

# Live Cleaning Maintenance of Mining Motor & Electrical Equipment

Fujian Tengdajie Environmental Protection Engineering Co., Ltd.



**TENG DA JIE**

1

Equipment scene  
distribution

2

Contamination accident  
hazards

3

Application of motor and  
electrical equipment

4

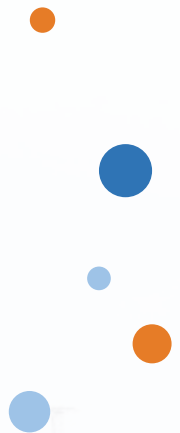
Product solutions

5

Product features  
and advantages

6

Successful  
application cases





# Equipment Scene Distribution







## Mine power supply equipment

The importance of power supply equipment to the mine



The mine power supply system is composed of all levels of substations and power distribution lines of various voltage levels in the mine. For mine power supply systems, two typical methods are generally used: deep shaft power supply system, shallow shaft power supply system and flat tunnel power supply system. The mine power supply system is composed of all levels of substations and power distribution lines of various voltage levels in the mine. For mine power supply systems, two typical methods are generally used: deep shaft power supply system, shallow shaft power supply system and flat tunnel power supply system. However, due to the particularity of the mine environment, the underground power equipment is undoubtedly operating in a very challenging environment-**humidity, dust, gas!**





## Mine electrical equipment

The importance of electrical equipment to the mine



The main use scenarios of mining electrical equipment are divided into: lifting and transportation equipment, ventilation and compressed air equipment, water supply and drainage equipment, etc. This type of equipment belongs to long-term continuous working equipment, which is seriously polluted, generates high heat, and is often worn. Maintenance is required, but it is one of the types of equipment with relatively scarce treatment methods, which adds many difficulties and risks to daily equipment maintenance.



Two

# Contamination Accident Hazards





## 2

# Contamination Hazards



## Oil and dust are major contaminations



All kinds of electrical and electronic equipment are polluted by oil, dust, metal particles, acid and alkali salts in the environment during long-term use, which may lead to failures, which will lead to casualties and power outages.

## Hazards

The accumulation of harmful pollutants in equipment can easily lead to the reduction of insulation, short circuit and increase of current leakage. When the temperature rises, the probability of soft failure increases, and the possibility of causing flashover, pollution flashover and other hazards increases. Serious cases lead to large-scale blackouts, and even fire disasters.





单相电机因没有启动  
起来，堵转的结果，  
导致电机运行6-7  
分钟，30秒足以  
烧毁电机绕组，2分钟  
足以烧毁运行绕组  
电机烧毁吧！也就是  
转圈之间的事，真实的  
事故现场，够震撼吧！

## Oil and dust are the main pollutants

- (1) The coil is corroded and covered by grease and other dirt, causing the coil to age and overheat;
- (2) The ventilation part of the air-cooled motor is blocked by dirt;
- (3) Motor coil overheating caused by motor overload operation;
- (4) The bearing is overheated due to poor installation and lubrication;
- (5) The brush is ignited to ignite the dirt on the motor;
- (6) the contact is loose and ignites the dirt on the motor;

## Harm

Among the failures and fires of electrical equipment, 20% are caused by the motor.

This is because the daily maintenance of the motor is not good enough, and due to various reasons, the motor ignites and ignites combustible materials around the motor.

2

## Contamination Hazards



**Casualty  
Accident**

**Blackout  
Accident**

**Equipment  
Damage**

**Safety  
Risks**

Every year, all kinds of large and small electric accidents caused by contamination in the country lead us to think deeply...

**Ensuring safe  
production is  
our biggest  
challenge**

## Traditional maintenance methods

### Artificial cleaning

#### Imperfect decontamination

Incomplete cleaning,  
low efficiency, off  
power operation

### Live washing using water

#### Narrow application Field

Complicated  
operation , pollutants  
will affect dynamic  
insulation, not suitable  
for indoor equipment.

### Live washing using chemicals

#### Low safety factor

Chemical stimulation,  
toxicity, harmful,  
corrosive equipment,  
most products are  
flammable

Safety Low

Efficiency Low

Effect Poor

Timeliness Poor



2

User  
Demand

As a special work of mine power protection, it is difficult to  
**cut off power for maintenance** during mining

**On the premise of ensuring safe operation**

Is there a product or service that can solve pollution and avoid the harm  
caused by pollution to equipment!

Non-  
Corrosion

Non-Toxic  
Harmless

Safe  
Reliable

Strong  
Detergency

2

## Customized Solution

Users can use a variety of products and services combination according to their own conditions.



### Physical cleaning

Mainly for heavy pollution equipment such as outdoor insulators



### Live cleaning

Mainly for the large number of equipment, large equipment, serious pollution, regular maintenance



### Live protection

It mainly provides long-term protection for equipment, and it can protect the equipment from water, salt spray, dust, oil and other pollutants in the environment.



### Rust-proof lubrication

It can loosen rust, anti rust, lubricate, dehumidify and clean metal parts. Simultaneous long-term rust proof.



### Self maintenance using canned product

Mainly for the small number of equipment, small equipment, light pollution, and user self-maintenance.

