



ندوة خبراء
السلامة الكهربائية
Electrical Safety Experts Symposium

Maintenance and verification of electrical installations for buildings and dwellings in Japan

By: Mr. Akira Sano, Mr. Yoichi Sugihara and Mr. Takashi Honda
From: Electrical Safety Inspection Association, FESIA, JAPAN

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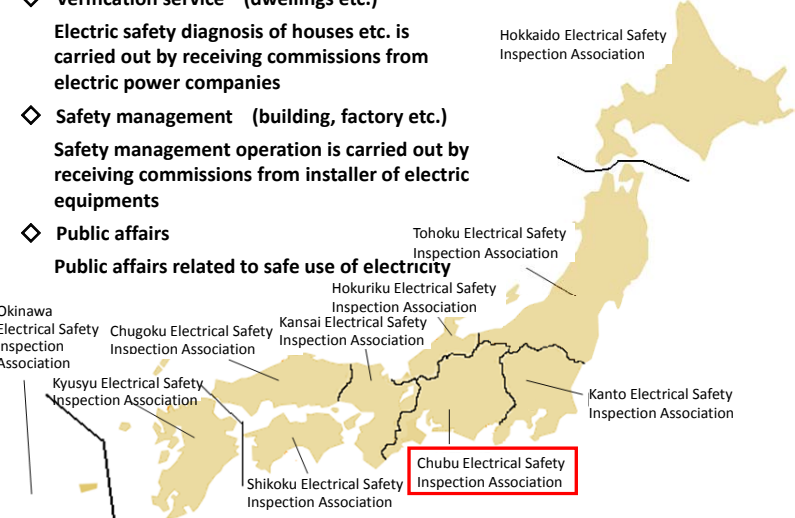
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Electrical Safety Inspection Associations in whole Japan




Business Content

- ◇ **Verification service (dwellings etc.)**
Electric safety diagnosis of houses etc. is carried out by receiving commissions from electric power companies
- ◇ **Safety management (building, factory etc.)**
Safety management operation is carried out by receiving commissions from installer of electric equipments
- ◇ **Public affairs**
Public affairs related to safe use of electricity

Labels on the map:

- Hokkaido Electrical Safety Inspection Association
- Tohoku Electrical Safety Inspection Association
- Hokuriku Electrical Safety Inspection Association
- Kansai Electrical Safety Inspection Association
- Chugoku Electrical Safety Inspection Association
- Kyusyu Electrical Safety Inspection Association
- Shikoku Electrical Safety Inspection Association
- Chubu Electrical Safety Inspection Association (highlighted with a red box)
- Kanto Electrical Safety Inspection Association
- Okinawa Electrical Safety Inspection Association



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Content of Presentation

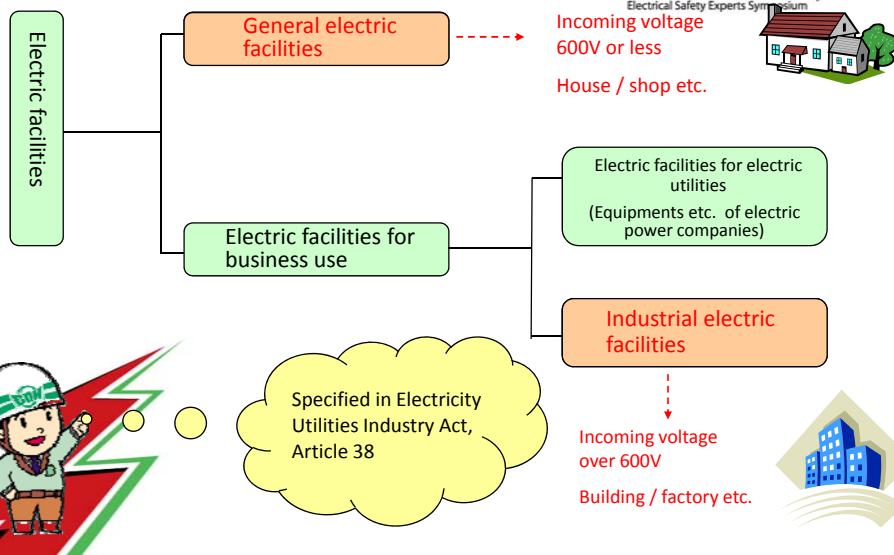



- 1 Configuration of electric facilities
- 2 Security system of electric facilities
- 3 Maintenance, management, and inspection of electric equipments
- 4 Generation status of electrical accident

I will explain the items above



1 Configuration of Electric Facilities







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I understood that the small electric facilities for dwellings are "general electric facilities" and the medium or large scale electric facilities for buildings are "industrial electric facilities".

