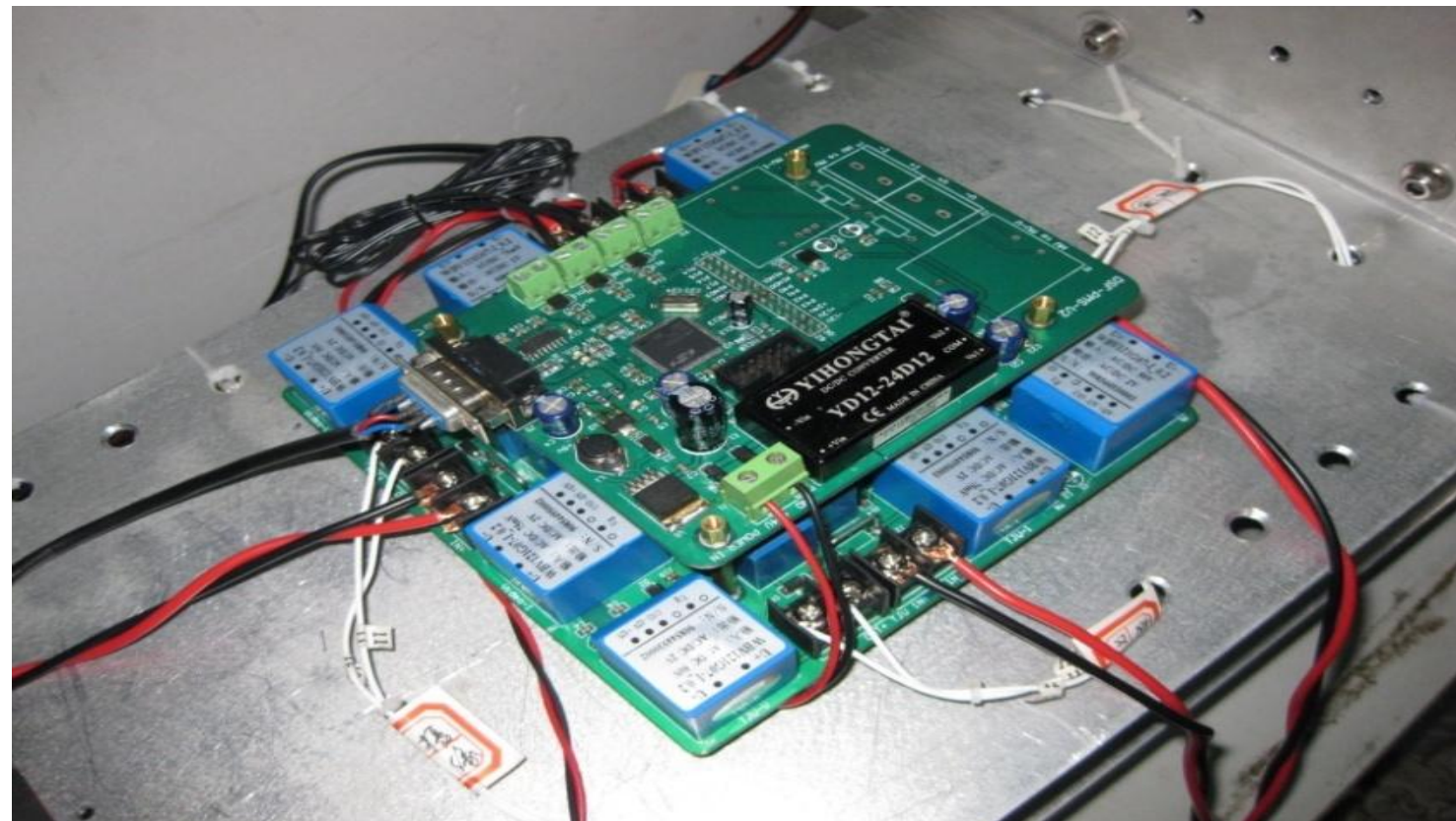


Secondary Node
in Pressure Chamber

Mechanical Design of the Junction Box



Control & Communication System



10kV Powered Observatory-Lab Test

10kVDC
Power
Supply



Control
Server



1km O/E Submarine Cable

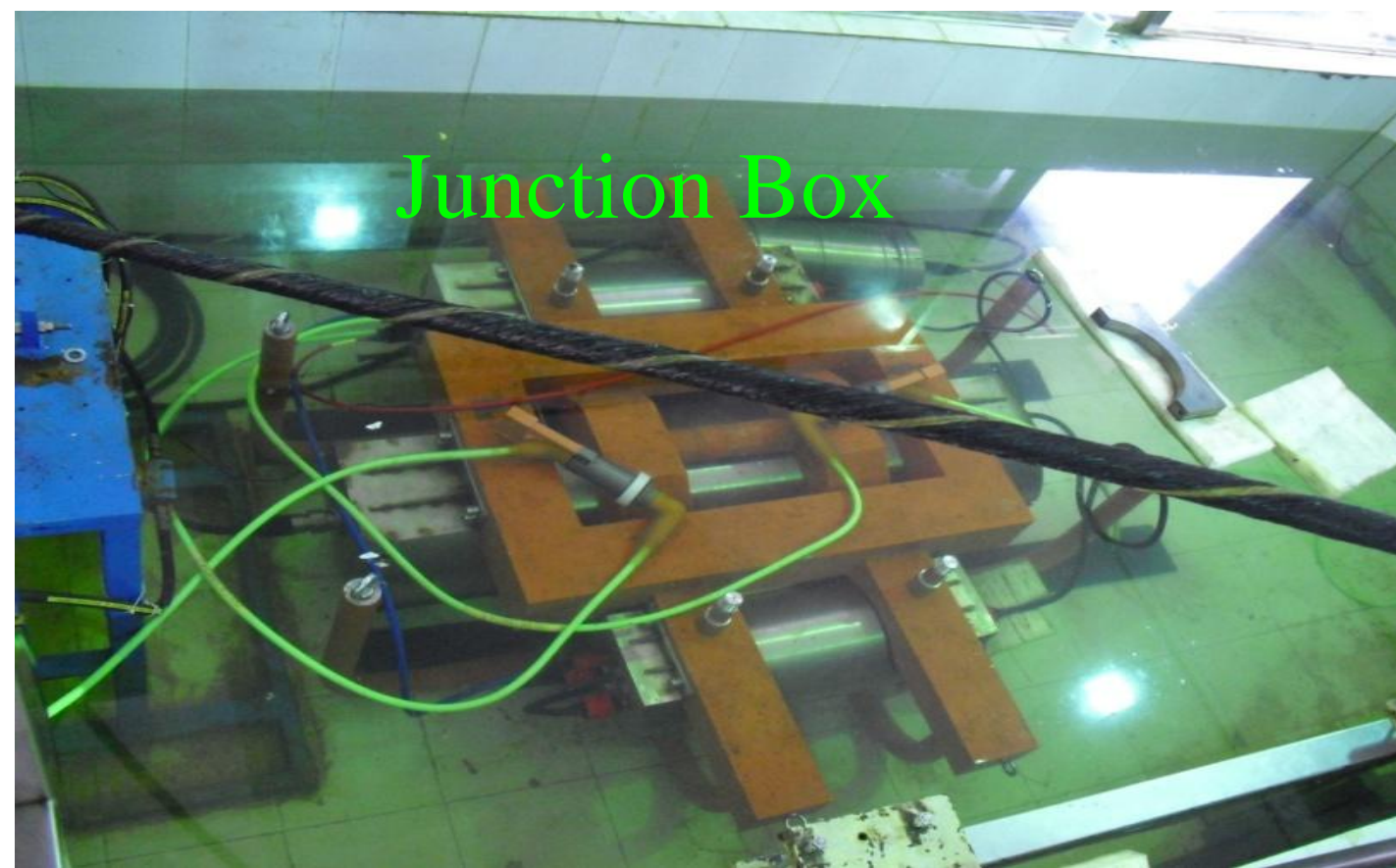


Lab Test (July 2010)
Location: Zhejiang Univ.

Camera System



Junction Box



Chemical System
Physical System



Shallow Water Sea Trial

Sep. 2010

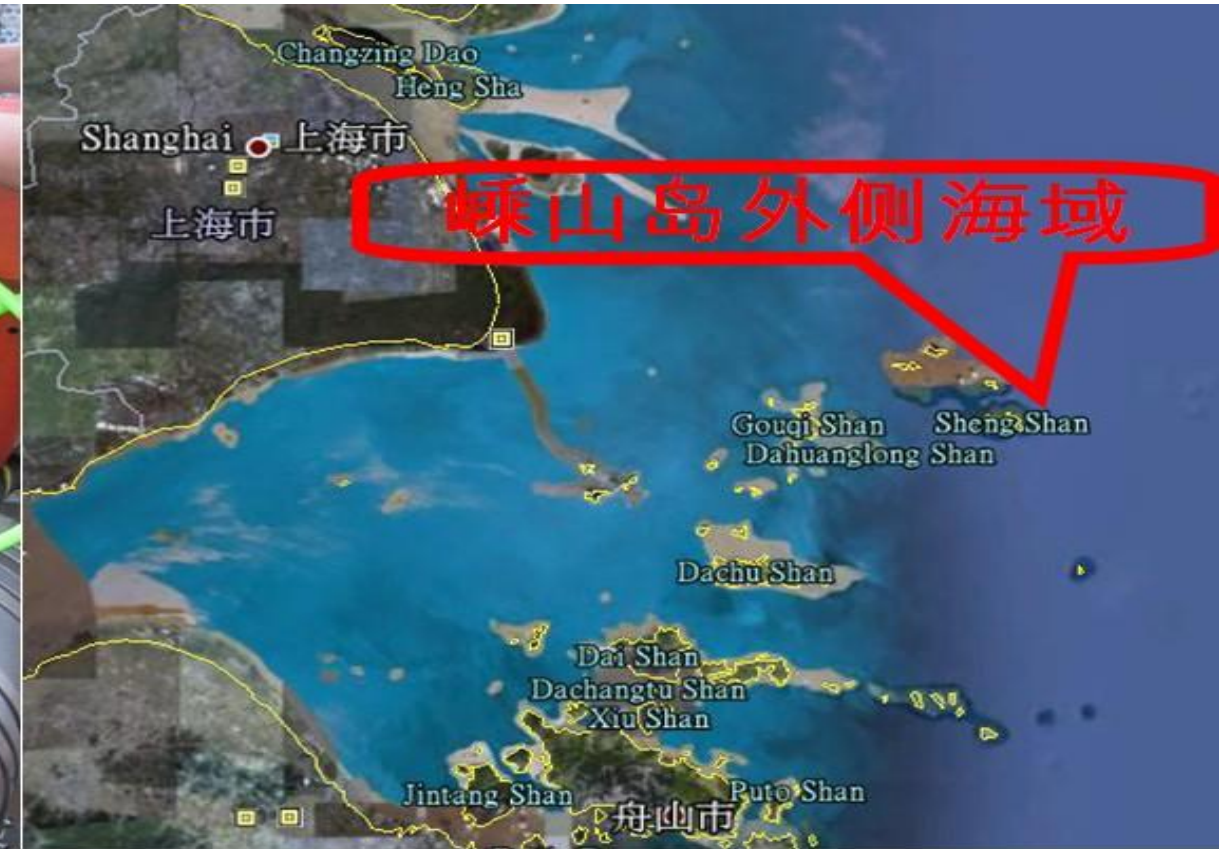
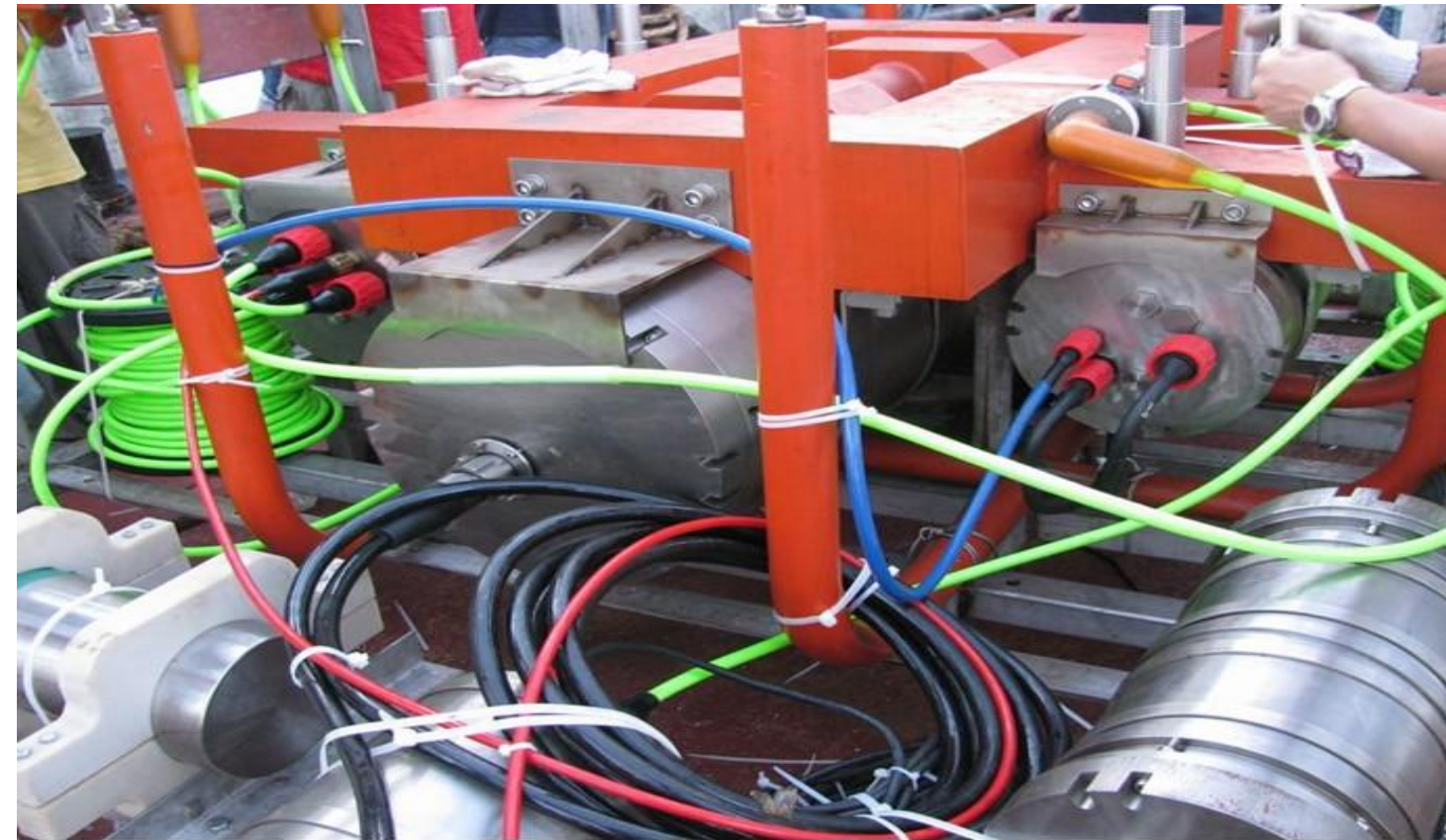
Shengshan Island