**Multiple choices will solve more problems for users  
Customization will be more targeted to the problem**



Three

# Application of motor and electrical equipment





3

# Applications

Transform



Distribution



Communication



Transmission

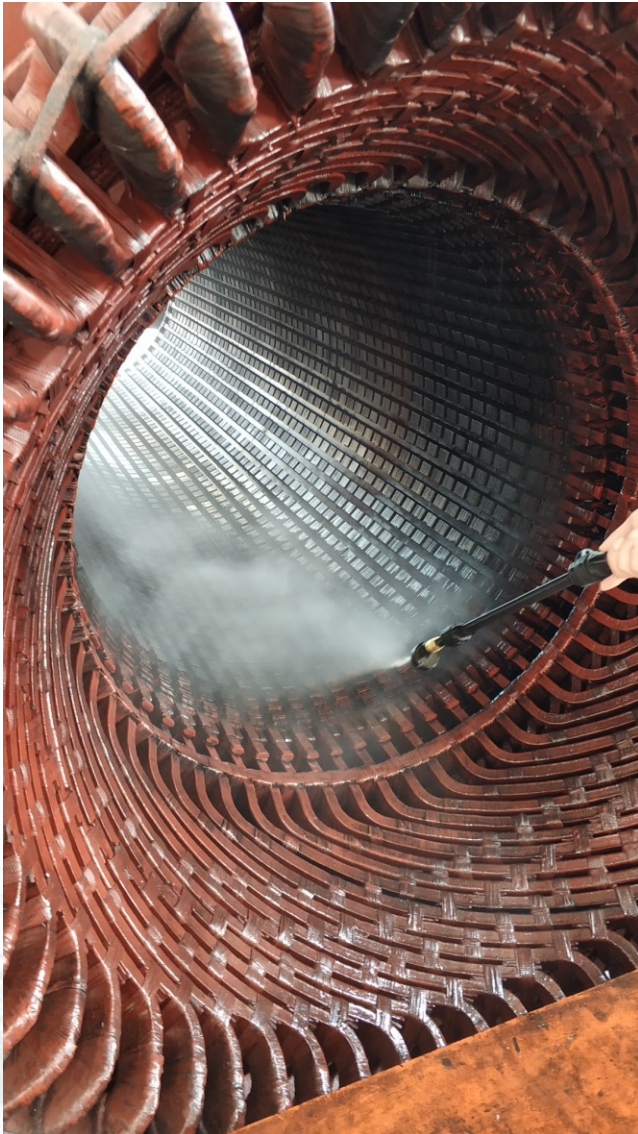




3

## Applications

Dust  
cleaning  
of motor  
stator



Rotor oil  
and dust  
cleaning



Shell oil  
and dust  
cleaning





Four

# Product Solution





4

## Contamination Solutions

# Modern safety maintenance method

## Live cleaning maintenance service

No corrosion  
Non-corrosive to  
equipment components

Non-toxic harmless  
Volatile without  
residue

Safe reliable  
Dynamic insulation is relatively  
close to static insulation

Good detergency  
All-round removal of oil  
and dust pollution

4

## Maintenance Method

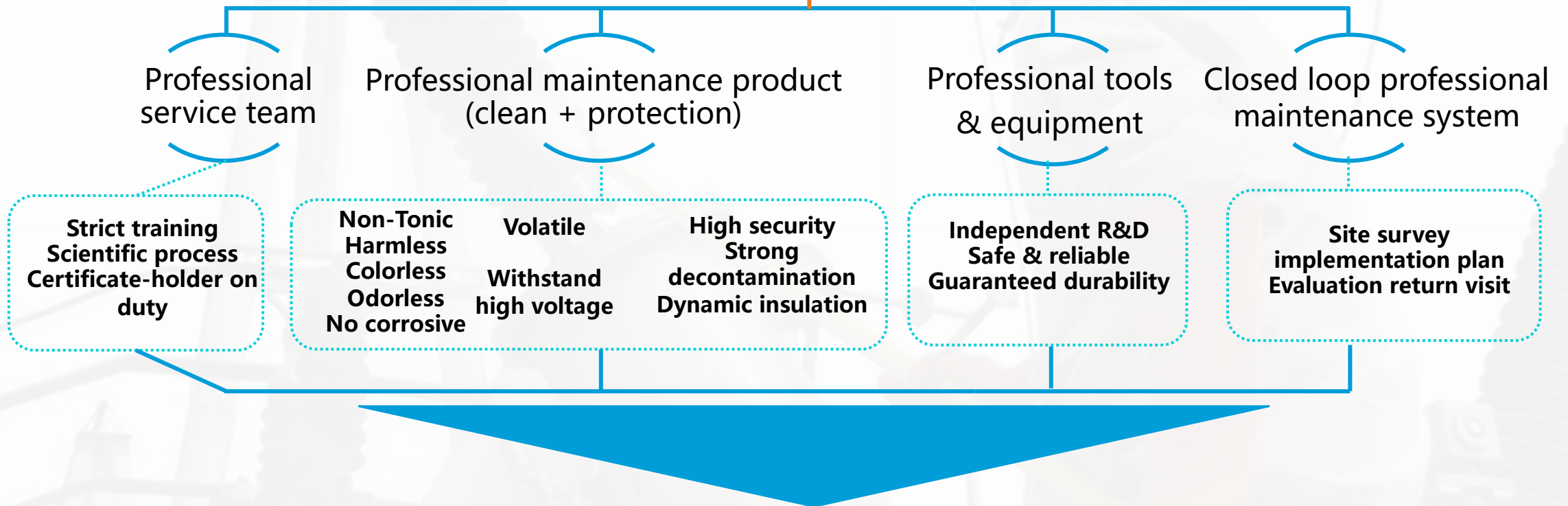
**Customer** self service  
(Product sale)



**TDJ** Regular on-site service  
(project implementation)

**Project implementation method:** Provide customers with comprehensive solutions for new materials technology application products, and provide professional on-site service in the form of projects.

**Canned sales method:** Canned package new material technology application products, improve the practicability and ease of use of the products, unify the product use standards, and improve the self-maintenance ability of end users.

**TDJ regular  
maintenance plan**

● **The best safe efficient market choice**



## 4

# Maintenance Targets

## TDJ live Maintenance

The professionally trained technicians select special maintenance cleaning agents and tools, follow TDJ live maintenance safety guarantee system, and carry out the maintenance cleaning work under the live operation state of the electric power equipment according to the actual conditions of the equipment.

