

WRBRF-2016

Safety related international standards

Battery Association of Japan
International Battery Standard Committee
Hiroataka Shima

Contents

1. Introduction
IEC SC21A

2. Existing safety standards
IEC 62133 Edition 2.0 2012-12

3. Work program for safety standards

4. Safety standards for portable applications
IEC 62133-1 for Ni systems
IEC 62133-2 for Li systems

5. Safety standards for industrial applications
IEC 62619 as umbrella standard
IEC 63056 for electrical energy storage systems
IEC 63057 for road vehicles not for the propulsion
IEC XXXXX as umbrella standard for Ni-MH

6. IEC standard of marking symbols for identification

1. Introduction

Scope of IEC SC21A :

“To prepare standards regarding product and test specifications for all secondary cells and batteries of sealed and vented designs containing alkaline or other non-acid electrolytes. To support other technical committees standardizing application oriented systems using secondary cells and batteries”

- **Secondary cell and batteries**
- **Sealed and vented design**
- **Alkaline or other non–acid electrolytes**

➔ **Safety standards of Ni-Cd, Ni-MH and Li-ion have to be developed in SC21A.**

2. Existing safety standard in IEC SC21A

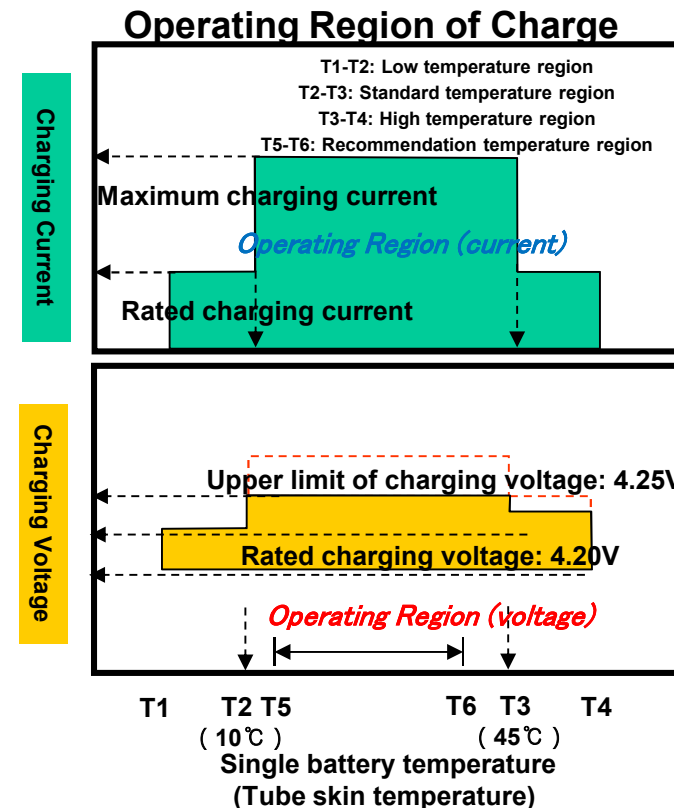
IEC 62133 Edition 2 (published in 2012.12)

Safety requirements for portable sealed secondary cells, and for batteries made from them, **for use in portable applications**

IEC 62133 Ed.2 includes new important requirements of cell operating region and FISC (Forced Internal Short Circuit) test.

■ **Cell operating region:**
To define the safe area of voltage, current and temperature range by cell manufacturer.