Volt: 10 kV

Depth: 31 m

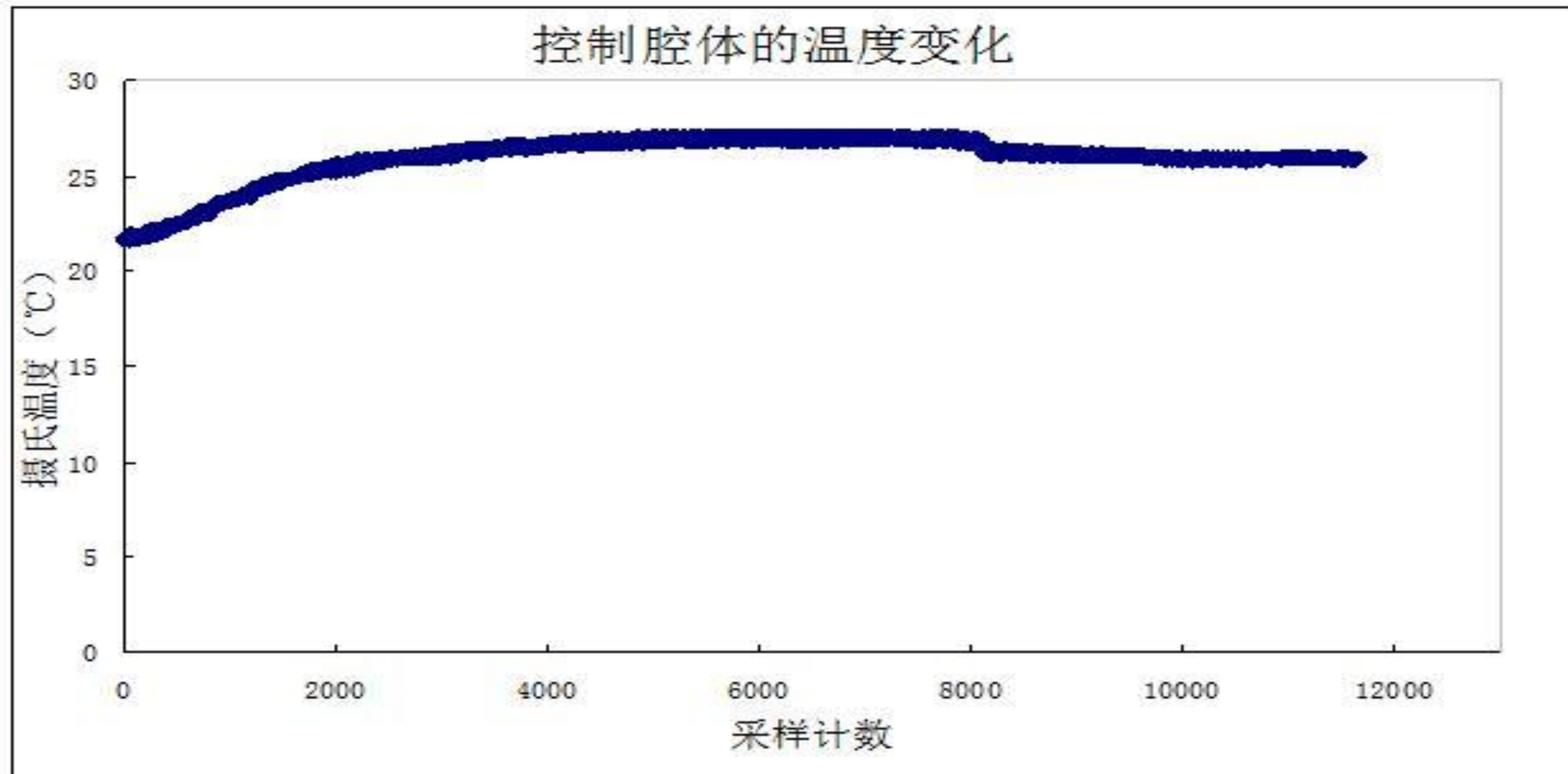
Length: 1 km

Duration: 5 d



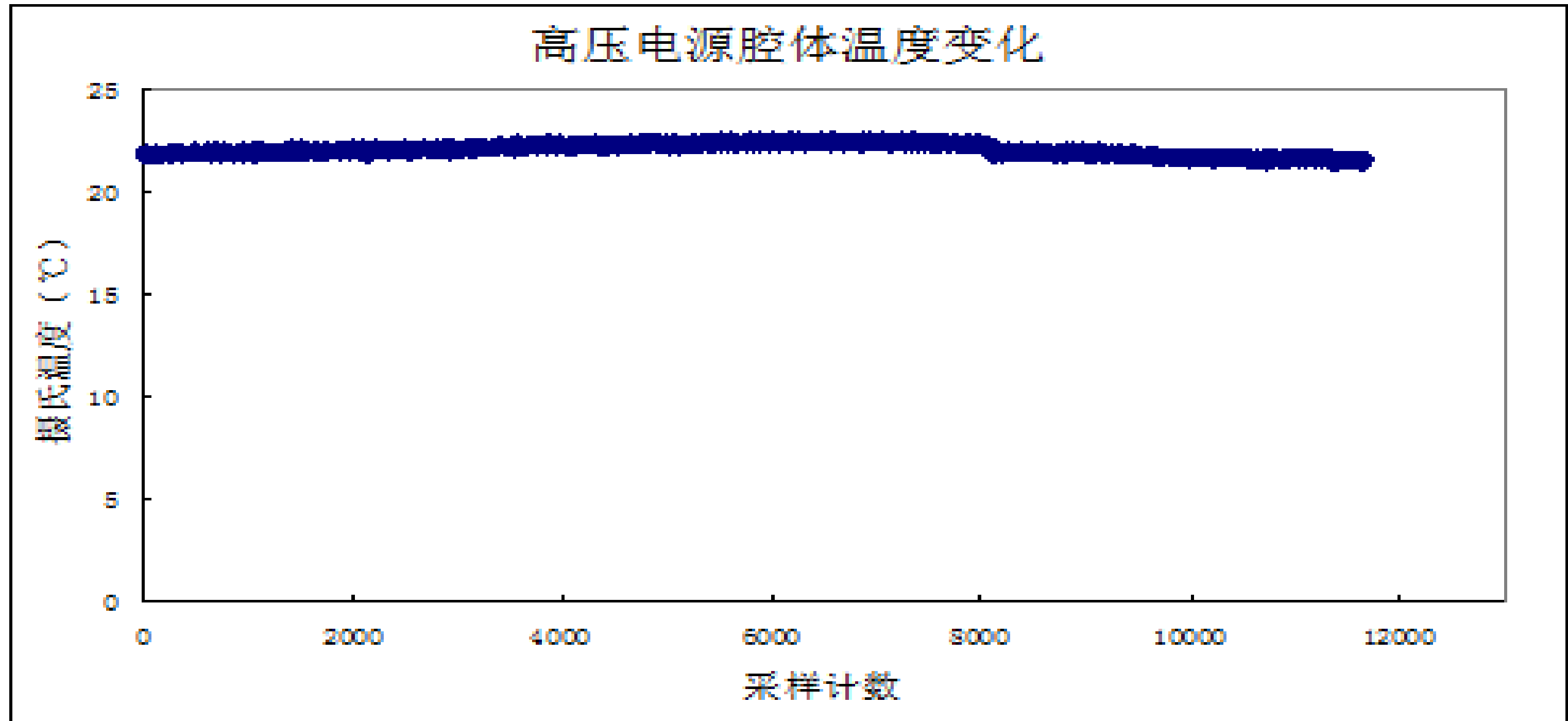
Shallow Water Sea Trial

Temp in Control Vessel (Segment)