How is the security system for these facilities?

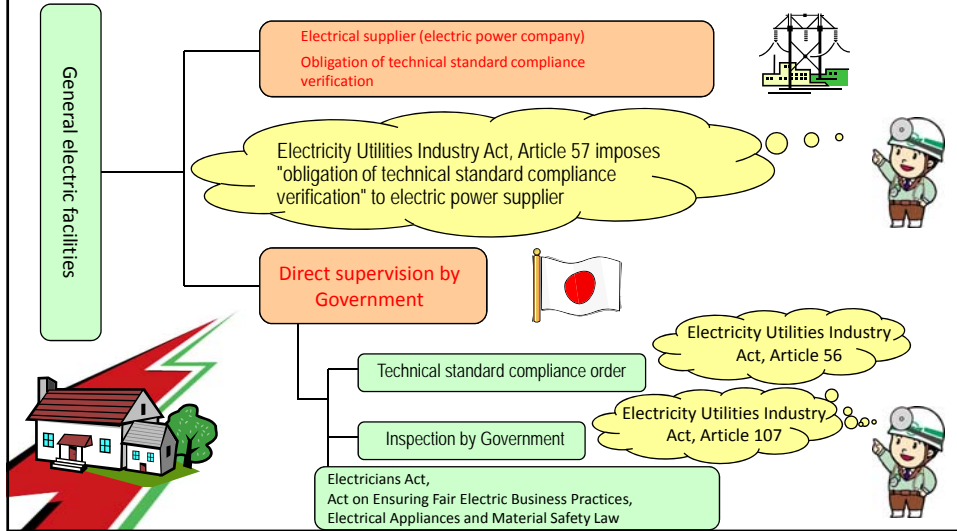


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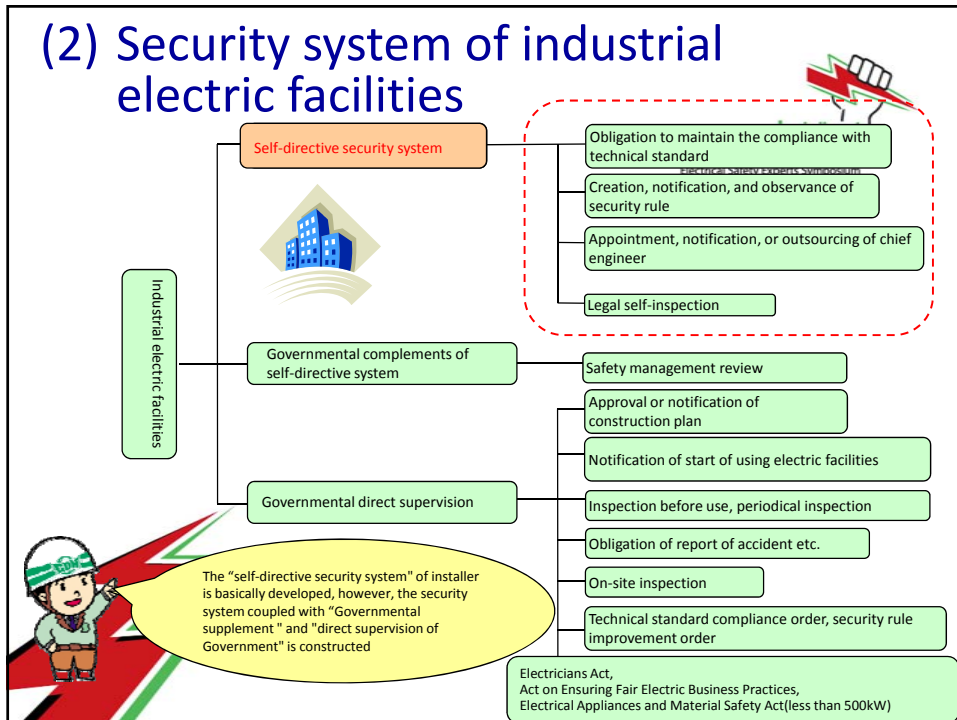
2 Security System of Electric facilities



