

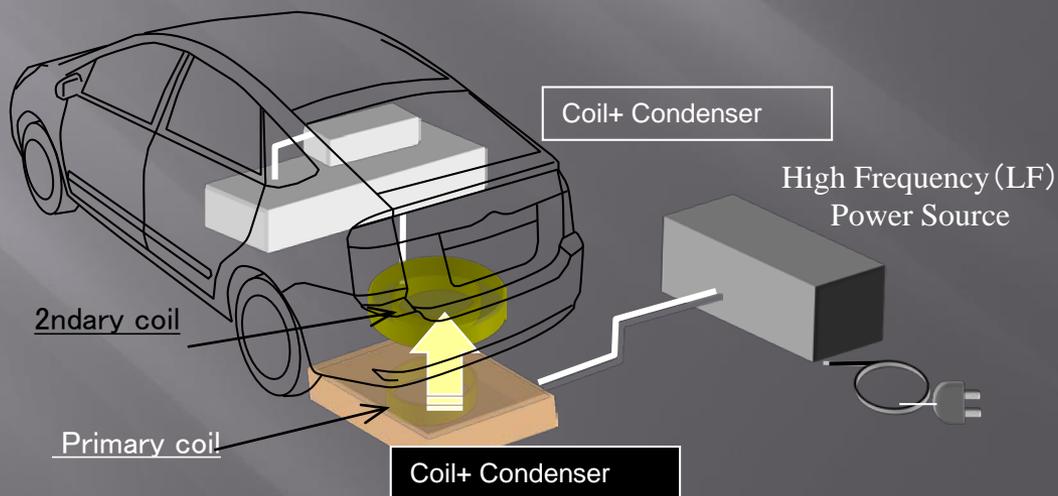
# WPT STANDARDIZATION APPROACH

Progressing Towards Commercialization

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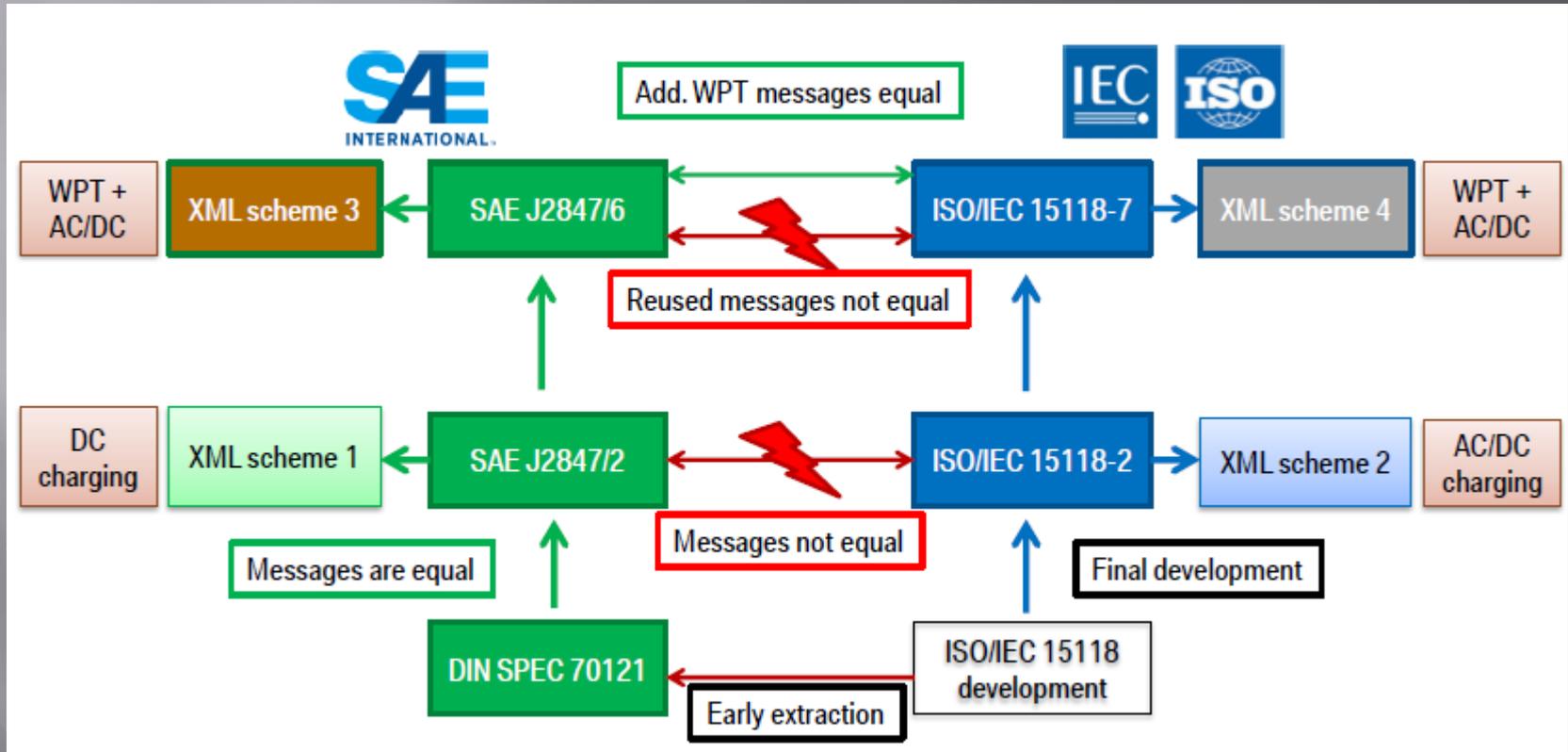