Shallow Water Sea Trial

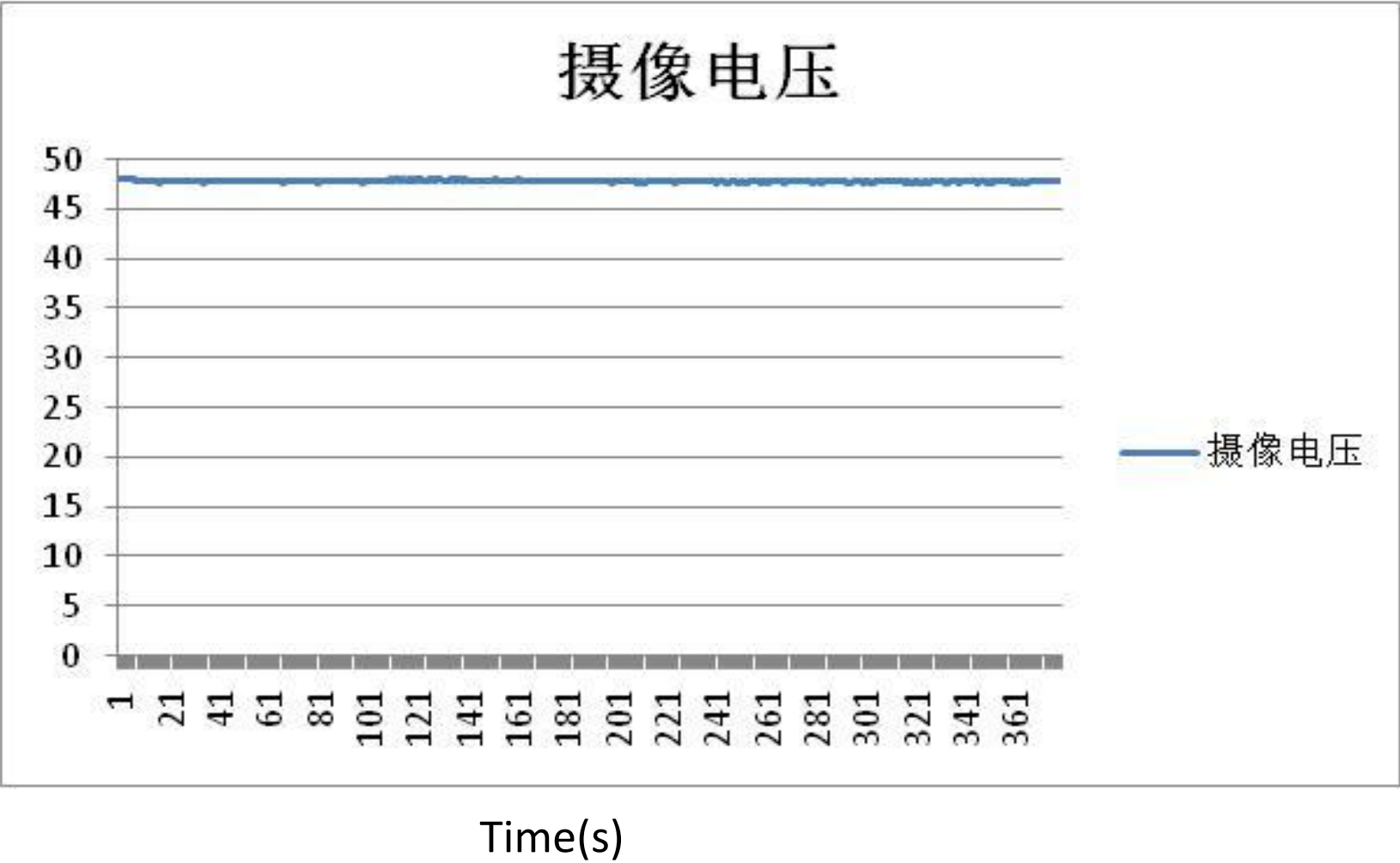
Temp in 10kV-375V Power Conversion Vessel (Segment)