Safe

Non-Toxic

## TDJ live Maintenance Process

- Live test
- Physical cleaning
- Dissolution decontamination
- Nanomaterial protection
- Live retest

Anti corrosion

Anti oxidation

Anti salt fog

Moisture-proof

Leakage prevention

Anti static

Rust-proof lubrication

**Restore the optimal operating state of the equipment to make the device safe and easy to run**



Five

## Product Advantages



## 5

## Comparison

|                    | Artificial cleaning | Live washing using water | Live washing using chemicals | Live cleaning by TDJ |
|--------------------|---------------------|--------------------------|------------------------------|----------------------|
| Clean effect       | ★                   | ★★                       | ★★★★★                        | ★★★★★                |
| No corrosion       | ★★★★★               | ★★★★★                    | ☆                            | ★★★★★                |
| Non-toxic harmless | ★★★★★               | ★★★★★                    | ☆                            | ★★★★★                |
| Withstand voltage  | ☆                   | ★★                       | ★★★                          | ★★★★★                |
| Static insulation  | ☆                   | ★★★★★                    | ★★★★★                        | ★★★★★                |
| Dynamic insulation | ☆                   | ☆                        | ★★★                          | ★★★★★                |

★ is lowest score  
 ★★★★★ is highest score  
 ☆ is zero score

To the greatest extent, it meets the user's requirements on decontamination effect, non-corrosive, non-toxic, harmless, safe and reliable.



**Dynamic insulation**

Different from chemical cleaning and water live cleaning, TDJ cleaning agent has dynamic insulation, which can keep the equipment insulated at all times, thus improving equipment safety. The curing agent can wrap the dust particles on the equipment to ensure safe insulation.

Applicable voltage  $\leq 500KV$ .

**Good Detergency**

Cleaning agent has strong encapsulation and removal effect on pollutants such as oil, dust, metal particles, acid, alkali and salt.

**Safe  
Reliable**

**Non-Tonic  
Harmless**

**Safe**

**Good  
Detergency**

**No  
Corrosion**

**Non-Tonic  
Harmless**

Non-toxic, odorless and controllable volatility

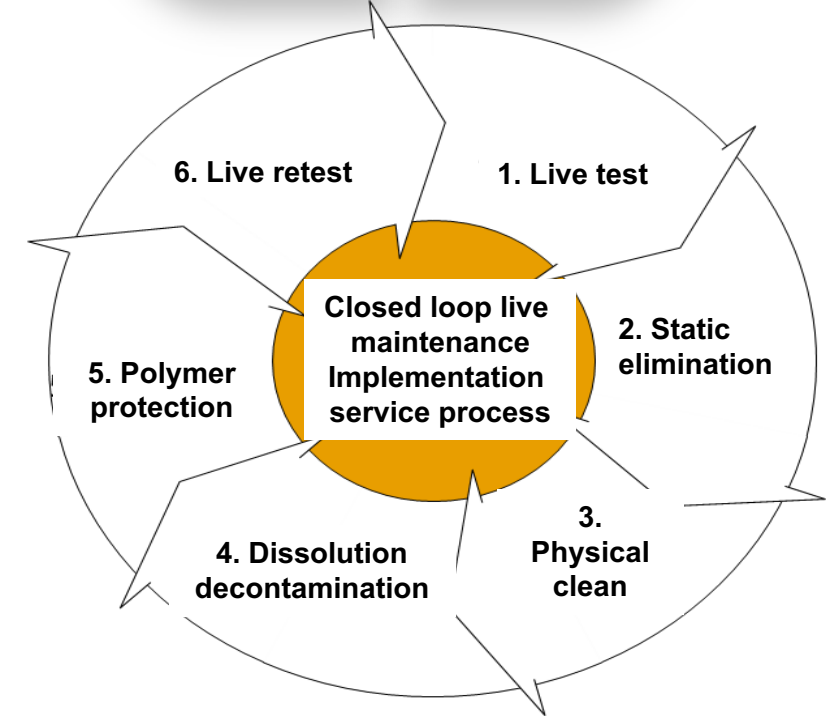
**No Corrosion**

Cleaning and curing agent will not produce chemical reaction to metal and rubber on the surface of equipment, and will not affect the operation of equipment.

# 5

## 5A Safety Guarantee System

1. Live maintenance mainly includes live cleaning and live protection. It is used to solve the safety problems of various kinds of equipment, to solve the hidden safety problems, faults and energy consumption problems caused by static electricity, dust, salt, moisture and temperature in long-term operation equipment, and to solve the problems of power off, high difficulty and incomplete treatment in traditional equipment maintenance methods.
2. Live maintenance service is subverted, using live maintenance products and services (professional operators use our products and tools strictly in accordance with the company 's six major implementation of the service process, 5A security system to provide services to customers) are concise, efficient and thorough to remove all kinds of pollutants, eliminate all kinds of potential safety hazards and ensure the equipment safety.
3. Good effect of improving operation efficiency, prolonging service life and reducing energy consumption of equipment operation while fully running



5

## Product Safety Guarantee

### Product

#### Drum package

Power electric equipment live  
cleaning detergent

OLC-10-B OLC-35-B OLC-110-B

OLC-220-B OLC-330-B OLC-500-B

Electric equipment live protective agent

CP-01 CP-98

#### Canned package

Flame retardant electric equipment cleaning  
detergent

OLC-10

Electric equipment live protective agent

CP-001

Anti-Rust lubrication agent

RPL-01

### Test & Insurance

TengDaJie product characteristics and  
protective agent waterproof  
Qualified by the following laboratory



China CEPREI laboratory

TengDaJie products are tested by the  
following laboratory (toxicity and safety)



Applied Toxicology Institute  
Nanjing Medical University

TengDaJie products are insured by Pacific  
Insurance Company



The withstand voltage value of  
TengDaJie products is tested by the  
following laboratory