(1) Security system of general electric facilities



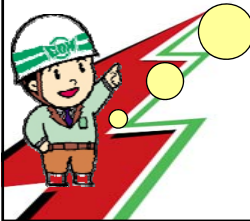
(2) Security system of industrial electric facilities



Duty of person who installs the industrial electric facilities



Various obligations are placed on the person who installs the industrial electric facilities by law.



Duty of person who installs the industrial electric facilities



Obligation to maintain the compliance with technical standard

- Maintain the industrial electric facility so that it complies with the technical standard decided by Ministry of Economy, Trade and Industry

Creation, notification, and observance of security rule

- Decide the security tool for ensuring the security of industrial electric facility and take action to ensure the security

Appointment, notification, or outsourcing of chief engineer

- Appoint the chief electric engineer to get him/her carry out the supervision of security and observe the instructions and advices for the security given by the chief electric engineer

Notification and report decided by law

- Notification of construction plan, report of electrical accident, notification related to pollution prevention etc

3 Maintenance and Management of Electric Equipment



(1) Maintenance, management, and inspection of general electric facilities

The obligation of maintenance and management of general electric facilities is given to the electrical supplier (electric power company) because the owner's knowledge on electricity is not always sufficient.

The electrical supplier is obligated to carry out the following verification.



(1) Maintenance, management, and inspection of general electric facilities



Initial verification

- Carried out when the general electric facility is installed, added, or changed

(Electricity Utilities Industry Act implementation restrictions, Article 96)

Periodical verification

- Carried out every four years
- Carried out annually
(bathhouse, school, welfare facility for the aged etc.)

(Electricity Utilities Industry Act implementation restrictions, Article 96)

Content of maintenance, management, and inspection ①

Initial verification

- Confirmation of insulation status
It is checked with the megohmmeter. However, if the measurement with the megohmmeter is not available, the leak current is measured.



- Confirmation of grounding status
It is checked with the grounding resistance meter.

- Checking of equipments
External appearance is checked with eyes for following items.

- lead-in port wiring
- load equipment
- distribution board
- grounding
- wiring / devices



- Inquiry and PR of electric safety

Content of maintenance, management, and inspection ②

Periodical verification

○ Confirmation of insulation status

It is checked with the megohmmeter. However, if the measurement with the megohmmeter is not available, the leak current is measured.

○ Checking of equipments

External appearance is checked with eyes for following items.

- lead-in port wiring
- load equipment
- distribution board
- grounding
- wiring / devices



○ Inquiry and PR of electric safety



Checking of insulation status

Measurement of insulation resistance



Measurement of leak current

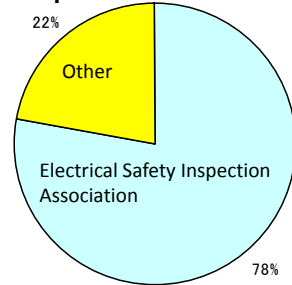


Verification service trustee status (FY2009)



Number of customers in whole of country	87,580,000
Number of customers entrusted with Electrical Safety Inspection Associations	68,140,000
Trustee rate	77.8%

Trustee rate of Electrical Safety Inspection Association



Verification service implementation (FY2009)



Initial Verification

Number of implemented verification	948,000
Number of notified defects	19,800
Defect notification rate	2.1%

Periodical Verification

Number of implemented verification	17,450,000
Number of unavailable verification (rejection of verification)	104,000 (519 cases)
Rate of unavailable verification (rejection of verification)	0.59 % (0.003 %)
Number of notified defects	367,000
Defect notification rate	2.1 %