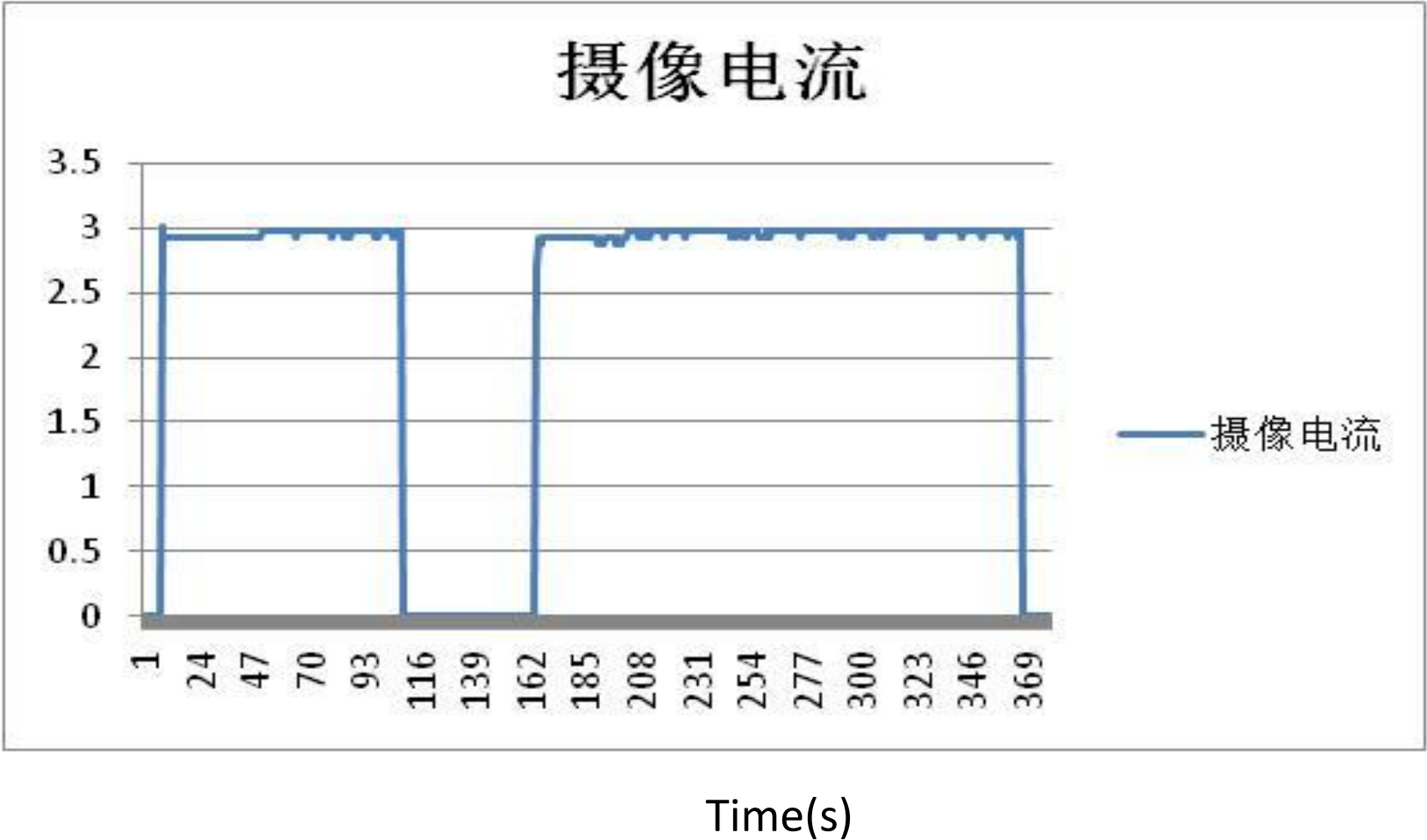
Shallow Water Sea Trial

Power Status (Segment)-Cameral System

V

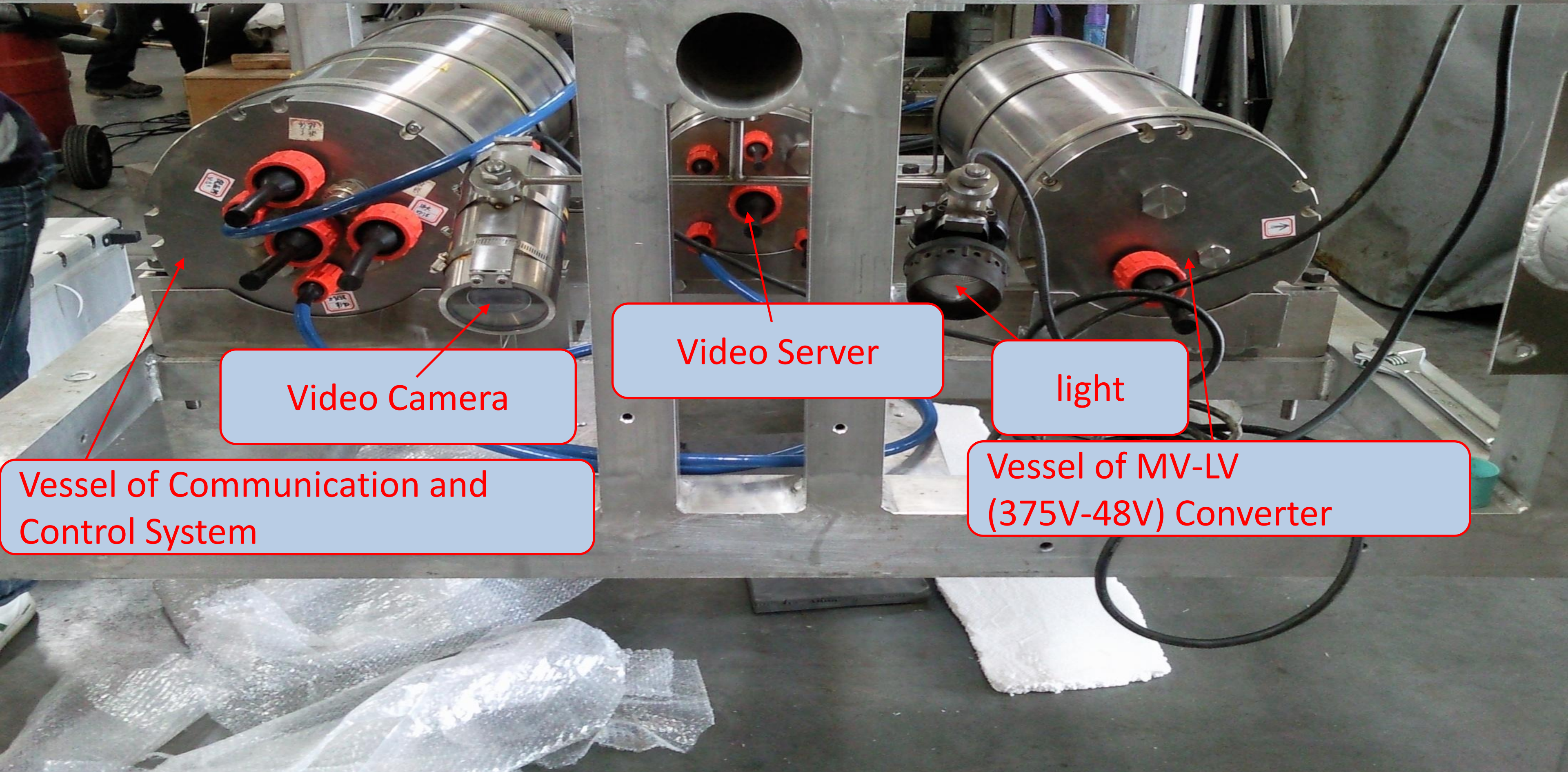


A



Time:2010-09-06-12

Secondary Junction Box Connected to MARS



Video Camera

Video Server

light

Vessel of Communication and Control System

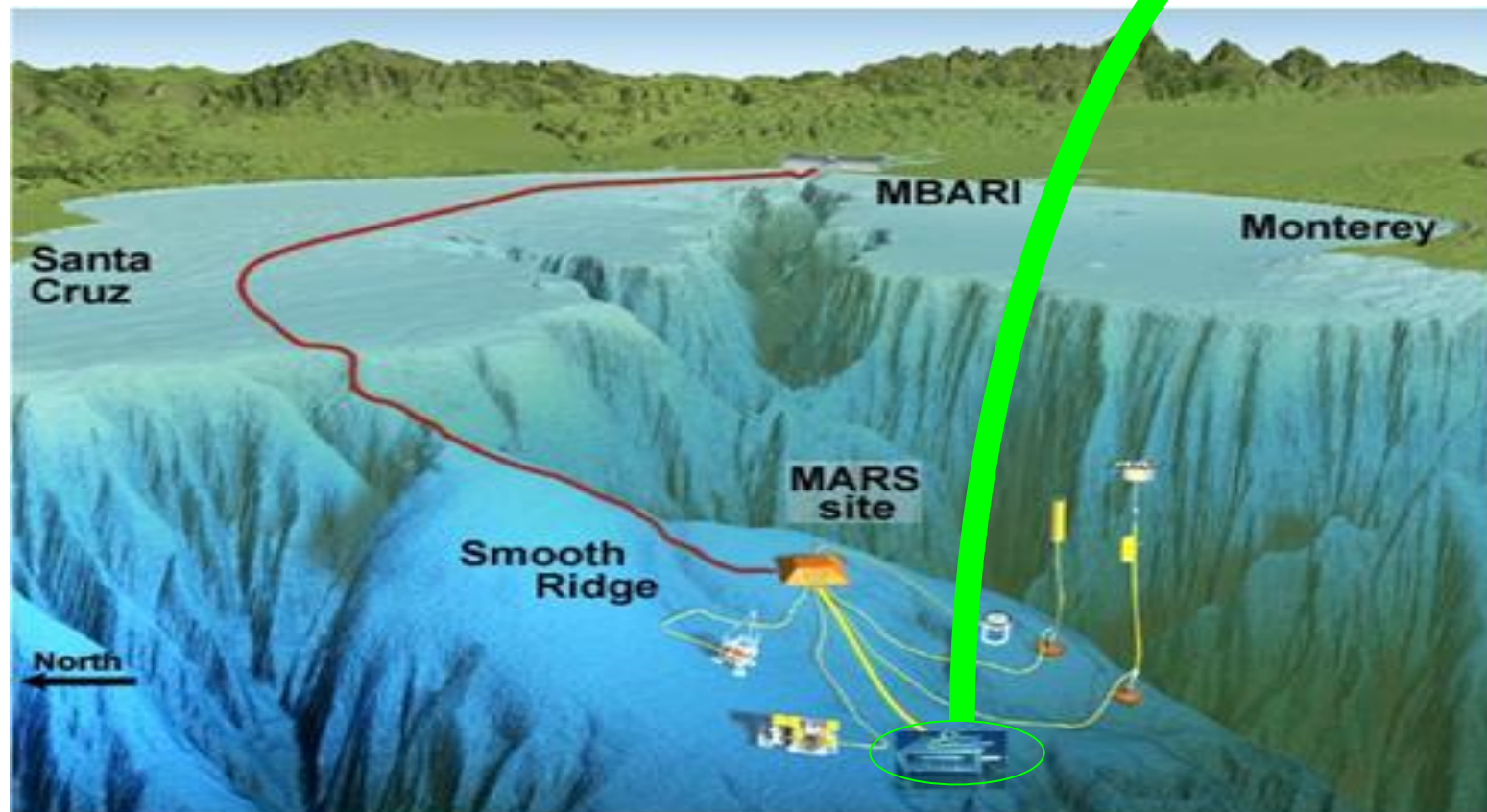
Vessel of MV-LV (375V-48V) Converter

Deep Sea Trial in Monterey

Apr. 4, 2011-Oct. 25, 2011

Monterey Bay, California

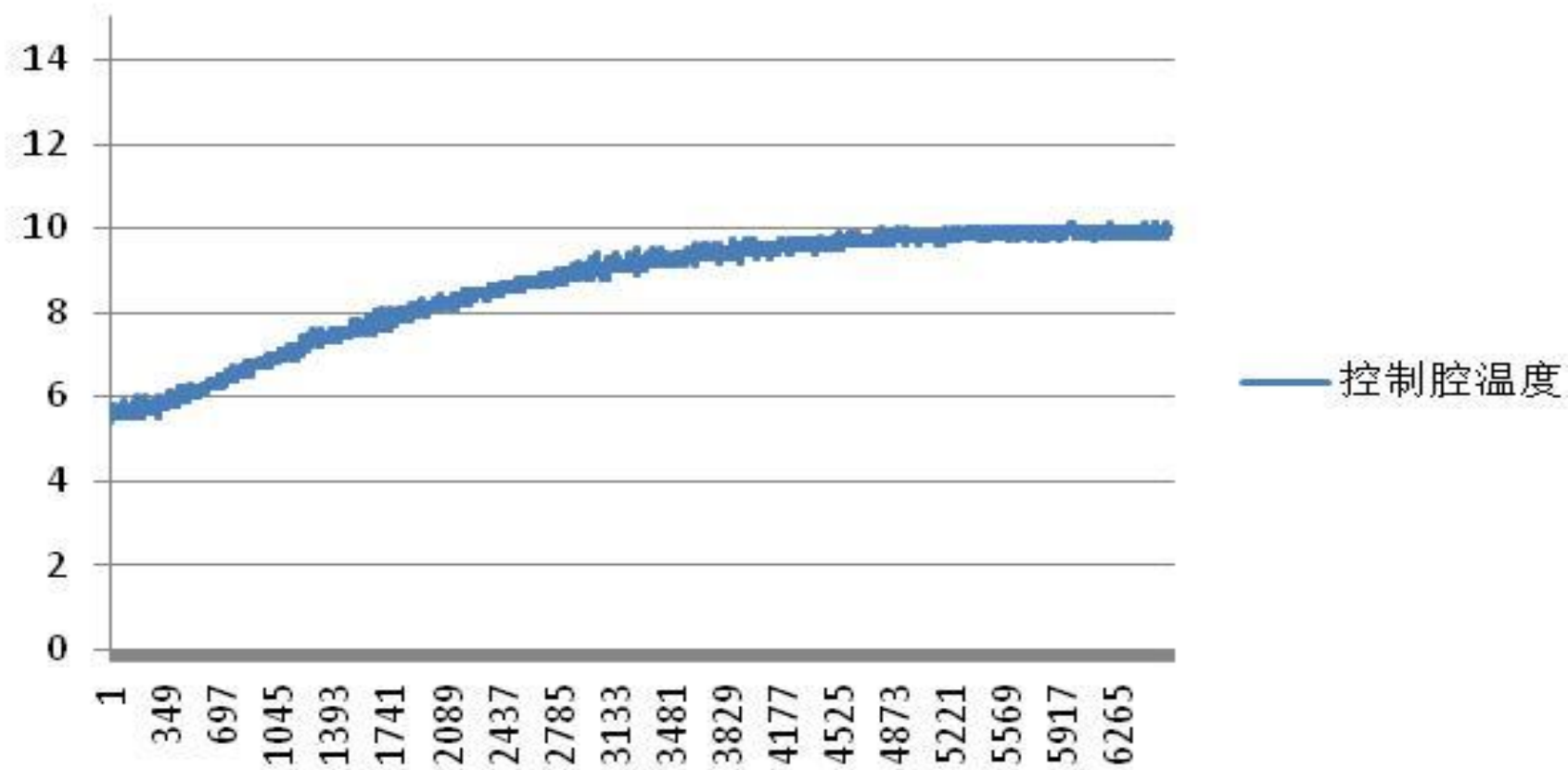
Depth: 890m



Deep Sea Trial in Monterey

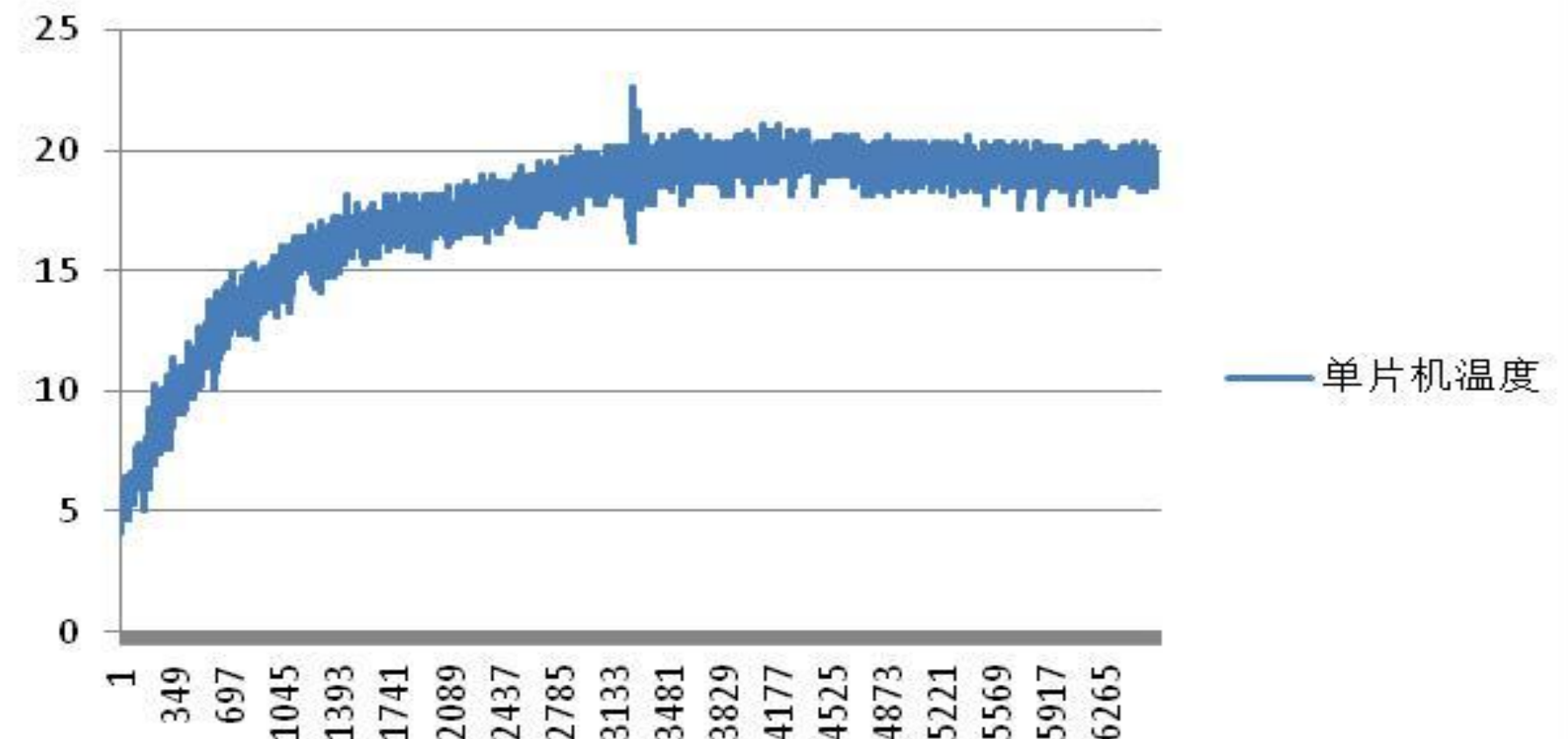
Temp Behavior from the beginning

Temperature of Vessel ($^{\circ}$ C)



Time(Second)

CPU Temperature($^{\circ}$ C)