■ FISC Test



2. Existing safety standard in IEC SC21A

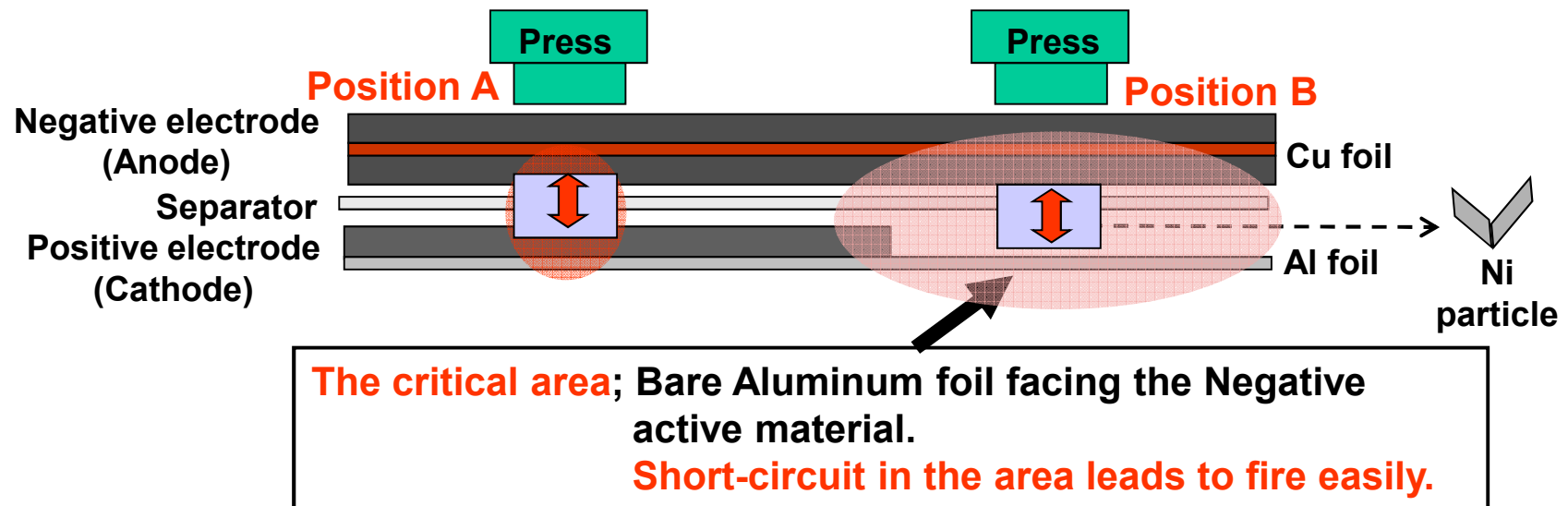
IEC 62122 Ed.2 includes new important requirements of cell operating region and FISC (Forced Internal Short Circuit) test.

■ Cell operating region

■ FISC test

FISC test was developed in JIS C 8714 and has been mandatory by law in Japan since 2008. The number of incidents has been decreased significantly since there in Japan

→ To introduce in IEC 62133 Ed. 2 by Japan NC.



3. Work program for safety standard in IEC SC21A

Project Reference	Initial Date	Current Stage	Project Leader
IEC 62133-1 Ed. 1.0 Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications - Part 1: Nickel systems	2013-11	Approved for FDIS circulation 2015-10	Ms. Florence (USA)
IEC 62133-2 Ed. 1.0 Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications - Part 2: Lithium systems	2013-11	Approved for FDIS circulation 2015-10	Ms. Florence (USA)
IEC 62619 Ed. 1.0 Safety requirements for large format secondary lithium cells and batteries for use in industrial applications	2012-11	Approved for FDIS circulation 2015-10	Mr. Bodet (France) Mr. Inoue (Japan)
IEC 63056 Ed. 1.0 Safety requirements for secondary lithium cells and batteries for use in electrical energy storage systems	2016-04	Approved NP 2016-04	Mr. Oota (Japan)
IEC 63057 Ed. 1.0 Safety requirements for secondary lithium batteries for use in road vehicles not for propulsion	2016-04	Approved NP 2016-04	Mr. Maeda (Japan)

4. Safety standards for portable applications

Revised version of IEC 62133 Ed. 2

→ IEC 62133-1 and IEC 62133-2 **for portable applications**

- **To separate for Nickel systems and Lithium systems.**
- **To include button/coin cells.**