Power Industry Electrical Equipment  
Quality Inspection and Testing Center



5

# Safety Guarantee of Tools & Equipment

| No. | Process  | Tools & Equipment Name List  |
|-----|--|--|
| 1   | Live Test  | Non-contact Infrared Thermometer, Electrostatic Measuring Instrument, Wind Speed Measuring Instrument, Infrared Thermal Imaging Instrument |
| 2   | Static Balance   | Static Balance Instrument  |
| 3   | Physical Cleaning  | Column Type Insulator Maintenance Tool   |
| 4   | Dissolution Cleaning<br>Insulation protection<br>Antistatic protection | Live Maintenance Machine for Electric Equipment<br>Portable Spray Gun<br>Insulation Gun for High Voltage Power Equipment Maintenance       |
| 5   | Physical collection  | Special Suction Collection Machine for Live Maintenance  |

- Tengdajie engineers independently R&D
- 12 utility model patent certificates
- Annual professional withstand voltage test

TDJ

Tools Equipment Instruments

# 5 Technical Service Personnel Guarantee

Tengdajie Technical Service Personnel

National Professional Certificate

Special Operation Certificate  
-Safety production supervision authority  
Certificate of Working at Height  
-Safety production supervision authority  
Qualification certificate for charged water washing and electrification cleaning of power transmission and transformation equipment of 220kV and below  
-China Electric Power Research Institute

Carry out maintenance work strictly according to Tengdajie live maintenance operation standard

1

Pass

2

Exams



Expert guidance

3

Certificate-holder on duty

4

Tengdajie Live Maintenance Standard" Training and Qualification Assessment

Safety education for cleaning and maintenance technicians before taking up positions

5

## Process Safety Guarantee

Reference to  
relevant  
national  
standards



Combined  
with practical  
project  
experience



"Tengdajie high and low voltage distribution  
equipment live maintenance procedures"  
"Tengdajie transmission and transformation  
equipment live maintenance procedures"

**Electrostatic  
balance process**

Using Electrostatic Balancer to Eliminate Accumulated Electrostatic of Equipment

**Live cleaning  
process**

Live Cleaning and Maintenance Suitable for External Electric Insulation Equipment

**Atomization  
Maintenance  
process**

Suitable for thick dirt, first atomizing and curing, then infiltrating, thoroughly decomposing dirt

**Dissolution  
Maintenance  
Process**

Maintenance of equipment with efficient and safe live cleaning agent

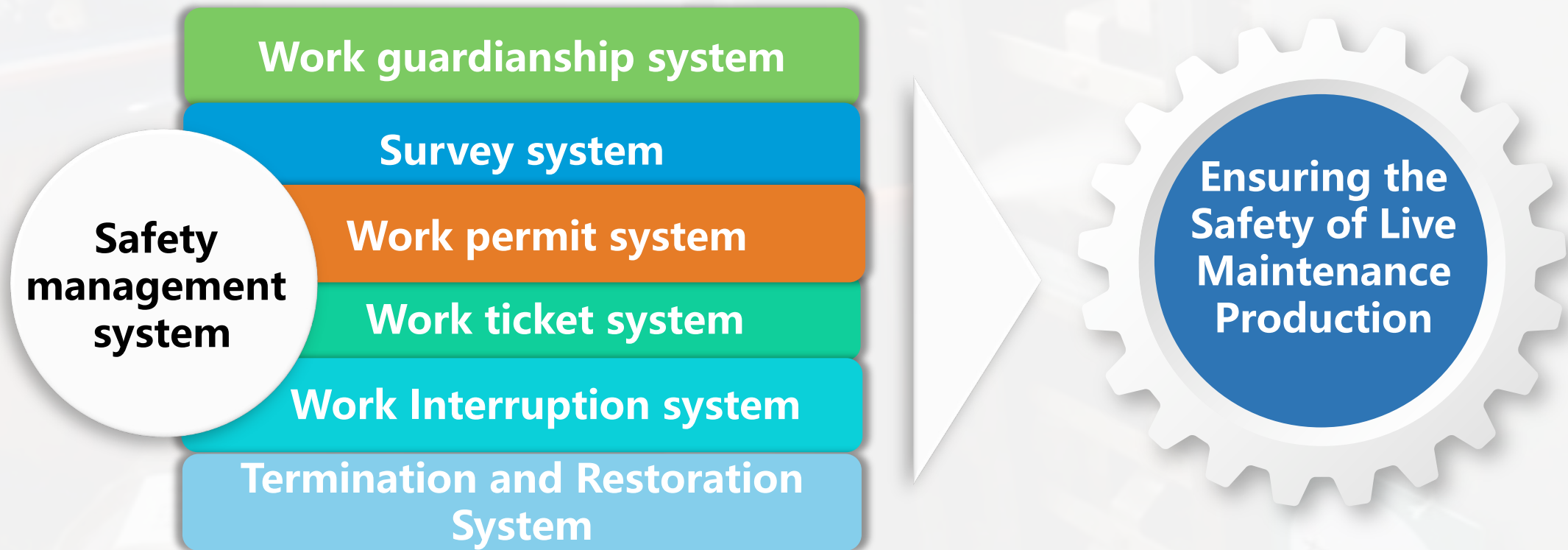
**Nanomaterial  
protection  
process**

Maintenance of equipment against acid, alkali and salt pollution, corrosion and leakage



