CE Marking Compliance
Elite Electronic Engineering

Military/Commercial Aviation

FCC/CE Mark/International

Automotive/Truck/Ag/Construction

Environmental Stress
Elite Electronic Engineering

- Military Commercial Aviation
  - RS testing 200V/m to 40GHz
  - HIRF CAT F (ALSE) CAT G (mode tuned)
  - Lightning DO-160E WF1-5 Level 5

- FCC/CE Mark
  - 3m chamber
  - TCB/CAB Certification Services

- Environmental
  - Full environmental stress test laboratory
  - Large Vibration Tables
  - HALT HASS
CE Marking Compliance

- Requirements Overview for EMC & Safety
- European Conformity Assessment Process
- EMC Requirements
- Safety Requirements
- Documentation Requirements
- Gray Areas
- Typical Costs & Timing
- Informational Sites
- Questions
Global Compliance Requirements

- **US & Canada**
  - RF Interference Digital Devices
    - FCC 47CFR Part 15B
    - Industry Canada- ICES-003
  - Safety
    - OSHA, Local Authorities
    - Industry Canada, Provincial Authorities

- **Europe**
  - **European Commission**-
    - Defines EHSR in Directives
      - EMC Directive, Low Voltage Directive
      - Machine Safety Directive
      - R&TTE Directive
      - RoHS, WEEE
    - Defines Standards in Official Journal
      - CEN, CENELC,
      - IEC, CISPR, ISO, ETSI

- **Asia, Latin America**
ANNEX I
Principal Elements of the Safety Objectives for Electrical Equipment Designed For Use within Certain Voltage Limits

2) Protection against hazards arising from the electrical equipment

Measures of a technical nature should be prescribed in accordance with point 1, in order to ensure:

(a) that persons and domestic animals are adequately protected against the danger of physical injury or other harm which might be caused by direct or indirect contact;

(b) that temperatures, arcs or radiation which would cause a danger, are not produced;

(c) that persons, domestic animals and property are adequately protected against non-electrical dangers caused by the electrical equipment which are revealed by experience;

(d) that the insulation must be suitable for foreseeable conditions.
European Union Compliance

- EU- 27 Countries
- EFTA- 4 Countries
  - Iceland, Norway, Licht, Switz
- PECA- Protocols to the Europe Agreements on Conformity Assessment (PECAs)
  - Hungary, Czech Republic, Lithuania, Latvia, Slovenia, the Slovak Republic and Estonia. Bulgaria and Romania to follow.
European Union Compliance

- The need for CE Marking
- New Approach Directives
  - Eliminate differences in laws therefore remove non-tariff barriers to trade
  - Prescribe the Essential Health, Safety, and Performance Requirements
  - Member states transpose directives and harmonized standards into their national requirements
  - Absence of third party intervention
  - Manufacturer Self Declaration
  - Voluntary Use of Standards
  - CE Label as the indication of compliance
  - Some national exceptions..
CE Mark Conformity Assessment Process - Due Diligence

Identify Conformity Assessment Plan:
- Directives
- Standards
- Documentation

Select appropriate directive
Select appropriate standard
Identify configuration of apparatus

Test (or analysis)
- Develop Test Plan (for EMC)
- Test to harmonized standard, non-harmonized standard, perform review & analysis.

Prepare DOC
- Compile Technical Construction File
- Manufacturer prepares & signs DOC