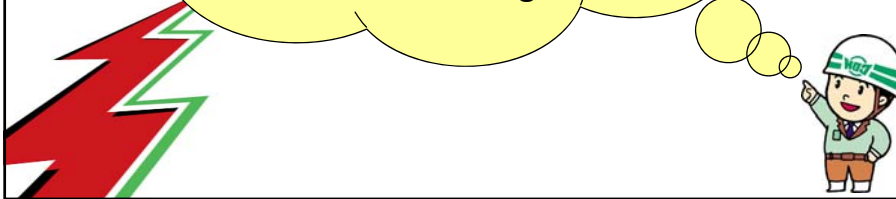


The implementation status is the actual achievement of Electrical Safety Inspection Associations in FY2009.

Problem of verification service



For the verification service ,
the checking is carried out in
doors of conventional houses,
however, entering into the
houses with the approval of
customers is becoming difficult.

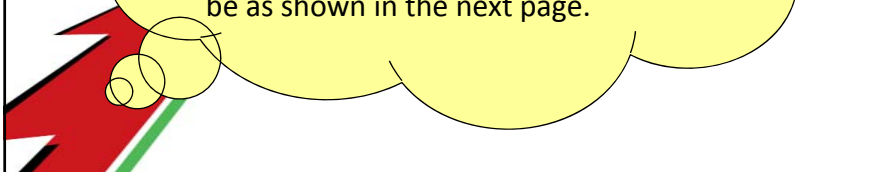


(2) Maintenance, management, and inspection of industrial electric facilities



The maintenance and the management of
industrial electric facilities are carried out
based on the content defined in the security
rule.

It is important to create the security rule
based on the content that is best suitable for
the electric facilities and the content should
be as shown in the next page.



(2) Maintenance, management, and inspection of industrial electric facilities



Content that should be stipulated by self-directive rule

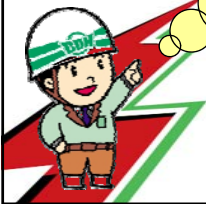
- ① Items related to assignment and organization of person who manages the operation
- ② Items related to security education of person who is involved in
- ③ Items related to inspection tour, checking, and inspection for security
- ④ Items related to running and operation of industrial electric facilities
- ⑤ Items related to the maintenance method when the operation of electric generation plant is stopped for a long period
- ⑥ Items related to measures that should be taken in case of disaster or other emergency status
- ⑦ Items related to record of security
- ⑧ Items related to implementation system related to legal self inspection and storage of record

Other items required for security of electricity

Type and outline of checking and inspection ①



For the checking of industrial electric facilities, the conformity to technical standard and relevant civil standard is checked based on the security rule. The types of checking and inspection are shown in the following page.



Type and outline of checking and inspection ①

Type of checking and inspection

- ① Checking during construction period
- ② Completion inspection
- ③ Daily inspection tour
- ④ Periodical checking (monthly checking, annual checking)
- ⑤ Precision checking
- ⑥ Interim checking



Type and outline of checking and inspection ②

Checking during construction period

- Checking during construction period is the checking of external appearance that is carried out during the construction period of new installation and modification of electric facilities.

Completion inspection

- when the construction is completed ,checking, measurement, and test are carried out for checking whether the construction of electric facilities has been carried out according to the plan and the compliance with technical standard etc.



Type and outline of checking and inspection ③



Daily inspection tour

- Checking whether there is defect with eyes for the electric facility that is being operated during the daily inspection tour in the plant by installer and its engaged person.

Periodical checking

[Monthly checking]

- Checking, measurement, and test that are carried out once a month while the system is operated. Visual, acoustic, and osmic checking of external appearance, various measurements with measuring instruments etc., and status check etc. are carried out.

[Annual checking]

- Checking, measurement, and test that carry out the operation test of protection relay and breaker etc. by turning OFF the power supply once a year in addition to the checking items of monthly checking.

Type and outline of checking and inspection ④



Precision checking

- Checking, measurement, and test that are carried out by disassembling the electric equipment if necessary in a long-time cycle (3 to 5 years).