5

## Production Safety Guarantee





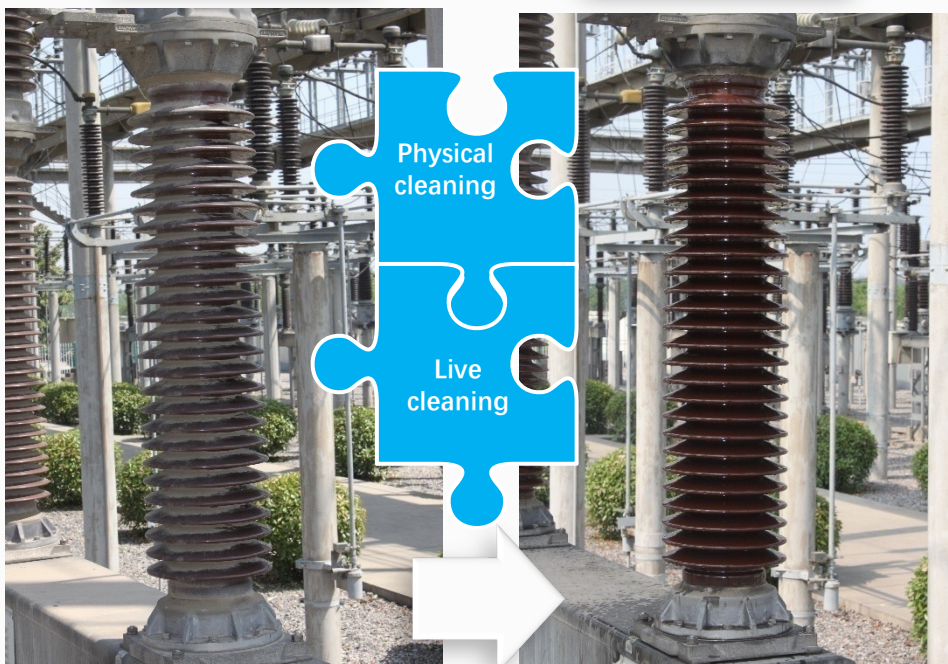
Six

Successful  
Application Cases



Before

After

**Maintenance effect:**

Through the comparison of the pictures, it can be clearly seen that the equipment after cleaning is completely new. The cleaning agent removes 90% of the pollutants on the equipment by means of dissolving, wrapping and carrying away, and restores more than 90% of the insulation of the equipment and ensure safe operation of the equipment.

## Power Plant

**Equipment environment:** Insulators are outdoors, and located at the edge of the machine repair plant, long-term contact with sand, rain, oil and gas

**Contamination:** There are a lot of dust and sludge-like pollutants the equipment surface. The outdoor equipment is seriously polluted due to exposure to the air, which is contaminated by the external inorganic matter, dust, rain and sun. Customer feedback that the device has experienced an discharge before. The insulators on the customer 's equipment are coated with anti-fouling paint during installation. The paint is aging and cracked due to contact with air and rain for a long time, and the risk of secondary construction is high. The user hopes that there is a kind of equipment maintenance service that can be safe and it can remove the surface contamination as much as possible.

**Solution: Physical Cleaning + Electrification Cleaning**

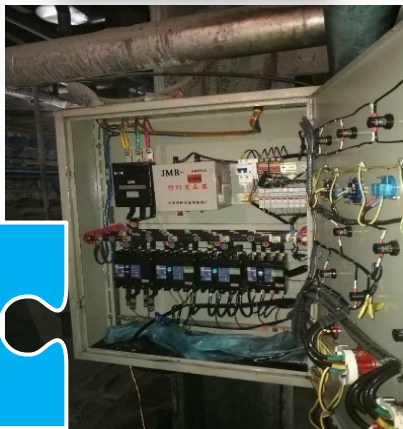
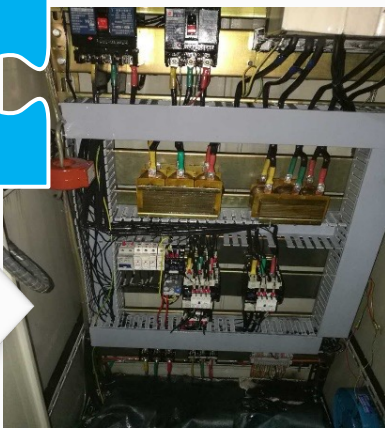
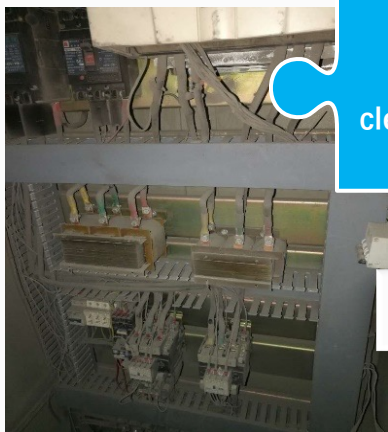
Uses self-developed tools to clean large contaminants first, and then use TDJ series cleaning agent for regular maintenance. The products used in maintenance service have the characteristics of high voltage resistance and high cleanliness. They not only meet the needs of customers, but also have the characteristics of non-corrosive equipment, fast volatilization and no residue after cleaning, colorless, odorless, non-toxic and harmless.



Before



After

Physical  
cleaningLive  
cleaning

**Maintenance effect:** entire cleaning process is live working, cleaning services washed all pollutants on the equipment surface, heat-dissipating components and cable bars, liquid volatiles quickly without residue to avoid secondary dust contamination, restore the insulation value of the equipment.

## Shenhua Ningxia Power Plant

**Equipment environment:** equipment is very close to the boiler area, long time contact with mineral powder, environmental air humidity is very low, heavy dust and mineral powder pollution.

**Pollution situation:** There are a lot of sludge contaminants on the surface of equipment, especially on the surface of cable bars, which accumulates a lot of sludge, and pollution is very heavy. The customer indicated that there had been discharge in some insulation parts of the equipment. Customer cleaning is manual cleaning with power off, which is inefficient. At the same time, equipment shutdown brings additional economic losses to the company and only removes part of the surface dust, so the improvement of equipment safety is not obvious.

**Solution: Live Cleaning + Live Protection** Electric Power Equipment Live Special Cleaning Agent Regular Maintenance Service. Maintenance service has the characteristics of live operation, high cleanliness and high efficiency. It not only meets the needs of customers, but also has the characteristics of non-corrosive, fast volatilization and no residue after cleaning, colorless, odorless, non-toxic and harmless. After cleaning, live protective agent is used, and then a protective film is formed on the surface of the equipment to isolate dust, oil pollution, water vapor and other pollutants, so as to ensure the long-term operation safety of the equipment.