Apply CE Mark
- Manufacturer affixes the CE label
<table>
<thead>
<tr>
<th>Directive</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>90/396/EEC</td>
<td>Appliances burning gaseous fuels</td>
</tr>
<tr>
<td>2000/9/EC</td>
<td>Cableway installations designed to carry persons</td>
</tr>
<tr>
<td>89/106/EEC</td>
<td>Construction products</td>
</tr>
<tr>
<td>2004/108/EC</td>
<td>Electromagnetic compatibility</td>
</tr>
<tr>
<td>94/9/EC</td>
<td>Equipment and protective systems in potentially explosive atmospheres</td>
</tr>
<tr>
<td>93/15/EEC</td>
<td>Explosives for civil uses</td>
</tr>
<tr>
<td>95/16/EC</td>
<td>Lifts</td>
</tr>
<tr>
<td>2006/95/EC</td>
<td>Low voltage equipment</td>
</tr>
<tr>
<td>98/37/EC</td>
<td>Machinery safety</td>
</tr>
<tr>
<td>2004/22/EEC</td>
<td>Measuring instruments</td>
</tr>
<tr>
<td>90/385/EEC</td>
<td>Medical devices: Active implantable</td>
</tr>
<tr>
<td>93/42/EEC</td>
<td>Medical devices: General</td>
</tr>
<tr>
<td>98/79/EC</td>
<td>Medical devices: In vitro diagnostic</td>
</tr>
<tr>
<td>92/42/EEC</td>
<td>New hot-water boilers fired with liquid or gaseous fluids (efficiency requirements)</td>
</tr>
<tr>
<td>90/384/EEC</td>
<td>Non-automatic weighing instruments</td>
</tr>
<tr>
<td>94/62/EC</td>
<td>Packaging and packaging waste</td>
</tr>
<tr>
<td>89/686/EEC</td>
<td>Personal protective equipment</td>
</tr>
<tr>
<td>97/23/EC</td>
<td>Pressure equipment</td>
</tr>
<tr>
<td>1999/5/EC</td>
<td>Radio and telecommunications terminal equipment</td>
</tr>
<tr>
<td>94/25/EC</td>
<td>Recreational craft</td>
</tr>
<tr>
<td>87/404/EEC</td>
<td>Simple pressure vessels</td>
</tr>
<tr>
<td>88/378/EEC</td>
<td>Toys safety</td>
</tr>
</tbody>
</table>
Which Directives Apply?

- Specific Directives
- General Directives
- Explicit exclusions in EMC Directive
  - Radio Transmitters covered by 1999/5/EC
  - Amateur radio equipment (non-commercially available)
- Exclusions for equipment covered by other specific directives
  - Medical Devices
  - R&TTE
  - Motor Vehicles **
  - Agricultural and Forestry Tractors**
- **“e-mark” type approvals
Applicable Directives

- EMC Directive- 2004/108/EC
  - Digital devices, motors

- Low Voltage Directive- 2006/95/EC
  - 50VAC < > 1000VAC
  - 75VDC < > 1500VDC

  - Primarily mechanical systems
  - Moving, entanglement, sharps hazards

- Each Directive (above) has a Guide
Applicability of EMC Directive

- Excluded from the EMC Directive
- Contains electrical/electronic parts
  - No
  - Yes
- Product families excluded
  - Yes
  - No
- Covered by other Directives
  - Yes
  - No
- Inherently benign equipment
  - Yes
  - No
Applicability of EMC Directive

Excluded from the EMC Directive

- Components or Sub-assemblies
  - Intended for incorporation into an apparatus
    - Yes
      - Apparatus
    - No
      - By the end user
        - Yes
          - Apparatus
        - No
          - By the end user

- Finished Appliance
  - Yes
    - Apparatus

- Combination of finished appliances made commercially available as a single functional unit
  - Yes
    - Installation

By the end user

Apparatus

Yes

C

D
Applicability of EMC Directive

Fixed Installation

Provisions for apparatus intended for incorporation into a given fixed installation and otherwise not commercially available:

Documentation includes
- Identification of fixed installation & EMC characteristics
- Precautions for incorporation into the installation
- Information referred to in Art 9(1) & 9(2)

CE Marking 2004/108/EC

Manufacturers Choice

Otherwise commercially available

Intended for incorporation into given fixed installation

No Yes

B

No

Yes

No

Yes

Fixed Installation
Applicability of EMC Directive

Mobile Installation

Intended to be used permanently at a predefined location

Yes

Fixed Installation
Provisions for fixed installations mandatory:
Essential requirements

No

D
Applicability of LVD

Low Voltage Directive - 2006/95/EC

- Consumer and capital goods designed to operate within the limits of
  - 50VAC < > 1000VAC
  - 75VDC < > 1500VDC