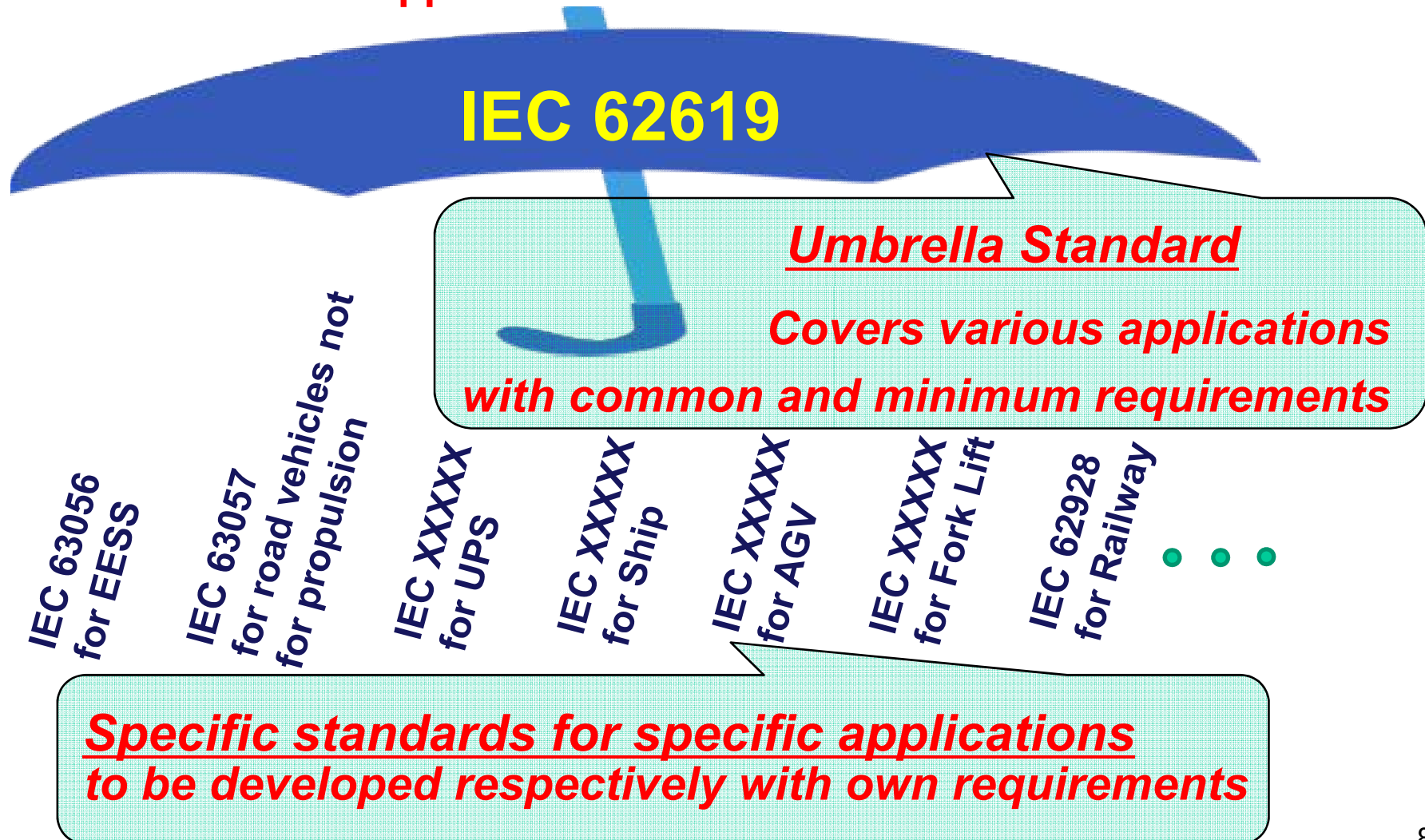
The contents are almost same as IEC62133 Ed. 2.

- **IEC 62133-1 Ed.1: For Nickel systems**
FDIS: To be circulated end of December 2016.
IS: To be published March 2017
- **IEC 62133-2 Ed.1: For Lithium systems**
FDIS: To be circulated end of November 2016.
IS: To be published February 2017

5. Safety standards for industrial applications

IEC 62619 Ed.1

Safety requirements for large format **secondary lithium cells and batteries for use in industrial applications.**



5. Safety standard for industrial applications

IEC 62619 includes the new important test requirements of propagation test and for BMS (Battery Management System)

- **To develop as a option, either “FISC test” or “Propagation test”**
- **To develop BMS test requirements**