Before

Live  
cleaningSelf cleaning  
using canned  
productRustproof  
lubrication

After

**Maintenance effect:**

Maintenance services remove more than 90% of the contaminants on the surface of equipment, and solve the problem of instability of equipment operation caused by dust and dust accumulation. Canned products greatly facilitate the daily inspection operation of users.

## Steel factory in Shanghai

**Equipment environment:** The dust around the distribution room is heavy, too much dust content in the air, and a nearby water treatment plant causes serious moisture.

**Contamination:** A large number of equipment connectors are corroded, and a large number of coal ash dust inside transformers cause instability of equipment operation.

**Solution: Live cleaning + canned product self-maintenance + anti-rust lubrication**

Tengdajie power electrical equipment special cleaning agent regular maintenance service, canned product flame retardant electric electrical equipment cleaning agent for self-maintenance. Because the cleaning method of our cleaning products is taken away after physical wrapping, there is no chemical stimulation and no corrosion to equipment. And the cleaning agent can live cleaning, non-toxic and harmless, it meets the needs of customer for cleaning equipment.

Canned products are highly safe, flame retardant and easy to operate, making it easy for users to use for their own daily maintenance.

After using anti-rust lubrication products, mechanical equipment operates more smoothly, and forms a protective film to prevent the corrosion of equipment caused by pollutants such as moisture.



6

## Benefits for Equipment

**High and low voltage distribution equipment, transmission and transformation equipment, control equipment**

1

### Dust removal

Removal of surface and deep contaminants from equipment

3

### Restore insulation

Restore to **90%-95%** of original insulation value

5

### Slow down corrosion

Anti-corrosion protection of equipment, slow down corrosion speed after equipment cleaning

2

### Decrease temperature

Maximum decrease internal temperature **15%-40%**, internal average temperature **10%-30%**

4

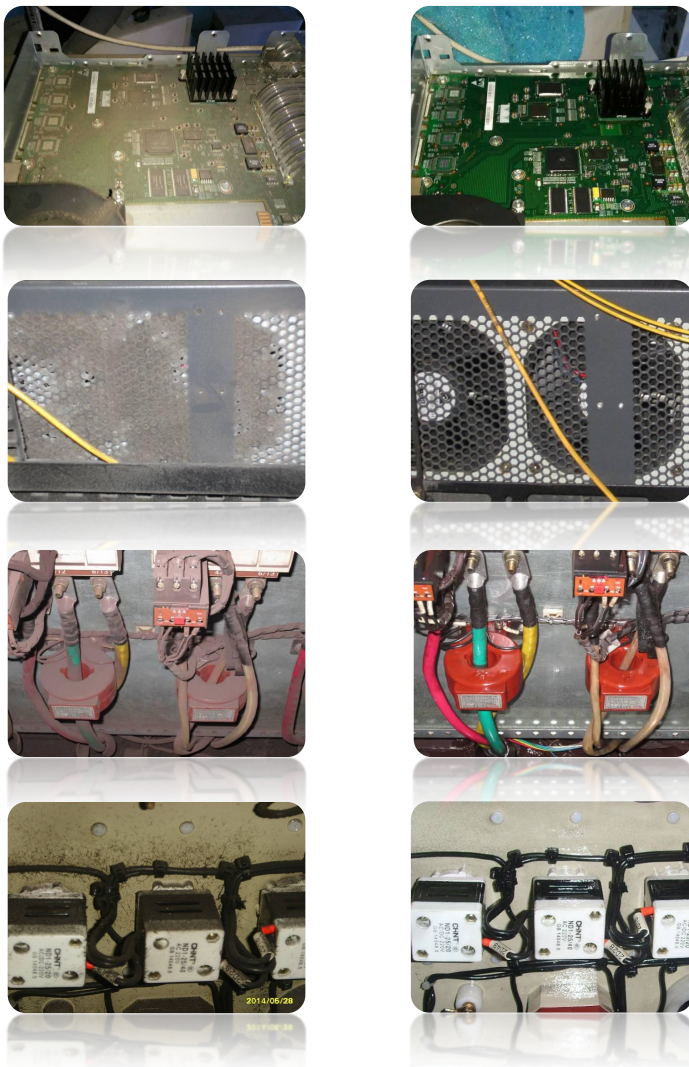
### Insulation protection

Protect equipment against leakage  
Eliminate leakage basically



# Reduce Economic Losses

## Before & After:



01

Avoiding loss caused by blackout

02

Clean, Decontamination, Energy Saving and Consumption Reduction

03

Insure equipment operation safety

04

Improve equipment operating efficiency

05

Extend equipment service life

Incidence of fire and explosion caused by high **temperature** and aging decreased by 30%.

The average **service life** of the equipment is prolonged by more than 20%.

Equipment fault rate caused by static electricity or **dust** reduce more than 70%.

The average reduction of **energy consumption** is about 20%.



## ⑥ Company Introduction



Fujian Tengdajie Environmental Protection Engineering Co., Ltd. is committed to the application of liquid nano material technology. It is a high-tech modern company integrating R&D, production, sales and service. Each series of products has a number of patents and has obtained ISO and OHSAS certificates. Among them, the maintenance test report and the non-toxic and harmless test report on human body have been underwritten by China Pacific Insurance Company. They have the characteristics of non-toxic, non corrosive, high stability, high reliability and other high competitiveness, leading the new trend of industry development.

