

Paris Session
2022

HITACHI
Inspire the Next



How to achieve multi-vendor interoperability

Study Committee B4
DC systems and power electronics
PS1 – Question 13

Erik Kilander, Sweden

Group Discussion Meeting

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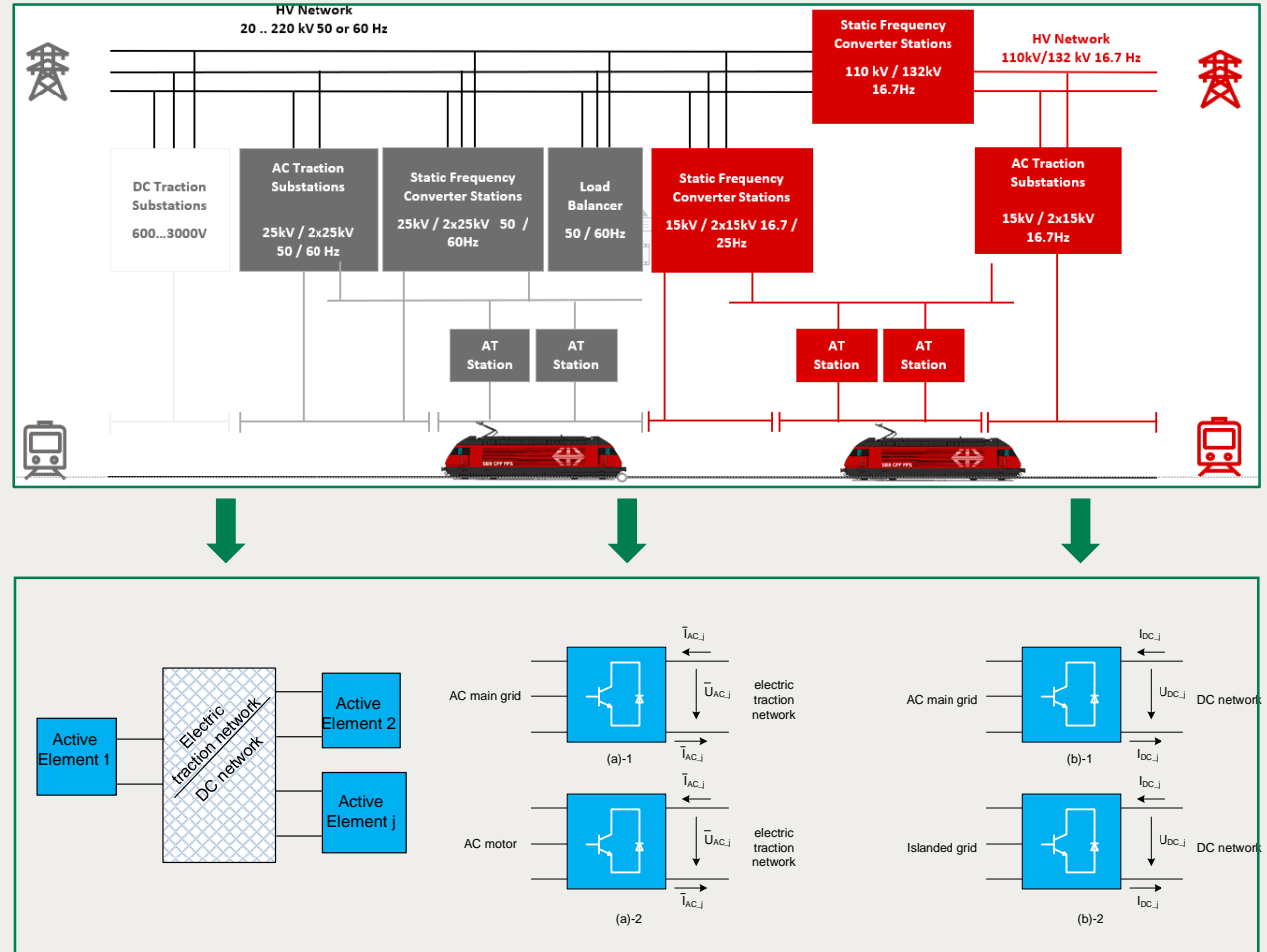
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 **Hitachi Energy**

Multi-vendor interoperability – yesterday

- Very similar and rich experiences from railway industry
- Stability analysis:
 - Impedance-based
 - Passivity-based
 - Eigenvalue-based
 - Time domain
- Already used on AC side
- Can be adopted on DC side



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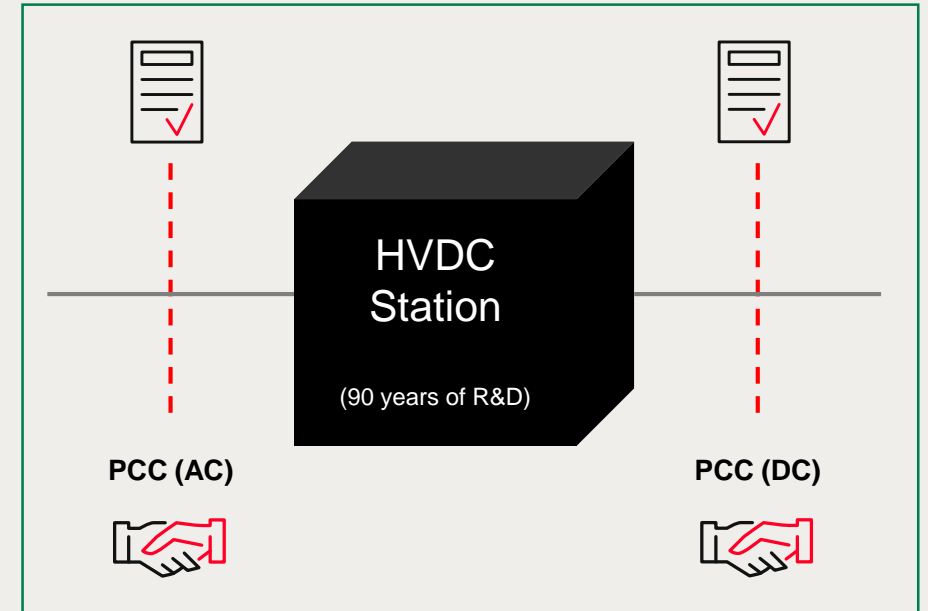
Multi-vendor interoperability – today