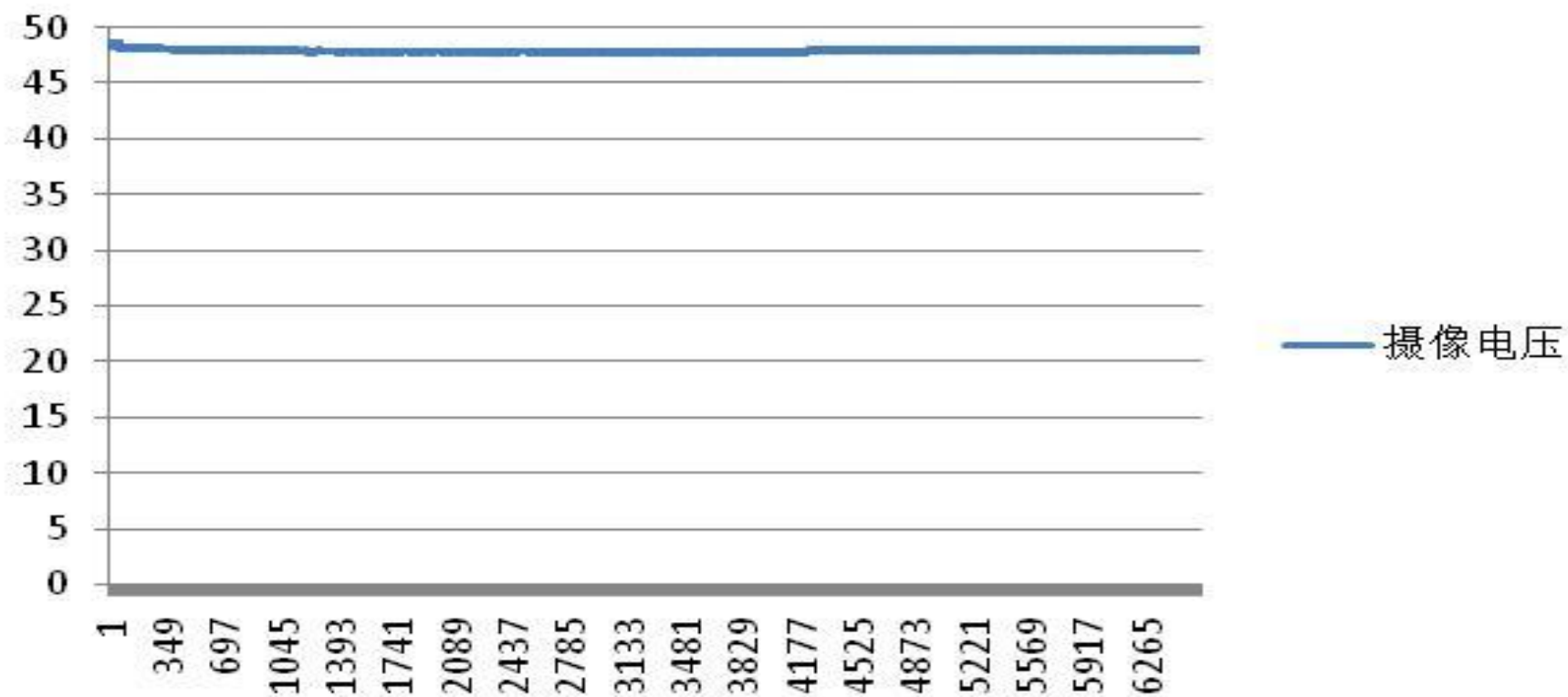
Time(Second)

Time : April, 21, 2011, 12:00-14:00
Just Connected to MARS

Deep Sea Trial in Monterey

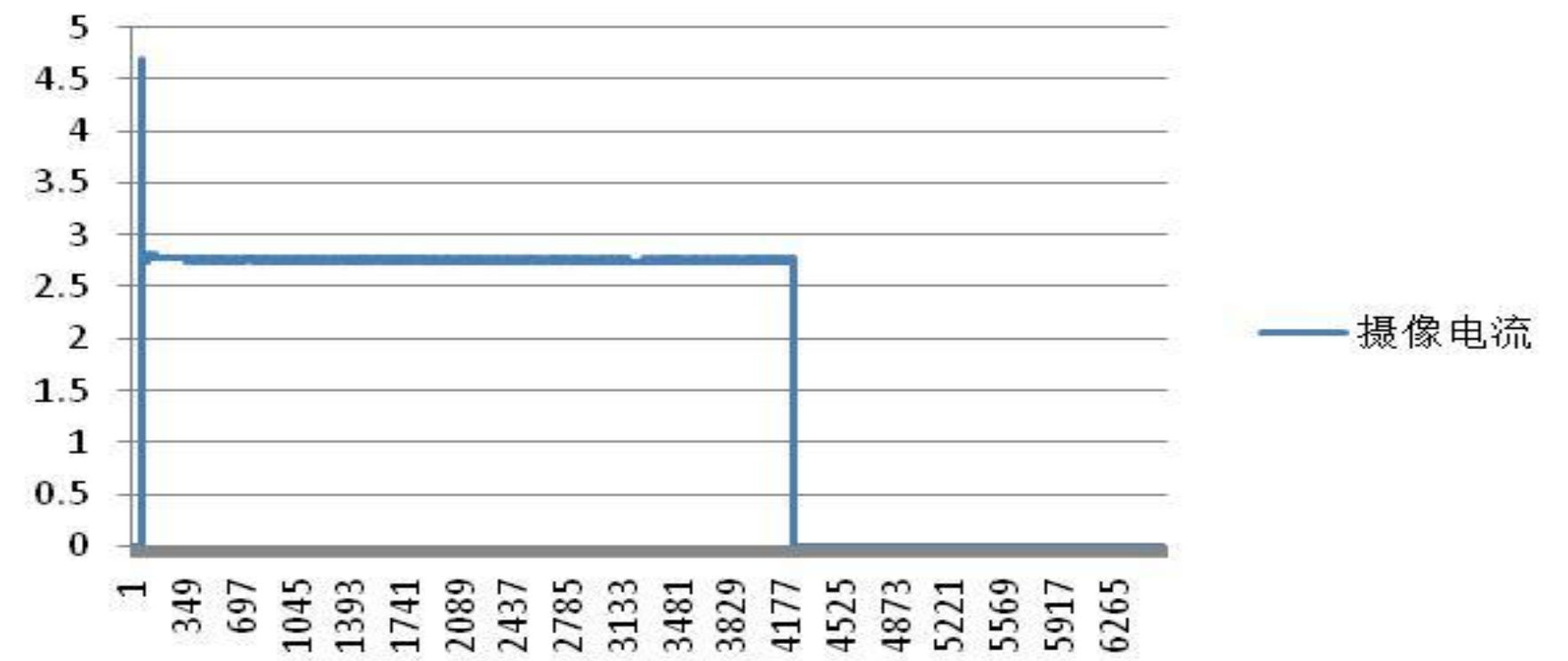
Power Status (Segment)-Camera System

Voltage(V)



Time(Second)

Current(A)



Time(Second)