# Minimum Interoperability Requirements

- ▣ Communication (SAE J2847/6, ISO/IEC 15118-7)
- ▣ Comply with EMC/EMI Requirements (Incl. FCC Part 18)
- ▣ Comply with Human Exposure Limits (ICNRP2010) and Medical Device Exposure Limits.
- ▣ Achieve Power Transfer Performance Targets
  - Single Frequency (85kHz)
  - Minimum Efficiency
  - Defined Alignment (X,Y,Z)
  - Within Packaging Constraints of OEMs.
  - Standardized location in parking spot/vehicle.

# Communication Standard Harmonization

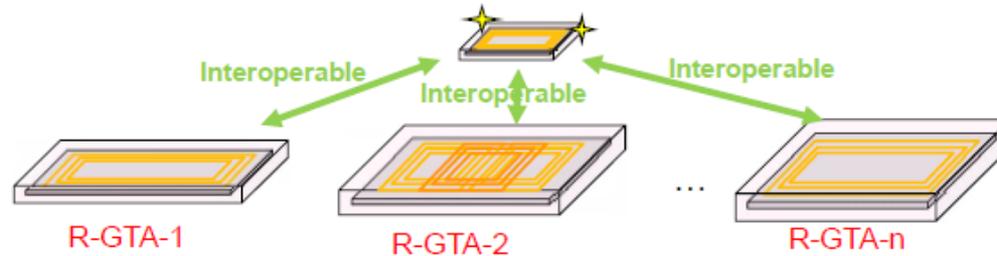


# Minimum Interoperability Requirements (SAE/DOE/INL Testing Summer 2016)

Specify the **Master-VRA** : One per class (power / gap)



Specify the **Reference-GTA's** : At least one per class, work with M-VRA



- Drawings and sizes of geometries of coil, incl. type and amount of material (e.g. ferrite, Al, Litz wire, windings, etc) ( $L_1$ )
- Tuning topology and specs. ( $C_1$ )
- $L_{i1}$  and  $C_1$  tolerance
- Impedance range ( $\Delta Z_1$ ) within which the R-GTA electronics can drive the R-GTA coil to transfer the power (to the M-VRA)

The allowed max  $I_1$  and max ( $I_{inv} \times V_{dc}$ ) will result in a certain  $Z_1$  range that the R-GTA can handle (so no need to specify, but as information)

$$\text{[at resonance (and series-series) } Z_1 = \frac{k^2 \omega^2 L_1 L_2}{Z_2} \text{]}$$

- Max temperature of internal parts (related to max  $I_1$ )

# Topics Under Development/Resolution

1. Communication Standardization (harmonize with ISO/IEC) Activity 6 Mos.
2. FCC Part 15/18 Threshold defn., and measurement (ANSI C63.30)
3. Additional discussions/negotiations/perhaps a petition needed with FCC, FDA
  - a. High Power Scaling Factor.
  - b. Management of ~1000 Med. Device Compliance
4. Device Technical Requirements. Draft being prepared by OEMs (L1 Priority)
  - a. M-VRA Specs.
  - b. Interoperability Tolerance Definition (R-GTAs.)
  - c. Qualification Process.
  - d. FOD Requirements, test criteria.
5. Z3 Direction TBD.
6. VRA Location On Vehicle – Standard TBD. (i.e. 200m behind front axle.)
7. Interference with other vehicle devices (Keyless Entry, TPMS.)
8. SAE J2954 TIR to be published 3<sup>rd</sup> quarter 2016.