Tengdajie has successfully provided all-round high-quality cleaning services for various fields, including power system, power generation system, manufacturing, communication operators, education system, etc. It undertakes the mechanical cleaning work and related services for the upstream and downstream companies of large enterprises, such as State Grid Corporation of China, Sinopec, China Tobacco, China Unicom, and Shanghai Metro, Innovative research and development of a series of competitive high-quality cleaning products, supporting systems and perfect service system; Starting from the development of personalized maintenance scheme, Tengdajie combines professional construction teams, professional maintenance products, professional tools and appliances and closed-loop professional maintenance system to create the best safe and efficient market choice, strictly trains professional construction teams with certificates, uses scientific process maintenance system, professional detergent and protective agent collocation, and independently develops safe and reliable professional tools and appliances, In order to provide high-quality material conditions for maintenance, the professional team provides targeted maintenance plans for customers, and the on-site survey, evaluation and return visit and other means cross operate to bring customers the most perfect service system.

## 6 Company culture



Innovate  
Cooperate

Serve  
Win-win

### **Enterprise tenet:**

We always seek to provide power and communication services through high-tech products and professional technologies  
Enterprises provide professional cleaning and maintenance services for China's power and communications  
Safe operation escort

### **Social image:**

Tengdajie is an enterprise with a number of core technologies and professional construction teams.

### **Corporate vision:**

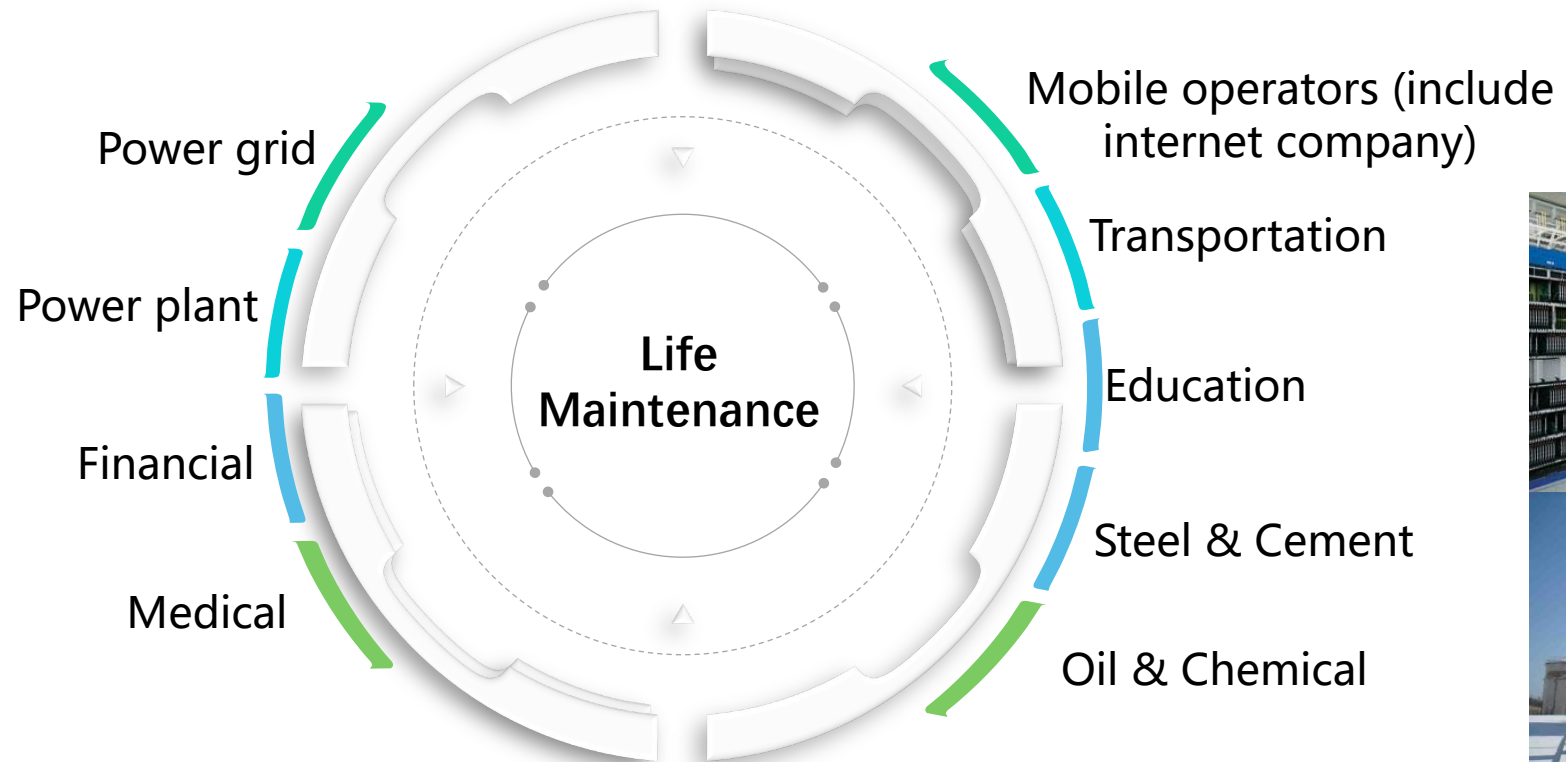
Become a pioneer in the industry standard of live cleaning and maintenance and an excellent demonstration enterprise in the industry

Industrial group, a stage for enterprises to achieve higher career.

### **Core values:**

Integrity is the root of an enterprise, safety is the guarantee of an enterprise, and innovation is the life of an enterprise  
The team is the soul of the enterprise.