Time : April, 21, 2011, 12:00-14:00
Just Connected to MARS

The Pilot Regional System in SCS

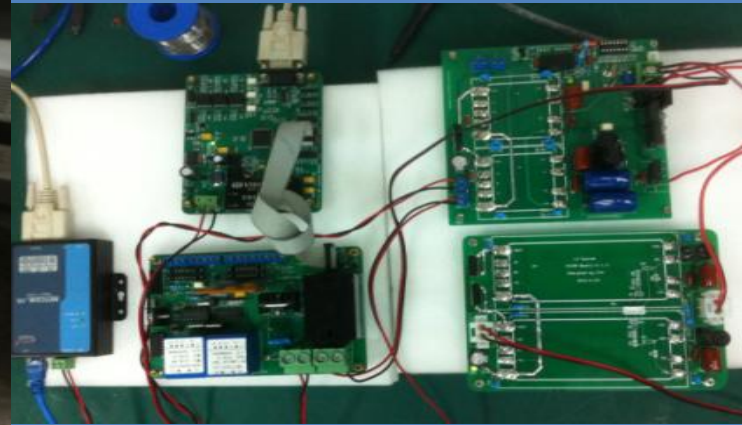
Lab Test in 2013



Shore Server



PJC



SJC



PFE



HVC



MVC

The Pilot Regional System in SCS



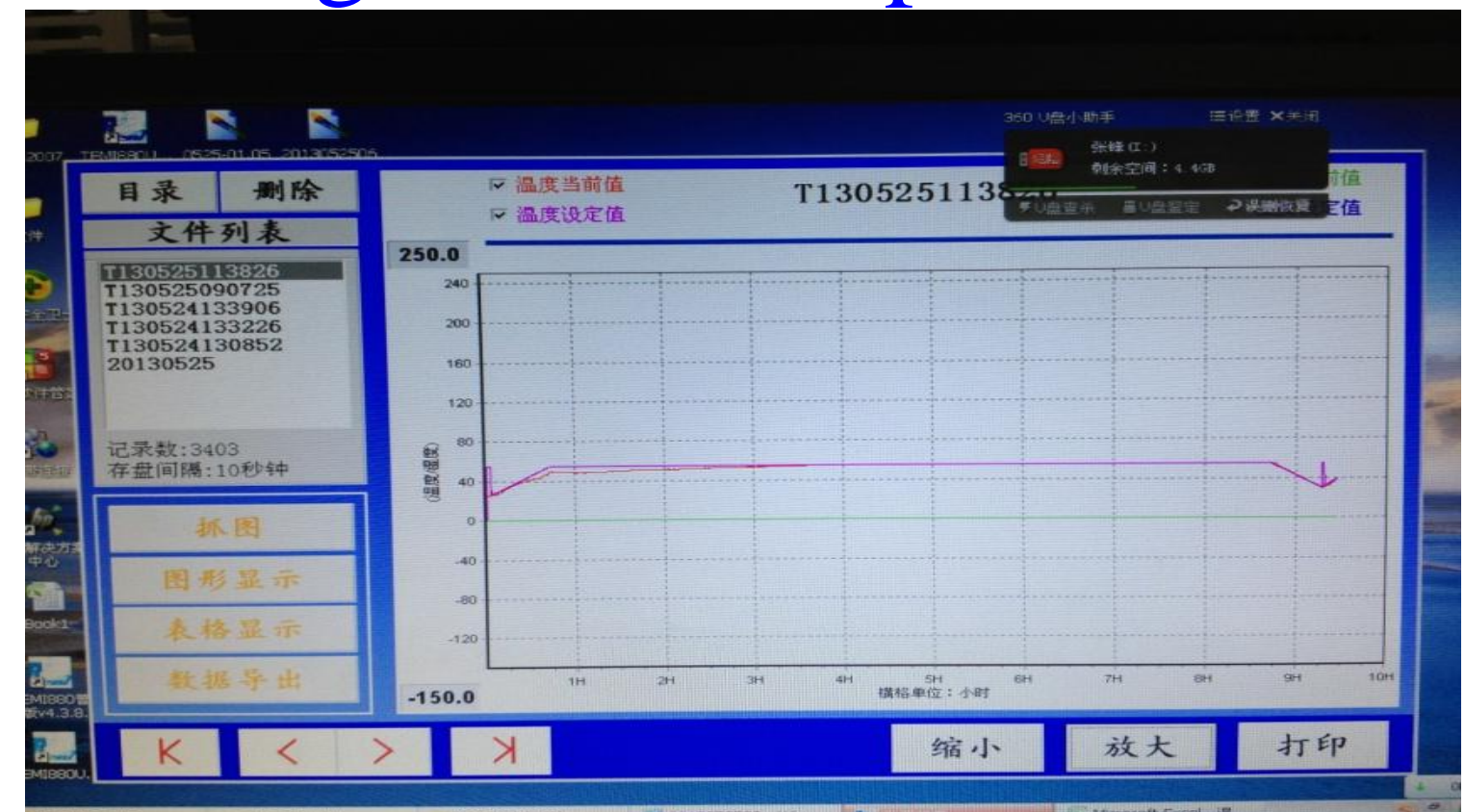
Remote control Test



Vibration Test



High-Low Temp Test

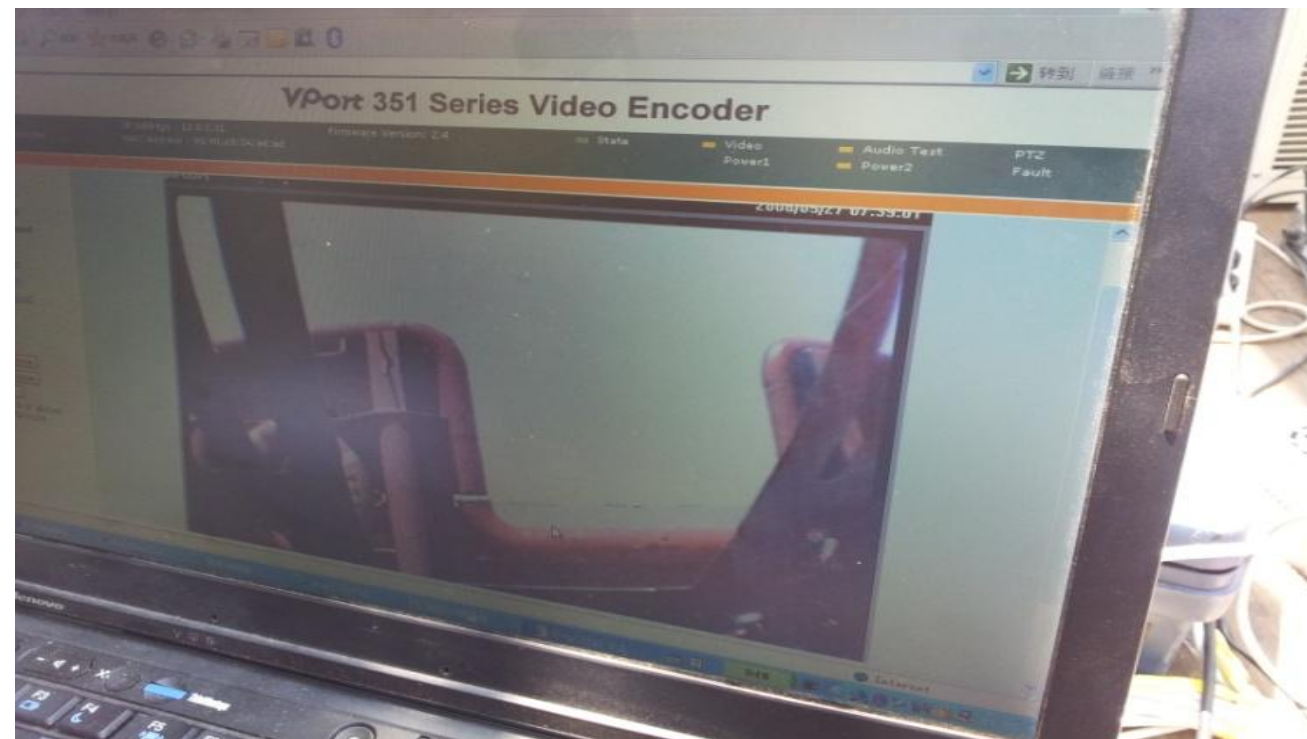


The Pilot Regional System in SCS



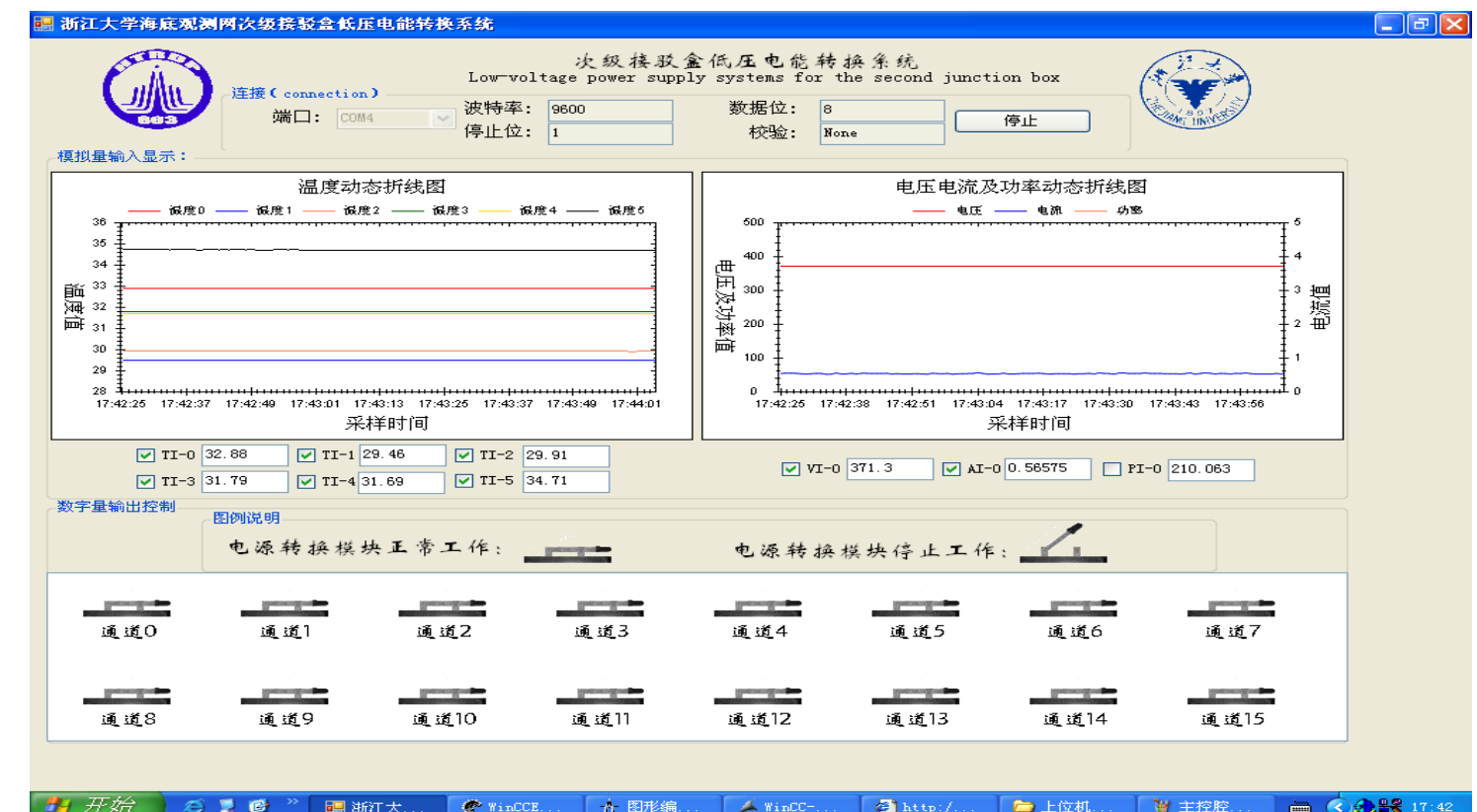
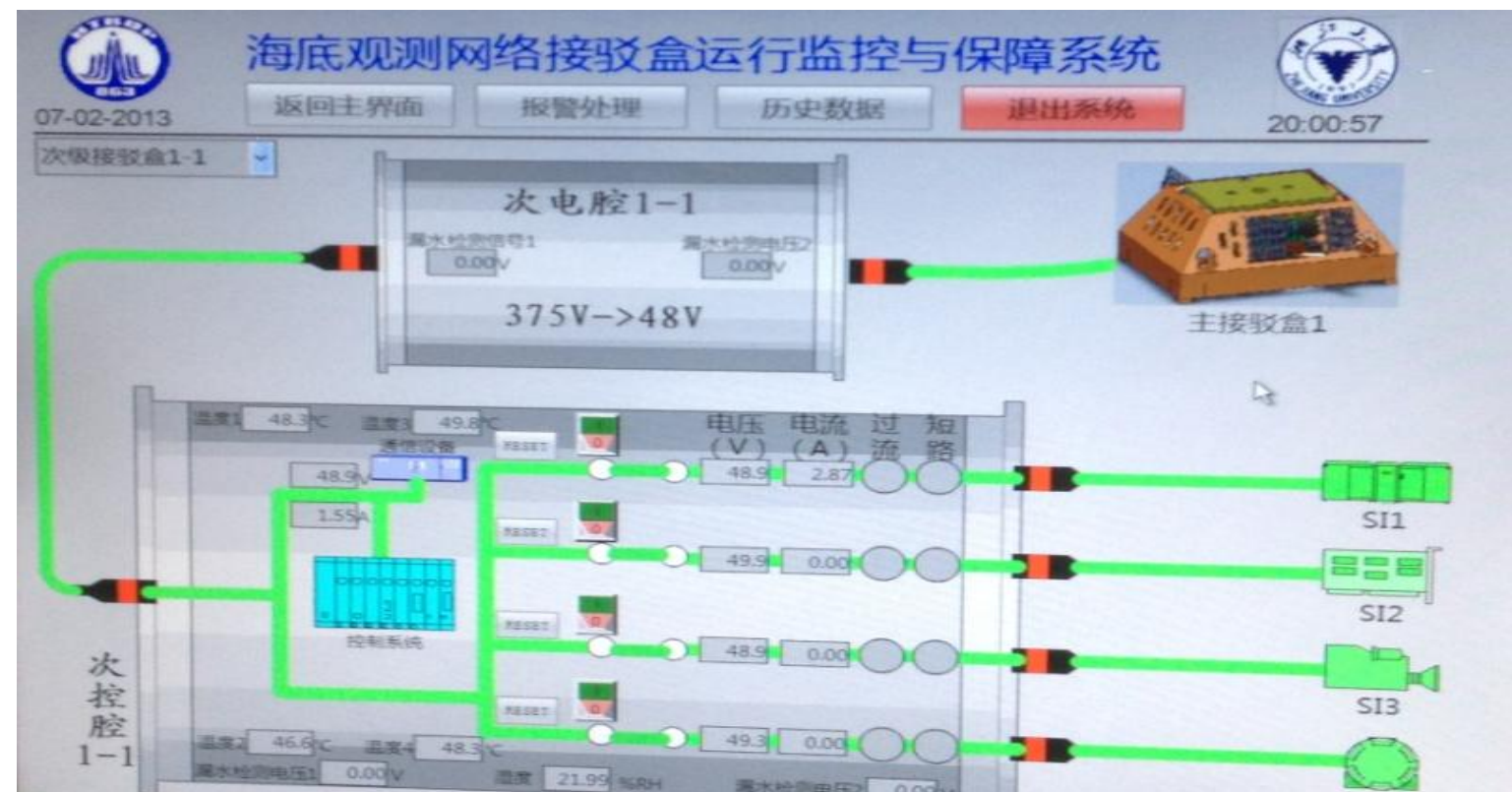
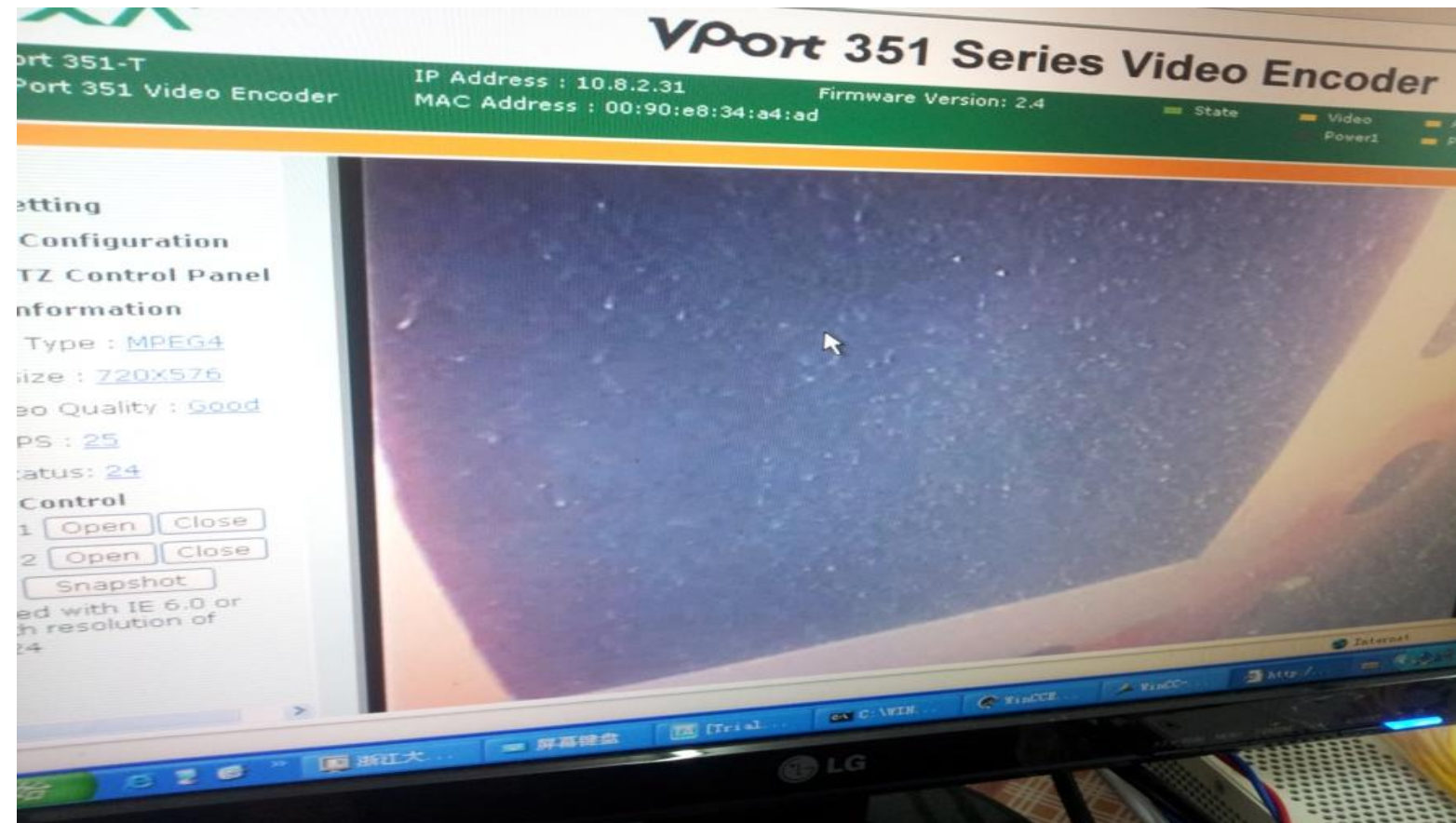
Lab Test (June 28 – July 2 2013)