- Already established in several projects
- Models proven critical:
 - Vendor-vendor model exchange
 - 3rd party validation
 - New simulation approaches
- Maintenance services in place
- Must be treated like any other software

- Open code → removes R&D incentive
- Responsibility → still with manufacturer

Examples:

Dogger Bank A&B + WTG
Dogger Bank C + Sofia
Johan Sverdrup 1 + 2
DoWin5 + WTG

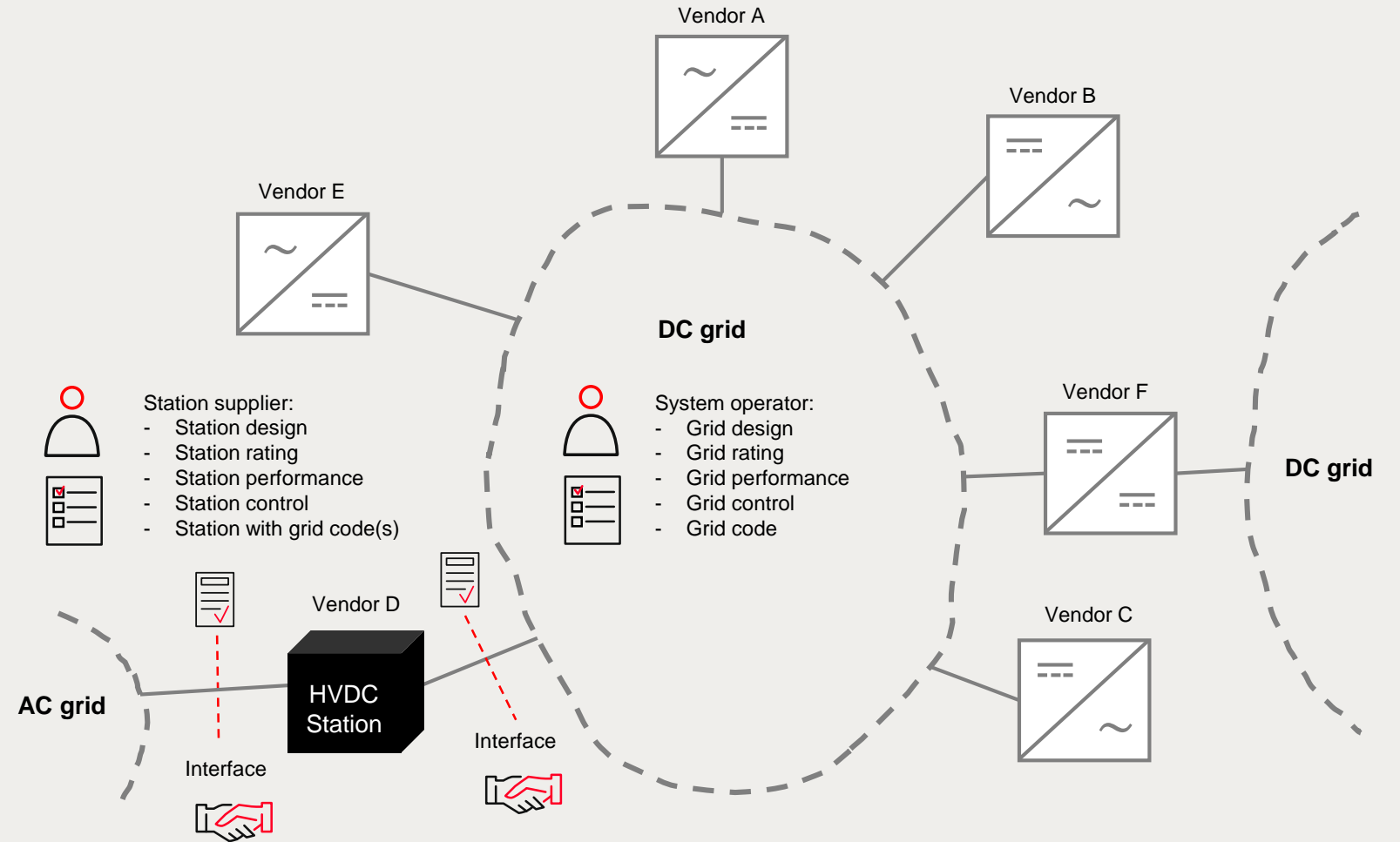


- Solution:
 - Standardization of interfaces, not standardization of solution
 - Allow vendor optimization based on functional specification
 - Further development to preserve innovation and competitive differentiation

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Multi-vendor interoperability – tomorrow

- Meshed multi-vendor DC grid
- "DC like AC"
- Guidelines exists
- Requires: DC grid operator



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