

Consideration for Safety Standard of RESS

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Transmitted by
Japan Automobile Standards Internationalization Center (JASIC)

Basic Thought of Japan

- World-wide Harmonization is important
 - ◆ Rapid growth of EV/PHEV/HEV market in various regions
- Reasonable, Effective and Practicable requirements
 - ◆ Examine status of development of existing regulations or standards
 - ◆ Seek for harmonization and reciprocal arrangement with UN38.3 for Li-ion

Scope and Approach

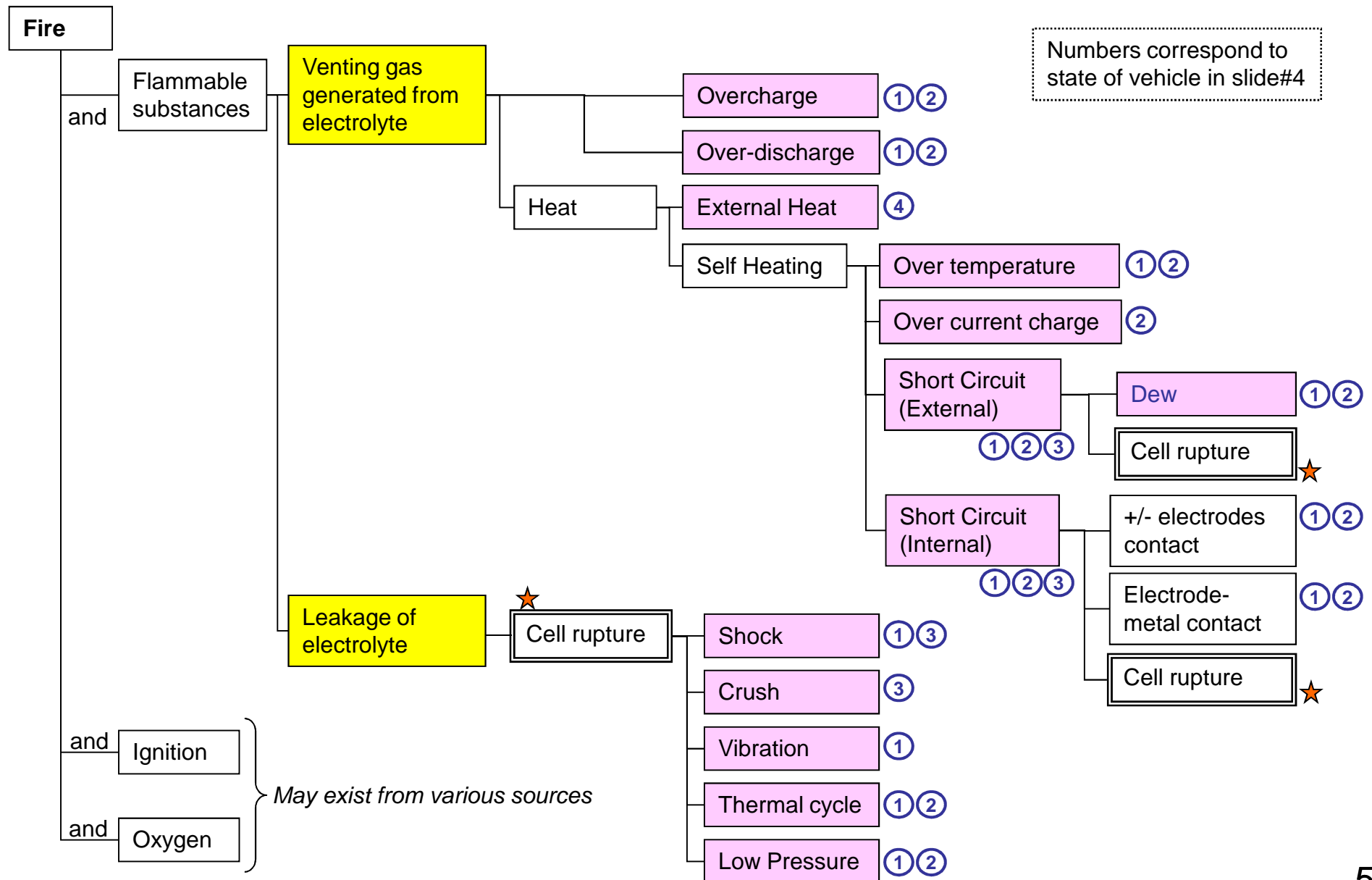
- Define presumed conditions
 - ◆ Ensure safety while RESS is installed on vehicle
- Examine of potential risk and countermeasure according to type of battery chemistry with Prioritization (i.e. Li-ion)
 - ◆ Non-water based electrolyte (e.g. Li-ion)
 - ◆ Water based electrolyte (e.g. NiMH, Lead-acid)
 - ◆ Molten salt, Molten metal (e.g. ZEBRA, NaS)
- Adequately apply functional requirement or structural requirement

Potential Safety Risks and relevant ECE Regulations

State of vehicle	Potential Safety Risks	Type of storage device and applicable ECE Regulations		
		RESS (Electricity)	Liquid Fuel Tank	LPG/CNG Container
Normal (Running order)	Electric shock	R100-01	(Not Applicable)	(Not Applicable)
	Hydrogen Emission	R100-01	(Not Applicable)	(Not Applicable)
	Fire/explosion Leakage (spillage) Other causes (overcharge)	<To be addressed by this group> ①	R34	R67/R110
Normal (Recharge/Refuel)	Electric shock	R100-01	(Not Applicable)	(Not Applicable)
	Hydrogen Emission	R100-01	(Not Applicable)	(Not Applicable)
	Fire/explosion Leakage (spillage) Other causes (overcharge)	<To be addressed by this group> ②	R34	R67/R110
Post-crash	Electric shock	R12-04/R94-02/R95-03	(Not Applicable)	(Not Applicable)
	Fire/explosion Leakage (spillage) Other causes	[R94/R95] <To be reconsidered by this group> ③	R34 [R94/R95 (leakage)]	[R67/R110 (strength/layout)]
	Intrusion into cabin	R12-04/R94-02/R95-03	(not specifically addressed)	R67/R110
Unusual circumstance	Explosion in exposure to fire	<To be addressed by this group> ④	R34 (only for plastic tanks)	R67/R110

Fire/Explosion is the potential risks to be addressed, where definition of “Fire” and “Explosion” to be agreed

FTA resulting "Fire" of Li-ion Battery



Phenomena to be examined

Phenomenon of Battery	State of vehicle				Functional Requirement	Structural Requirement
	①	②	③	④		
	Running order	Recharge	Post-crash	Unusual circumstance		
Overcharge	●	●		○ (EVSE)	●	
Over-discharge	●	●		○ (EVSE)	●	
External heat				●		●
Over temperature	●	●			●	
Over current charge		●		○ (EVSE)	●	
Short circuit (external)	●	●	●		●	●
Dew condensation	●	●				●
Short circuit (internal)	●	●	●			●
Shock	●		●			●
Crush			●			●
Vibration	●					●
Thermal cycle	●	●				●
Low-pressure	●	●				●

Next Step: Examine existing standards for each phenomenon