The Pilot Regional System in SCS



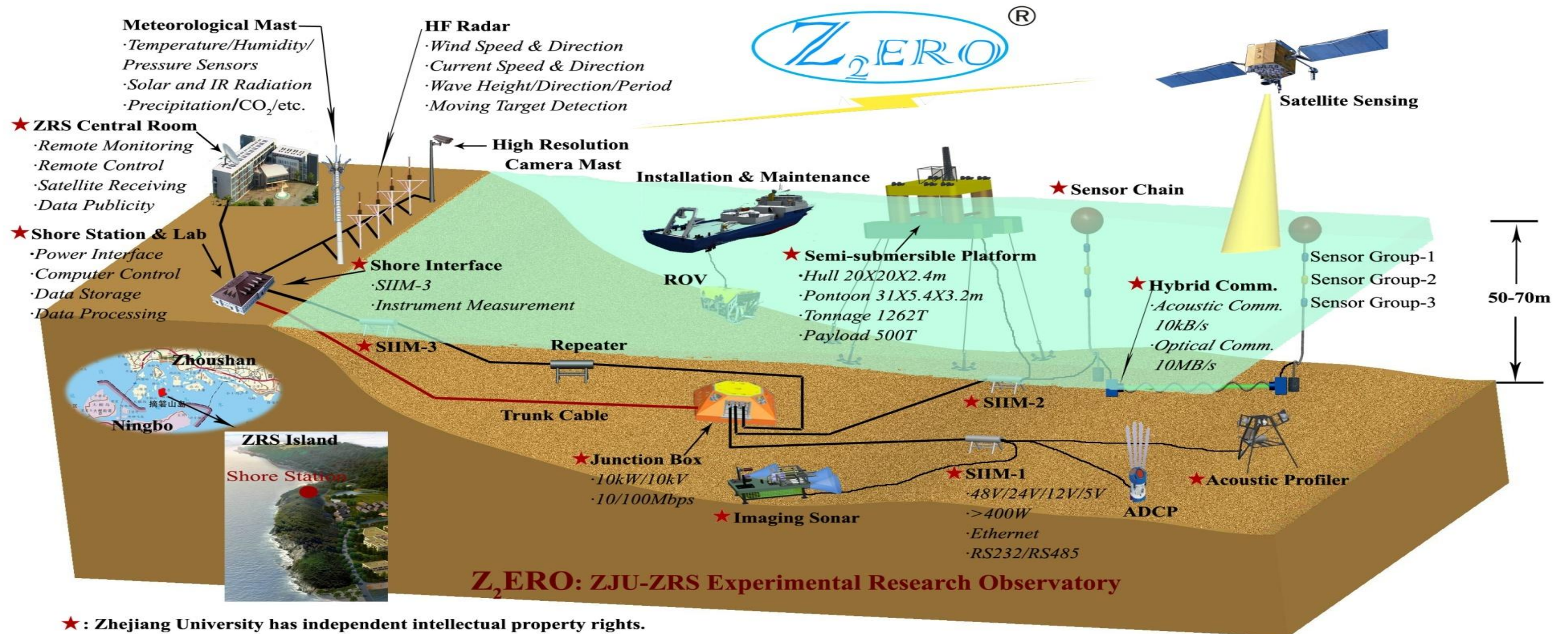
Tank Test with 75 km Submarine Cable

The Pilot Regional System in SCS



Test in SCS

The Pilot Coastal System-Z2ERO



10kV@10kW, 1 Node, 6 km, 1-3 SJboxes, Giga Comm, 30m-70m

Shanghai: Other Projects in China

2009

1.1km

15m

48V

Sanya:

2013

2km

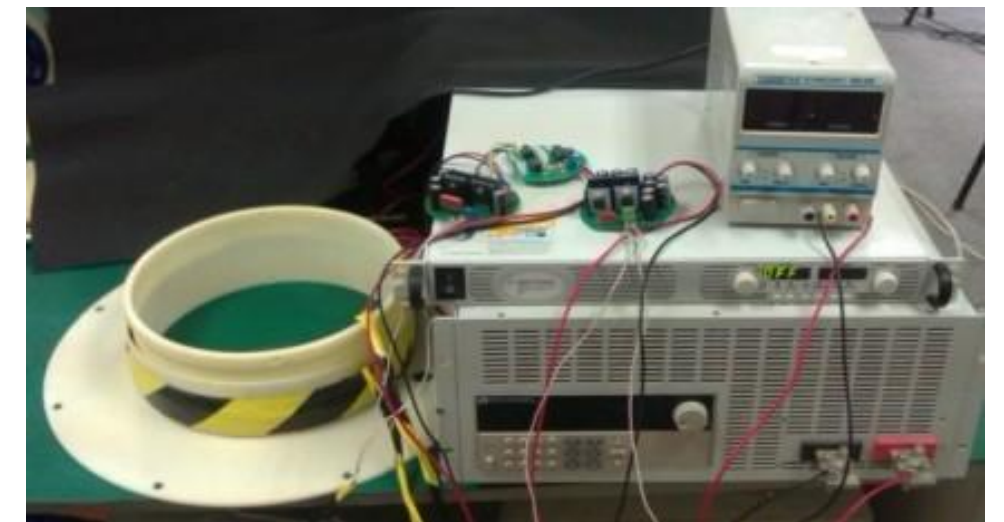
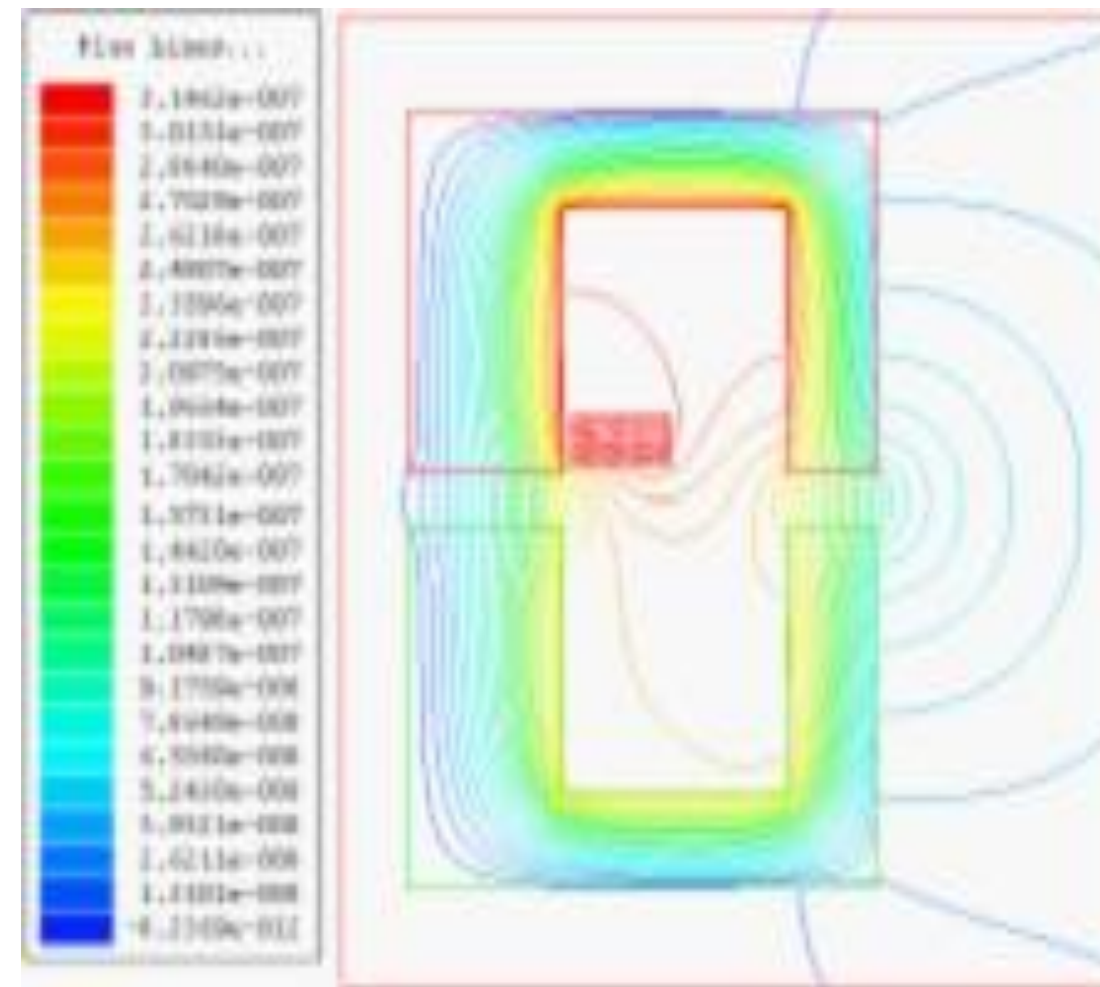
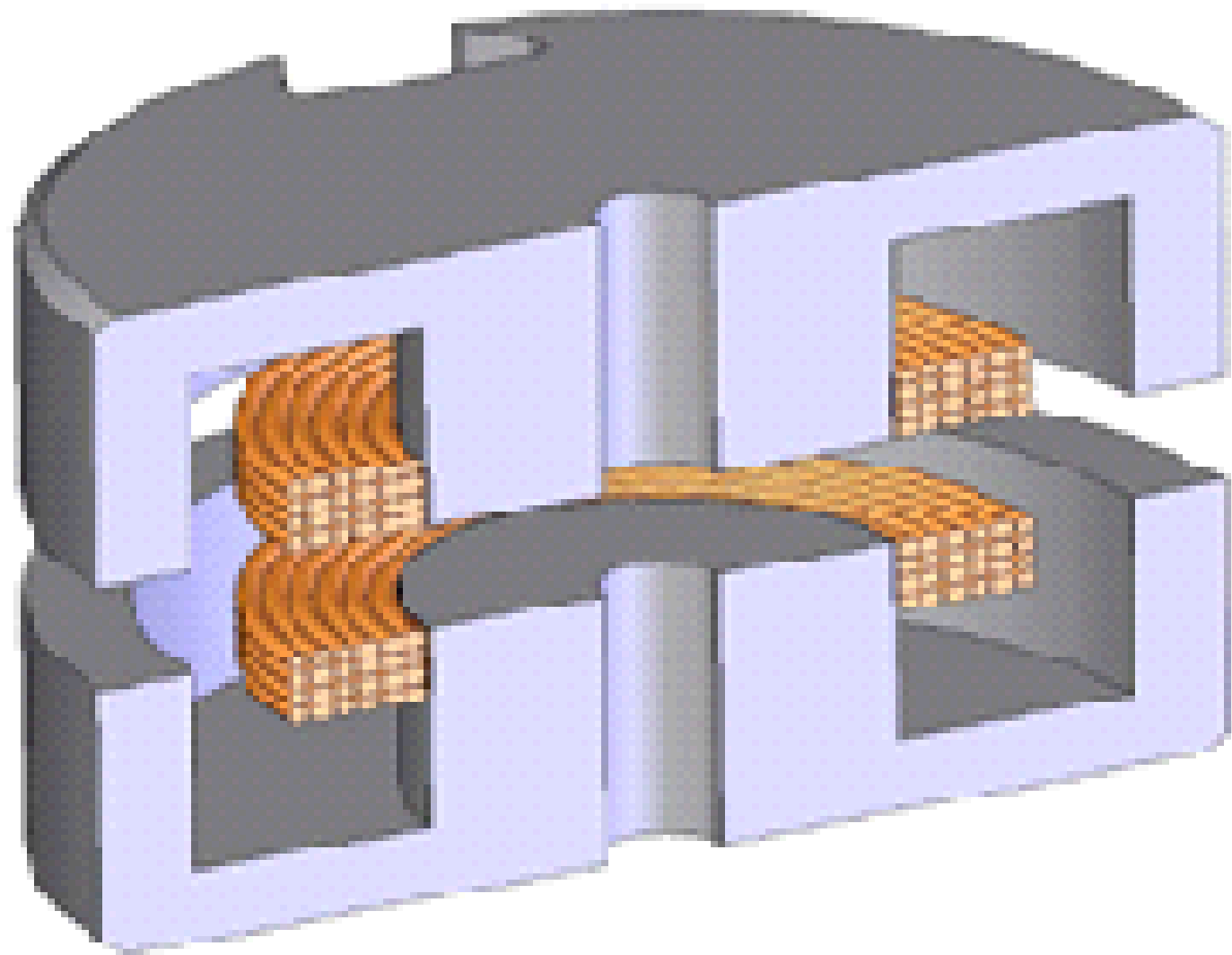
20m