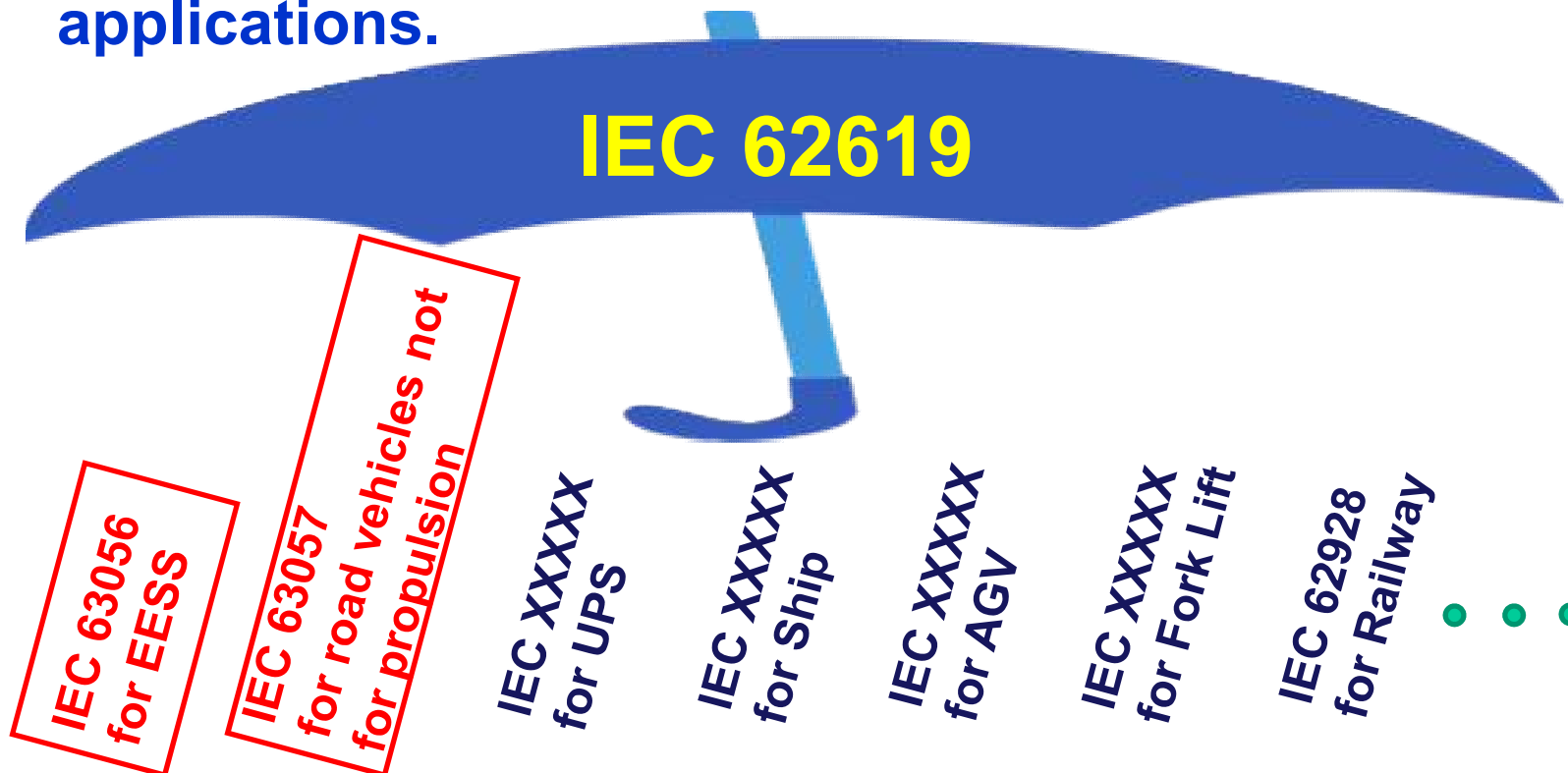
IEC 62619: For industrial applications (Umbrella standard)

- **FDIS: To be circulated end of November 2016**
- **IS: To be issued February 2017**

5. Safety standard for industrial applications

New projects for LIB

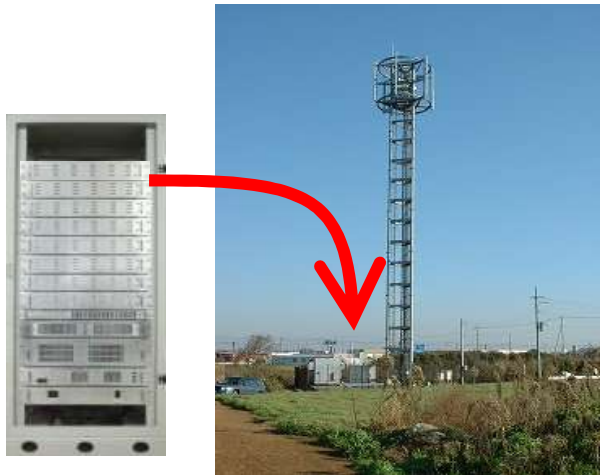
- IEC 63056: For Electrical Energy Storage Systems
 - IEC 63057: For Road Vehicles not for the propulsion
- These standards are under umbrella of IEC 62619 and require additional or specific requirements for those applications.