- Exclusions
  - Electrical equipment in explosive atmospheres,
  - for radiology and medical purposes, goods and passenger lifts, electricity meters
  - Plugs and socket outlets for domestic use, electric fence controllers
  - Specialized electrical equipment, on ships, aircraft or railways
  - Some basic components for which a risk assessment cannot be undertaken since the risk depends on how they're incorporated and used.
Obvious vs. Gray Areas

- Obvious vs. Gray Areas
  - Which Directives & Standards apply
  - How thorough should the conformity assessment be?
  - Interpretation of harmonized standards
The following devices are subject only to the general conditions of operation in Secs. 15.5 and 15.29 and are exempt from the specific technical standards and other requirements contained in this part. The operator of the exempted device shall be required to stop operating the device upon a finding by the Commission or its representative that the device is causing harmful interference. Operation shall not resume until the condition causing the harmful interference has been corrected. Although not mandatory, it is strongly recommended that the manufacturer of an exempted device endeavor to have the device meet the specific technical standards in this part.

(a) A digital device utilized exclusively in any transportation vehicle including motor vehicles and aircraft.

(b) A digital device used exclusively as an electronic control or power system utilized by a public utility or in an industrial plant. The term public utility includes equipment only to the extent that it is in a dedicated building or large room owned or leased by the utility and does not extend to equipment installed in a subscriber's facility.

(c) A digital device used exclusively as industrial, commercial, or medical test equipment.

Others…
“1.2.2 Sections 3 to 7 do not apply to digital apparatus used:”

1. in a transportation vehicle;

2. as an electronic control, either by a public utility or in an industrial plant;

3. in a power system, either by a public utility or in an industrial plant;

4. as test equipment, including an oscilloscope and a frequency counter, in an industrial, commercial or medical environment;

Others…
United States-
- Permanently installed equipment require permits.
  - Authority having jurisdiction “AHJ”; Governed by the National Electrical Code
  - Article 90.7 of the NEC identifies criteria for acceptability of electrical equipment; NRTL listed equipment
- OSHA 29 CFR 1910
  - Subpart S requires all equipment installed in the workplace to be suitable for installation and use in conformity with the provisions of Subpart S.
  - 1910.303b(1)(i) and 1910.399 identify listed and labeled equipment as being suitable if used as intended and within ratings.

Canada-
- Provincial Regulations and Statutes
- Federal coordination to ensure Global Mutual Recognition
  - [http://www.canlii.org/sk/laws/regu/e-6.3r.1/20080415/whole.html](http://www.canlii.org/sk/laws/regu/e-6.3r.1/20080415/whole.html)
Which Standards Apply

- Official Journal
  - EMC, LVD, MSD
  - “Europa” web site for latest rev.

- Order of Use
  - Product Specific Standard
  - Generic Standard
  - Basic Standard

- Look for Date of Cessation of Presumption of Conformity.

---

**European standards references**

<table>
<thead>
<tr>
<th>Cenex</th>
<th>EN 50665-1:2001</th>
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**Amendment AI 2001**

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**Amendment AI 2003**

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<td>EN 50665-2-2:2003</td>
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<td>Note</td>
<td>A.2.3</td>
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**Amendment AI 2003**

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<tr>
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<td>EN 50665-2-3:2003</td>
</tr>
<tr>
<td>Note</td>
<td>A.2.3</td>
</tr>
<tr>
<td>Date</td>
<td>3.1.2003</td>
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</table>

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### Example - Which Standards Apply

<table>
<thead>
<tr>
<th>European standardization organization (1)</th>
<th>Reference and title of the standard (and reference document)</th>
<th>Reference of the superseded standard</th>
<th>Date of cessation of presumption of conformity of the superseded standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cenelec</td>
<td>EN 61326: 1997</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electrical equipment for measurement, control and laboratory use — EMC requirements (IEC 61326:1997)</td>
<td>Relevant generic standard(s) Note 2.3</td>
<td>Date expired (1.7.2001)</td>
</tr>
<tr>
<td>Cenelec</td>
<td>EN 61326-1:2006</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electrical equipment for measurement, control and laboratory use — EMC requirements — Part 1: General requirements (IEC 61326-1:2005)</td>
<td>EN 61326:1997 &amp; amendments Note 2.3</td>
<td>1.2.2009</td>
</tr>
</tbody>
</table>
Which Standards Apply