10kV



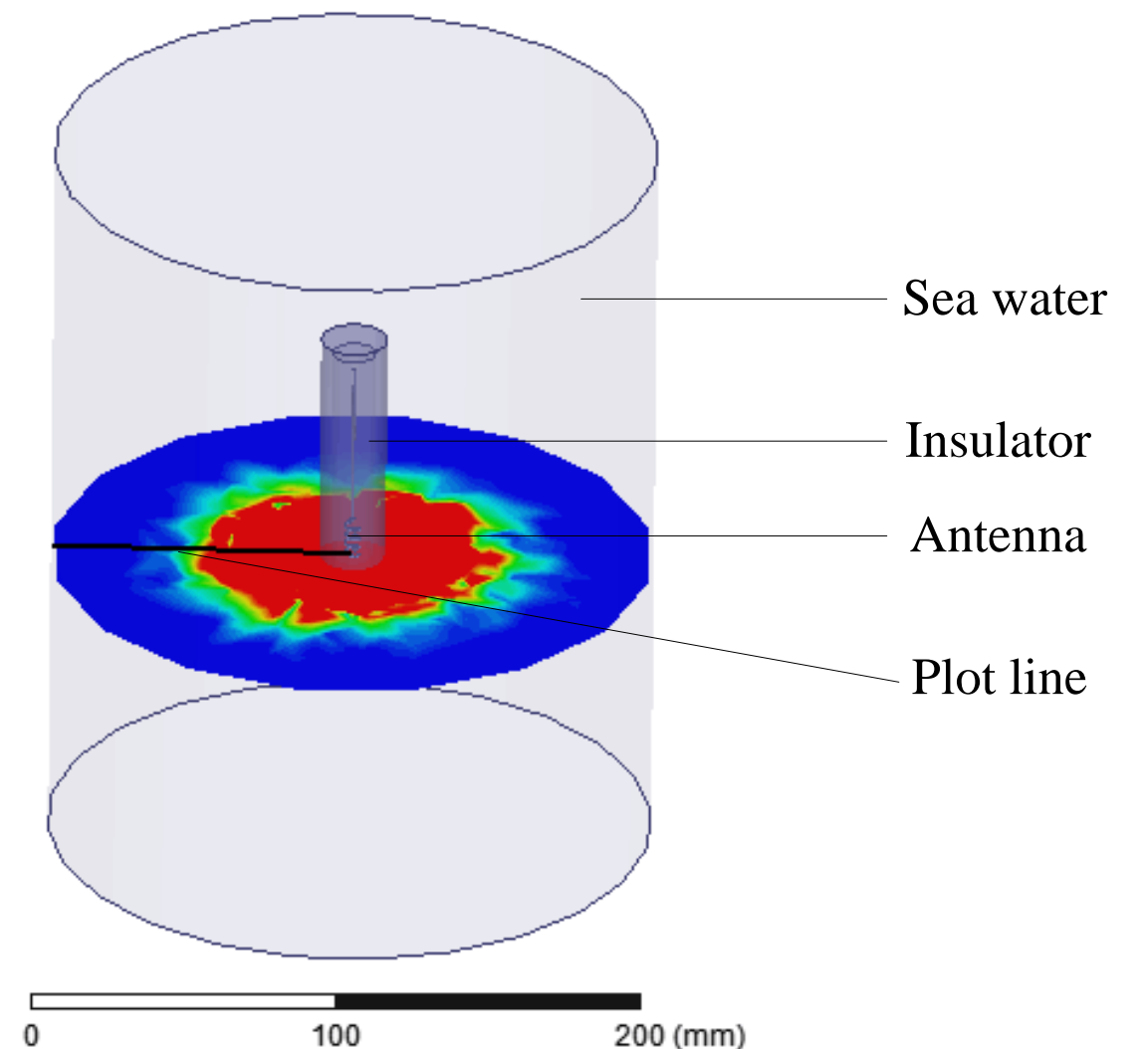
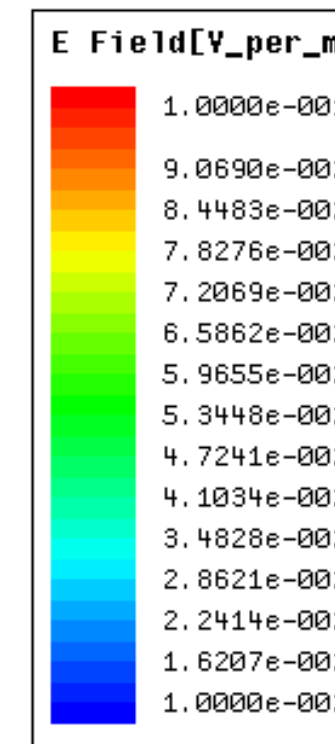
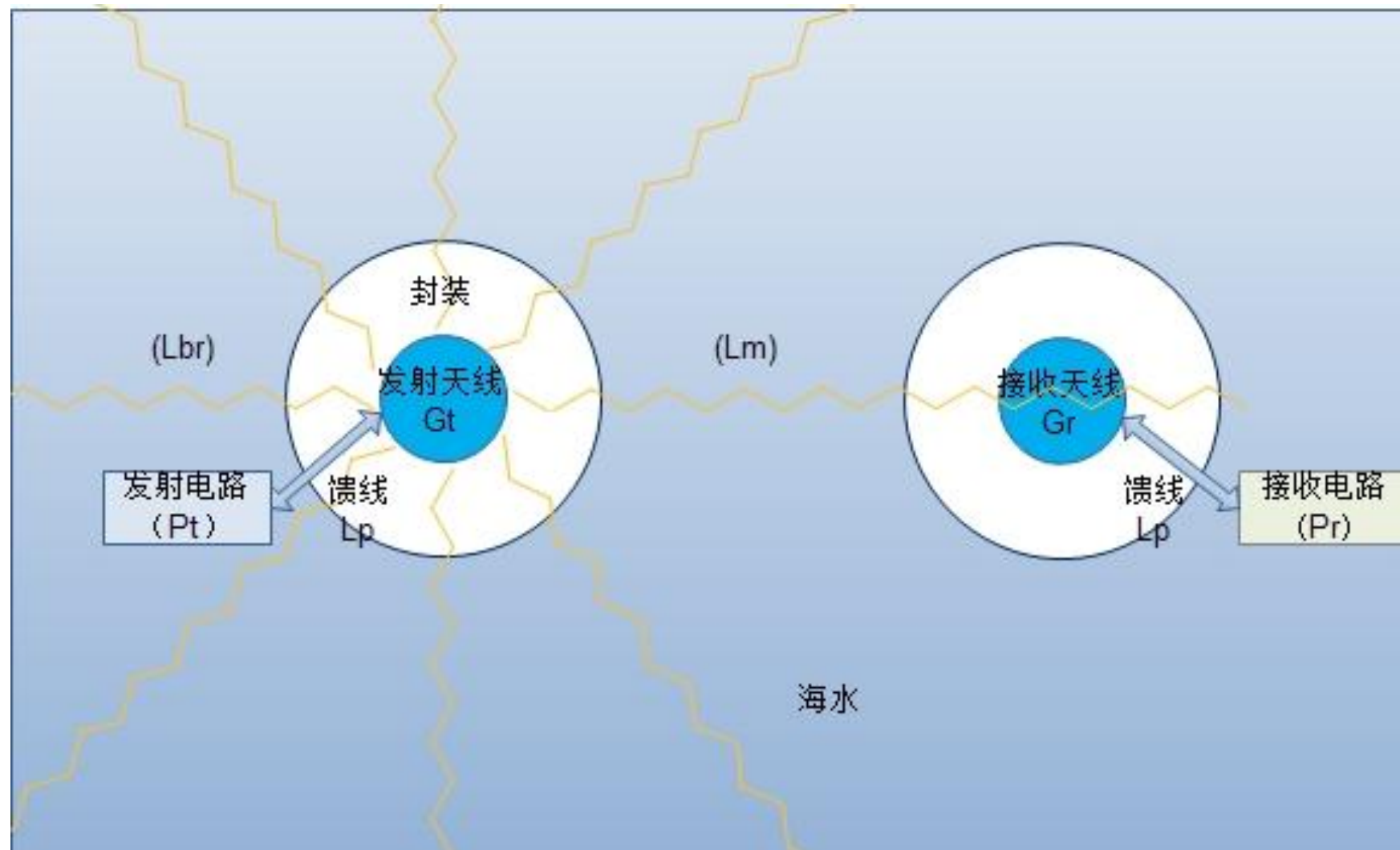
Dream in Green Cabled Observatory

1. Non-contacted Power transfer system



Dream in Green Cabled Observatory

2.Wifi information Transfer in the deep Sea



Thanks for your nice Attention



Happy Mid-Autumn Day

海上升明月，天涯共此时

Observation at the same time all over the world
when the moon is uprising from the Sea