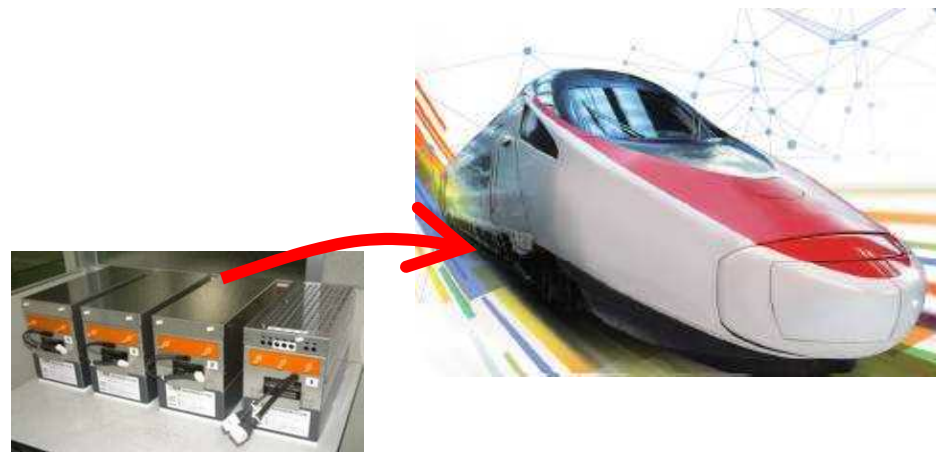
5. Safety standard for industrial applications

New proposal of safety standard for Ni-MH

The nickel metal hydride (Ni-MH) cells and batteries are used across a wide range of stationary and motive applications.



Large base station



Auxiliary power supply system in train

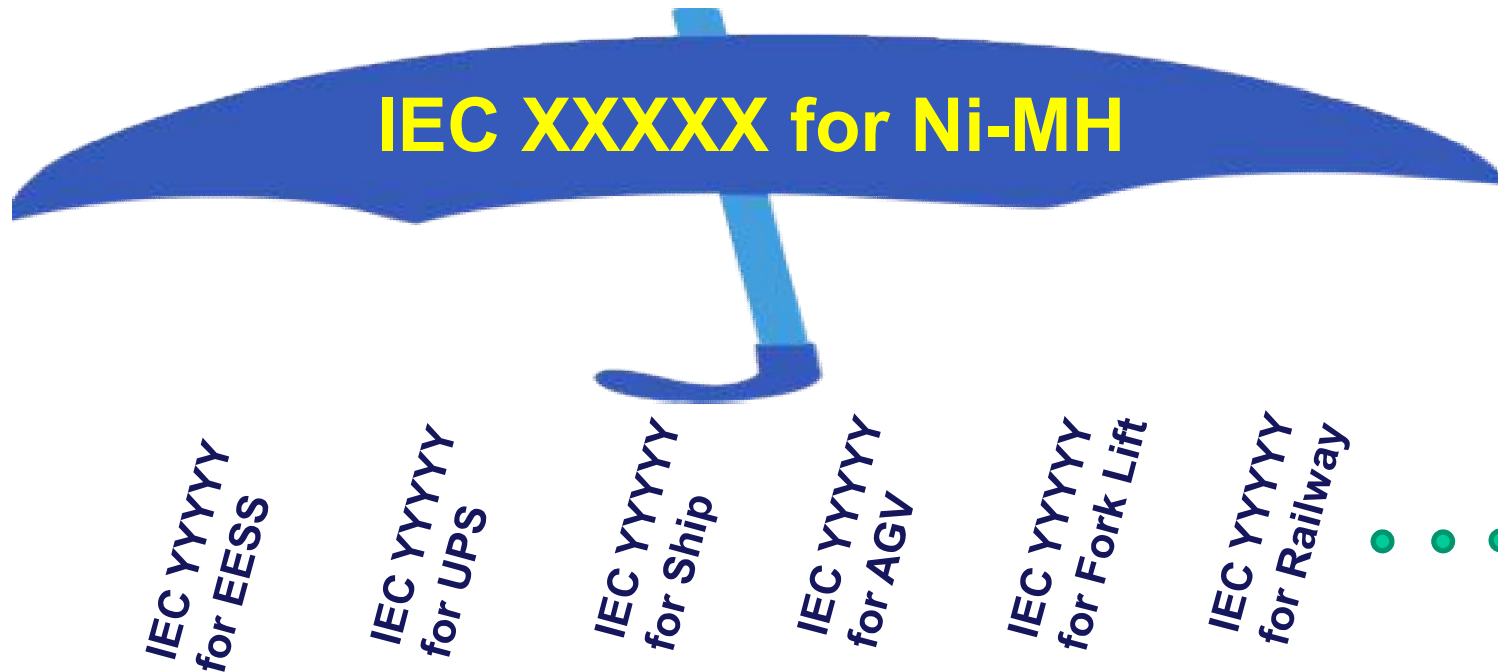
However, there is no international standard for sealed Ni-MH cells and batteries used in industrial applications.