**TDJ is a comprehensive group of companies engaged in the research, development, production, sales, service and investment of new materials technology applications, providing customers with a complete set of service solutions and products for diversified new material technology applications. Products are mainly used for inspection, cleaning and maintenance of network communication, electric equipment and other equipment.**



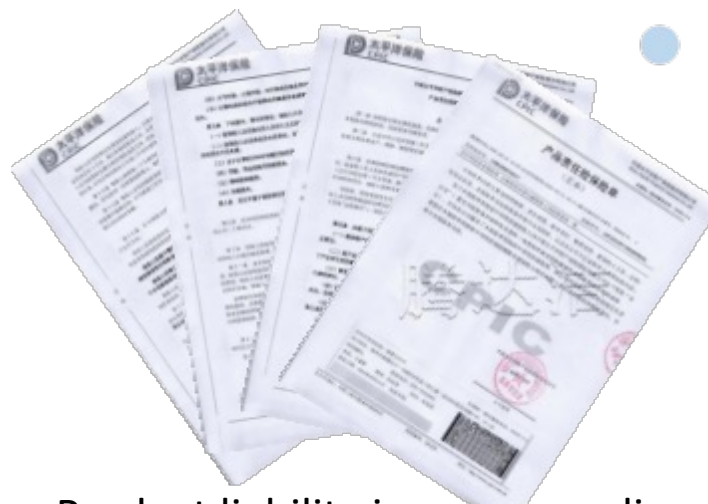
- OHSAS18001 Occupational Health and Safety System Certification
- ISO14001 Environmental Management System Certification
- ISO9001 Quality Management System Certification

6

# Qualifications



Product test report



Product liability insurance policy



Inspection report of cargo transportation conditions  
(Road, sea, air, railway)



Test Report of Live Maintenance  
Tools and Instruments



Product MSDS

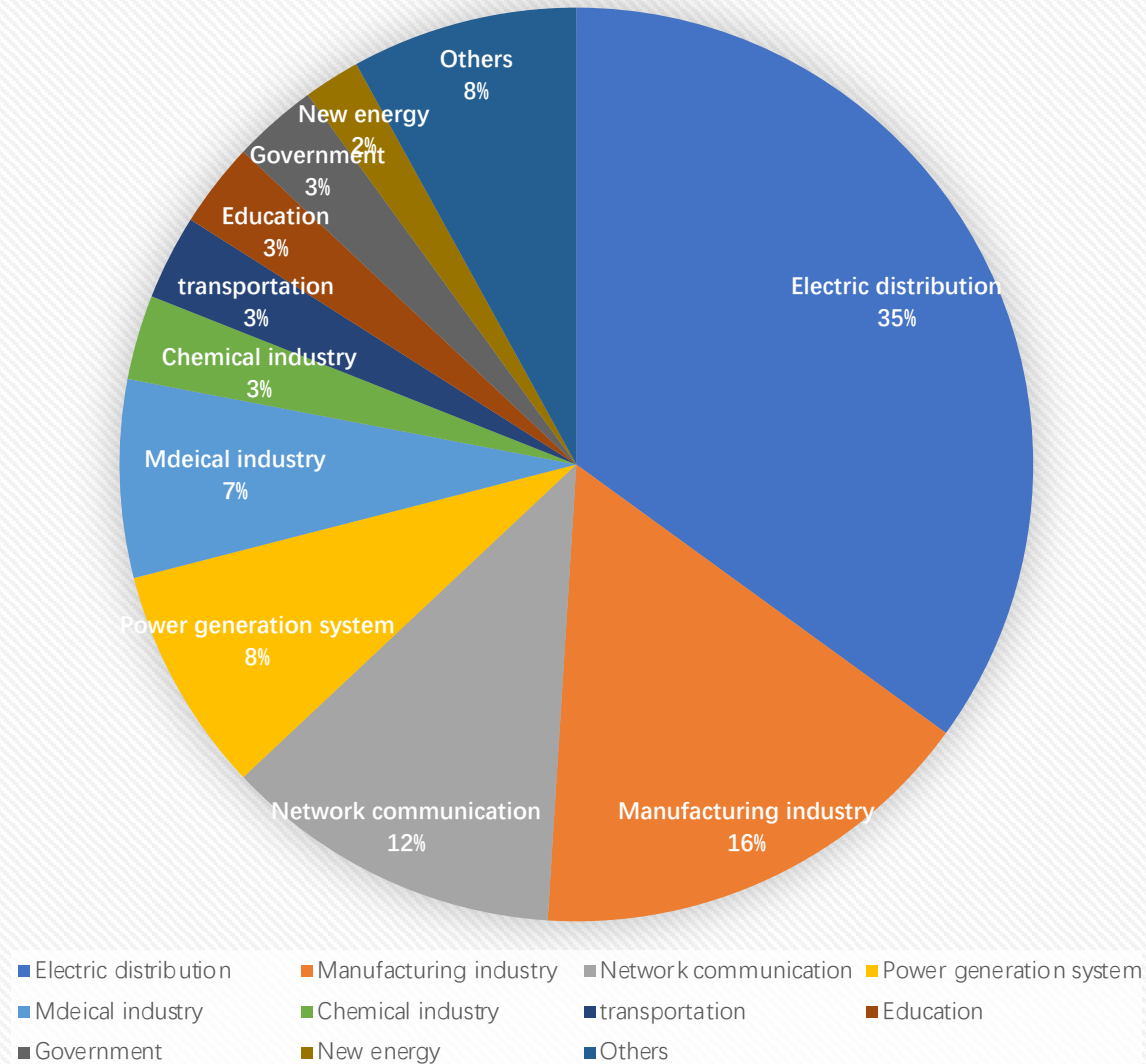


## ⑥ Business distribution map



Our technical service teams are all over the country, providing professional and personalized maintenance services for hundreds of customers. In order to solve the customer's pain points, an efficient and safe construction and maintenance plan is formulated. Live cleaning and maintenance technology is widely used in communication, power, petroleum, petrochemical, aviation, aerospace, navigation, transportation, national defense, medical, automation systems, satellite navigation and other fields. We have oversea partners in South Africa, Canada, Azerbaijan, UAE, Qatar, Iraq, Malaysia, Philippines, Nigeria, India etc.

## ④ Business distribution chart



International Business Contact: :

Jie Li

Email: [jie.li@tengdajie.com](mailto:jie.li@tengdajie.com)

Mobile: +86 13816317711

Whatsapp: 0086 13816317711

Wechat: 15056982981



# Thank You!

Fujian Tengdajie Environmental Protection Engineering Co., Ltd.