- Standards Identification
  - EN Euronorm
  - BS EN
  - IEC
1 Scope

This part of IEC 61326 specifies requirements for immunity and emissions regarding electromagnetic compatibility (EMC) for electrical equipment, operating from a supply or battery of less than 1 000 V a.c. or 1 500 V d.c. or from the circuit being measured, intended for professional, industrial-process, industrial-manufacturing and educational use, including equipment and computing devices for
– measurement and test;
– control;
– laboratory use;
– accessories intended for use with the above (such as sample handling equipment), intended to be used in industrial and non-industrial locations.
EN 61326-1

- **Immunity Testing**
  - Electrostatic Discharge
  - RF Radiated Immunity
  - Magnetic Field Immunity
  - Voltage Dips & Interruptions on Supply Line
  - Electrical Fast Transients/Burst Surge Immunity
  - Conducted RF Immunity

- **Emissions Testing**
  - RF Radiated Emissions
  - RF Conducted Emissions
5.1 General
“An EMC test plan shall be established prior to testing. It shall contain, as a minimum, the elements given in 5.2 to 5.5.”

Test Plan
5.2.2 Composition of EUT
5.2.3 Assembly of EUT
5.2.4 I/O ports
5.2.5 Auxiliary equipment
5.2.6 Cabling and earthing (grounding)
5.3.1 Operation modes
5.3.2 Environmental conditions
5.3.3 EUT software during test
5.4 Specification of performance criteria
5.5 Test description
Performance criterion A: During testing, normal performance within the specification limits.

Performance criterion B: During testing, temporary degradation, or loss of function or performance which is self-recovering.

Performance criterion C: During testing, temporary degradation, or loss of function or performance which requires operator intervention or system reset occurs.
Conducted Emissions

Conducted Emissions

- AC Mains
- CISPR 11/EN55022
- Class A vs. Class B Limits

<table>
<thead>
<tr>
<th>Frequency Range MHz</th>
<th>Limits Quasi-Peak dB(μV)</th>
<th>Limits Average dB(μV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.15 to 0.5</td>
<td>79</td>
<td>66</td>
</tr>
<tr>
<td>0.5 to 30</td>
<td>73</td>
<td>60</td>
</tr>
</tbody>
</table>

Class A Limits

Note: Per 61326-2006 Sec 7.2, class B equipment will require Harmonics & Flicker Emissions measurements.
Radiated Emissions

- CISPR 11/EN55022
- Class A vs. Class B Limits

<table>
<thead>
<tr>
<th>Frequency MHz</th>
<th>Measuring Distance (meters)</th>
<th>Quasi-peak limits (dBμV/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 to 230</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>230 to 1000</td>
<td>10</td>
<td>47</td>
</tr>
</tbody>
</table>

Class A Limits
Radiated Immunity

- IEC 61000-4-3
- Test at 3 meters
- Four sides of test item

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Modulation</th>
<th>Level (V/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 to 1000</td>
<td>1 kHz AM @ 80%</td>
<td>3</td>
</tr>
<tr>
<td>1400 to 2000</td>
<td>1 kHz AM @ 80%</td>
<td>3</td>
</tr>
<tr>
<td>2000 to 2700</td>
<td>1 kHz AM @ 80%</td>
<td>1</td>
</tr>
</tbody>
</table>
Conducted Immunity

**AC Mains Tests**

**Electrical Fast Transients**
- IEC 61000-4-4
- 1 kV (5/50 ns, 5 kHz)

**Surge**
- IEC 61000-4-5
- 0.5 kV L-L 1.0 kV L-E

**Voltage Dips**
- IEC 61000-4-11
- 0 % during half cycle
- 0 % during 1 cycle
- 70 % during 25/30e) cycles

**Short Interruptions**
- IEC 61000-4-11
- 0 % during 250/300 cycles
Conducted Immunity

AC Mains

Conducted RF Immunity
IEC 61000-4-6
3Vpp 150 kHz to 80 MHz

Applied to AC Mains through Coupling Decoupling Network (CDN)