➔ **Need for new standard of Ni-MH for industrial applications.**

5. Safety standard for industrial applications

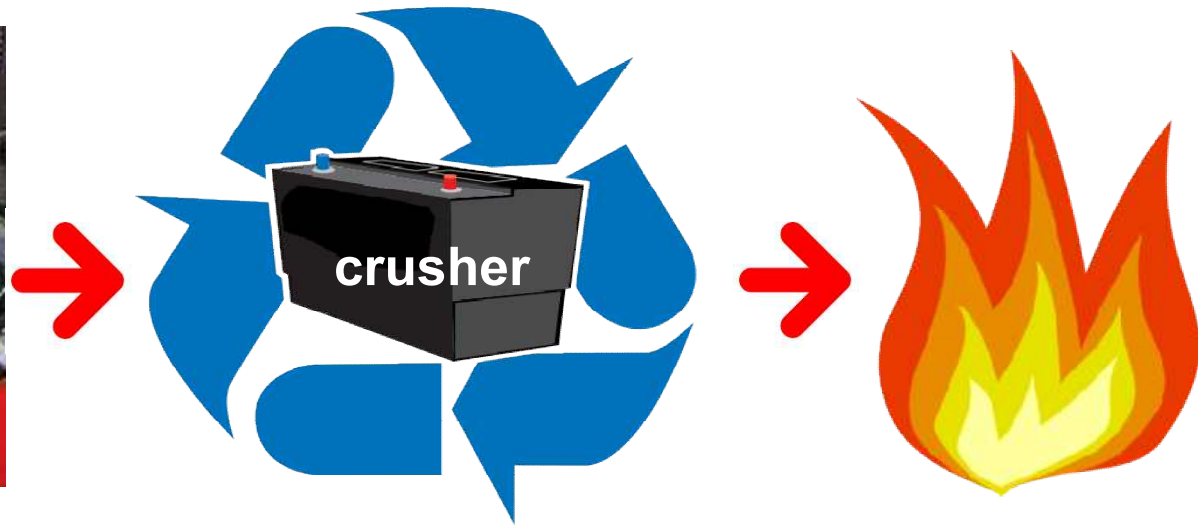
New proposal of safety standard for Ni-MH

- New standard will be developed by Korea with Japan as a umbrella standard similar to IEC62619.
- NP will be circulated in December 2016.
- New proposal will be presented in next SC21A meeting on December 2016 at Frankfurt.



6. International marking standard required

Background



6. International marking standard required

Example:

Marking symbols for identification of their chemistry for portable rechargeable batteries in Japan



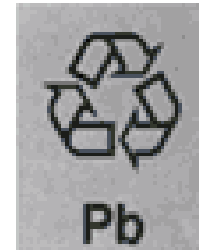
Nickel-cadmium
battery



Nickel-metal
hydride battery



Lithium-ion
battery



Portable sealed
lead-acid battery

Japan-only recycle markings

6. IEC standard of marking symbols for identification

IEC 62902 Ed.1

Secondary batteries: Marking symbols for identification of their chemistry

Scope:

- **secondary** cells, batteries, battery modules and monoblocs
- a volume of **more than 900 cm³**.

Work program of IEC 62902 Ed. 1

NP: Approved in September 2015

1st CD: Circulated in November 2015

2nd CD: Circulated in July 2016

*Many comments (more than 150) were submitted.

Next TC21 WG meeting: November 2, 2016 in Tokyo

6. IEC standard of marking symbols for identification

■ Marking symbols

- Option 1: Symbols without recycling symbol



- Option 2: Symbols with recycling symbol ISO 7000-1135



- Colors of background
➔ Under discussion

Thank you very much for your attention