Interim checking

- Checking, measurement, and test are carried out in the event of failure or symptom of failure of electric facilities.



Content of checking and inspection ①



Checking during construction period

- Visual checking of external appearance is carried out for the following items
 - lead-in equipment
 - power receiving equipment
 - electric power distribution equipment
 - load equipment
 - electric generator

Completion inspection

- Checking of external appearance
- Measurement of grounding resistance
- Measurement of insulation resistance
- Dielectric strength test
- Protection relay test

Content of checking and inspection ②



Periodical checking

[Monthly checking]

- Checking of external appearance
- Measurement of voltage and current
- Measurement of leak current

[Annual checking]

- Monthly checking items
- Measurement of grounding resistance
- Measurement of insulation resistance
- Protection relay test

Precision checking / interim checking

[Precision checking]

- Checking in equipment
- Insulation oil test

[Interim checking]

- Carried out according to the content of periodical checking or precision checking depending on the type of failure

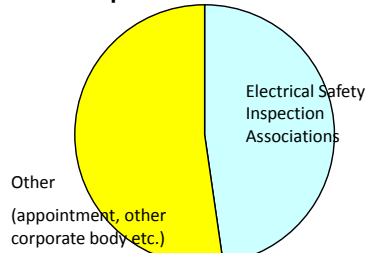


Safety management trustee status (FY2009)



Number of customers in whole of country (industrial electric facilities)	798,000 cases
Number of customers entrusted with Electrical Safety Inspection Association	381,000 cases
Trustee rate	47.8%

Trustee rate of Electrical Safety Inspection Association



Safety management implementation status (FY2009)



Number of periodical checking (including precision checking)	2,789,000 cases
Number of interim checking	12,000 cases
Number of checking during construction period	35,000 cases
Number of completed inspections	37,000 cases

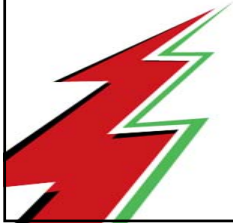
Number of defects that are pointed out	753,000 cases
Number of renovations	280,000 cases
Renovation rate	37.2%

The implementation status is the actual achievement of Electrical Safety Inspection Associations in FY2009.

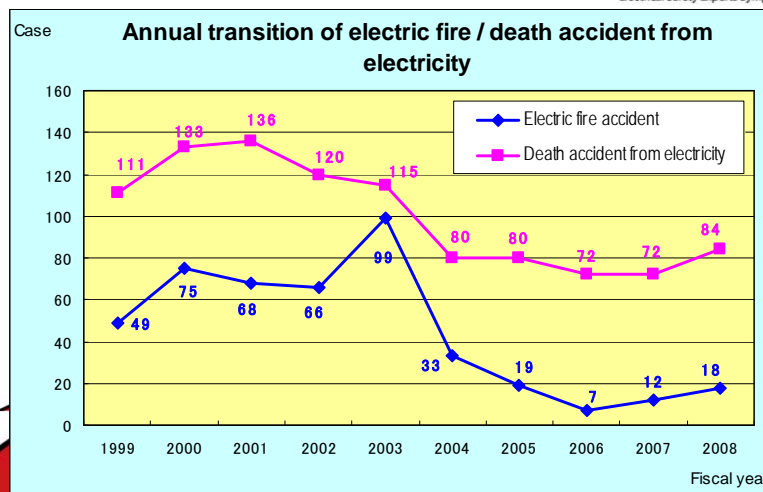




4 Status of Electrical Accident



Status of electrical accident (whole in Japan)



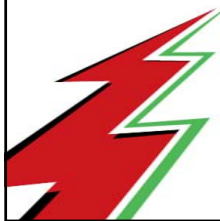
2008FY Quoted from statics of electric safety, electric safety section, Nuclear and Industrial Safety Agency, Ministry of Economy, Trade and Industry

Conclusion



For the maintenance and management of electric facilities, "self-directive security system" should be basically set up by the installer.

However, we think that the sound maintenance and management can be realized by public and private cooperative system including development of laws and direct involvement of Government.





THANK YOU

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