Applied BCI to interconnect cables
ESD

- Electrostatic Discharge
  - 4 kV contact discharge
  - 4kV air discharge
<table>
<thead>
<tr>
<th>Port</th>
<th>Phenomenon</th>
<th>Basic standard</th>
<th>Test value</th>
<th>Performance criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Enclosure</strong></td>
<td>Electrostatic discharge (ESD)</td>
<td>IEC 61000-4-2</td>
<td>4 kV/4 kV contact/air</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>EM field</td>
<td>IEC 61000-4-3</td>
<td>3 V/m (80 MHz to 1 GHz)  3 V/m (1.4 GHz to 2 GHz)</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 V/m (2.0 GHz to 2.7 GHz)</td>
<td></td>
</tr>
<tr>
<td><strong>AC power (including protective earth)</strong></td>
<td>Voltage dip</td>
<td>IEC 61000-4-11</td>
<td>0 % during half cycle  0 % during 1 cycle</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>70 % during 250/300 cycles</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>Short interruptions</td>
<td>IEC 61000-4-11</td>
<td>0 % during 250/300 cycles</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>Burst</td>
<td>IEC 61000-4-4</td>
<td>1 kV (5/50 ns, 5 kHz)</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Surge</td>
<td>IEC 61000-4-5</td>
<td>0.5 kV(a)/1 kV(b)</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Conducted RF</td>
<td>IEC 61000-4-6</td>
<td>3 V (150 kHz to 80 MHz)</td>
<td>A</td>
</tr>
<tr>
<td><strong>DC power (including protective earth)</strong></td>
<td>Burst</td>
<td>IEC 61000-4-4</td>
<td>1 kV(5/50 ns, 5 kHz)</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Surge</td>
<td>IEC 61000-4-5</td>
<td>0.5 kV(a)/1 kV(b)</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Conducted RF</td>
<td>IEC 61000-4-6</td>
<td>3 V (150 kHz to 80 MHz)</td>
<td>A</td>
</tr>
<tr>
<td><strong>I/O signal/control (including lines connected to functional earth port)</strong></td>
<td>Burst</td>
<td>IEC 61000-4-4</td>
<td>0.5 kV(d)(5/50 ns, 5 kHz)</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Surge</td>
<td>IEC 61000-4-5</td>
<td>1 kV(d), c)</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Conducted RF</td>
<td>IEC 61000-4-6</td>
<td>3 V(d) (150 kHz to 80 MHz)</td>
<td>A</td>
</tr>
<tr>
<td><strong>I/O signal/control connected directly to mains supply</strong></td>
<td>Burst</td>
<td>IEC 61000-4-4</td>
<td>1 kV(5/50 ns, 5 kHz)</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Surge</td>
<td>IEC 61000-4-5</td>
<td>0.5 kV(a)/1 kV(b)</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>Conducted RF</td>
<td>IEC 61000-4-6</td>
<td>3 V (150 kHz to 80 MHz)</td>
<td>A</td>
</tr>
</tbody>
</table>

a) Line to line.
b) Line to earth (ground).
c) Only in the case of long-distance lines (see 3.6).
d) Only in the case of lines >3 m.
e) 25/30 cycles” means “25 cycles for 50 Hz test” and “30 cycles for 60 Hz test.”
## Electrical Safety Process

**Official Journal For the Low Voltage Directive**

<table>
<thead>
<tr>
<th>Cenelec</th>
<th>EN 61010-1:2001</th>
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<th>Cenelec</th>
<th>EN 61010-2-020:1994</th>
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</tbody>
</table>
Electrical Safety Process

- Example- EN 61010-1
  - Already CE Labeled vs. Non-labeled Subsystems
  - Construction Review
  - Initial Critique Letter
  - Modifications/Changes
  - Testing
  - Final Report
  - DOC
  - CE Mark
Electrical Safety Process

- **EN 61010-1 Construction Review** (for example)
  - **Certified Components**
    - Line Voltage components, MOVs, Transformers, Filters
    - Plugs, cords & receptacles (IEC 320)
    - Example TUV, VDE, Demko
  - **Circuit Breaker Reaction times**
  - **Wiring**
    - Colors, ie. Protective Earth (Green-Yellow)
    - Wiring certification
  - **Printed Circuit Boards**
    - Flammability rating > FV-1 (IEC 6070)
    - Spacings, clearances & creepage
  - **Markings**
    - Warnings & safety symbols, grounding symbols
  - **Identification of accessible parts**
  - **Mechanical Hazards**
  - **Radiation, laser, sonic, ultrasonic hazards**
Electrical Safety Process

- **EN 61010-1 Testing** (for example)
  - Tilt test: Tip 10deg, push sides @ 250N
  - 800N downward test
  - Static Test (30N with 12mm dia rod)
  - Dynamic Test (0.5kg steel sphere from 1m)
  - Maximum Rated Power
  - Temperature Test - Metal surfaces, knobs, handles
  - Abnormal Operation Test - stop cooling fans, watch temp rise, fire
  - Dielectric Strength
  - Ground Bonding - 10Amps PE terminal to metal enc. Measure impedance.
  - Durability of Markings
  - Voltage of inlet terminals after 10sec after disconnection
  - Transformer abnormal (shorts & overload)
Documentation

- Complete all analysis and testing
- Generate test reports
- Prepare all documentation into a technical file
  - Identification of Product (“unambiguously linking tech doc & prod”)
  - General description of apparatus.
  - Test Plans
  - Test report
  - Analysis, if harmonized standards not applied
  - Notified Body or Conformity Assessment Body Opinion (if required)
  - Users Manual (At least one MS language)
- Prepare the DOC - per EN17050-1 & 2
  - Reference to directive
  - Identification of apparatus
  - Name and address of manufacturer (or authorized rep in EU)
  - Dated reference to specifications
  - Date of declaration
  - Signature- Person empowered to bind mfg or rep
- Apply CE Mark
Sample Declaration of Conformity

EC Declaration of Conformity

We, the undersigned,

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Tokyo Apparatus Ltd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address, City</td>
<td>Nagata-cho 1-11-35, Chiyoda-ku, Tokyo</td>
</tr>
<tr>
<td>Country</td>
<td>Japan</td>
</tr>
<tr>
<td>Phone number</td>
<td>+ 81 1234567</td>
</tr>
<tr>
<td>Fax number/e-mail</td>
<td>+ 81 7654321</td>
</tr>
<tr>
<td>Authorised representative in Europe</td>
<td>Mr. E. Veen, Director TAL Europe B.V.</td>
</tr>
<tr>
<td>Address, City</td>
<td>Emissionstreet 2, Immunitytown</td>
</tr>
<tr>
<td>Country</td>
<td>Belgium</td>
</tr>
</tbody>
</table>

certify and declare under our sole responsibility that the following apparatus:

<table>
<thead>
<tr>
<th>Description</th>
<th>Seminar Presentation Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>Tokyo Apparatus Ltd.</td>
</tr>
<tr>
<td>Brand</td>
<td>Honshu</td>
</tr>
<tr>
<td>Identification</td>
<td>Model De Luxe</td>
</tr>
<tr>
<td>Restrictive use</td>
<td>For residential and office environment only</td>
</tr>
</tbody>
</table>

conforms with the essential requirements of the EMC Directive 2004/108/EC, based on the following specifications applied:

EU Harmonised Standards

EN 55099:2009
EN 55099:2010
EN 55088:2008

and therefore complies with the essential requirements and provisions of the EMC Directive.
Documentation

- “Hold technical documentation at the disposal of the authorities for 10 years after last manufacture date”
- One person *in community* responsible for making information available.
- In a reasonable amount of time.
- Technical file can reside with manufacturer.
- Tech file or DOC does not have to accompany apparatus
- No legal obligation (under directive) to make available tech documentation to customers.
Information

- Europa Web Site
  - Guide to EMC Directive
  - Guide to Low Voltage Directive
  - Blue Guide- New Approach
  - Latest Official Journals
  - Copies of Directives
  - Presentations

- NIST Web Site
  - NIST.gov -> Conformity Assessment
Questions?
Thank you for your time.