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Key Consideration of Under-Frequency Load Shedding Schemes for Ensuring Future Frequency Stability

SC C4 PS3 Q15

What system studies, success criteria, coordination and considerations shall be accounted for when designing special protection schemes or other critical system level protection for managing system stability as the power system and generation mix are changing rapidly?

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Key Consideration of UFLS Schemes for Ensuring Future Frequency Stability -Summary-

• **Large-scale integration of RESs could decrease system inertia, increasing the RoCoF following the loss of generation, causing large-scale self-disconnection of RESs and the risk of large-scale power outages.**

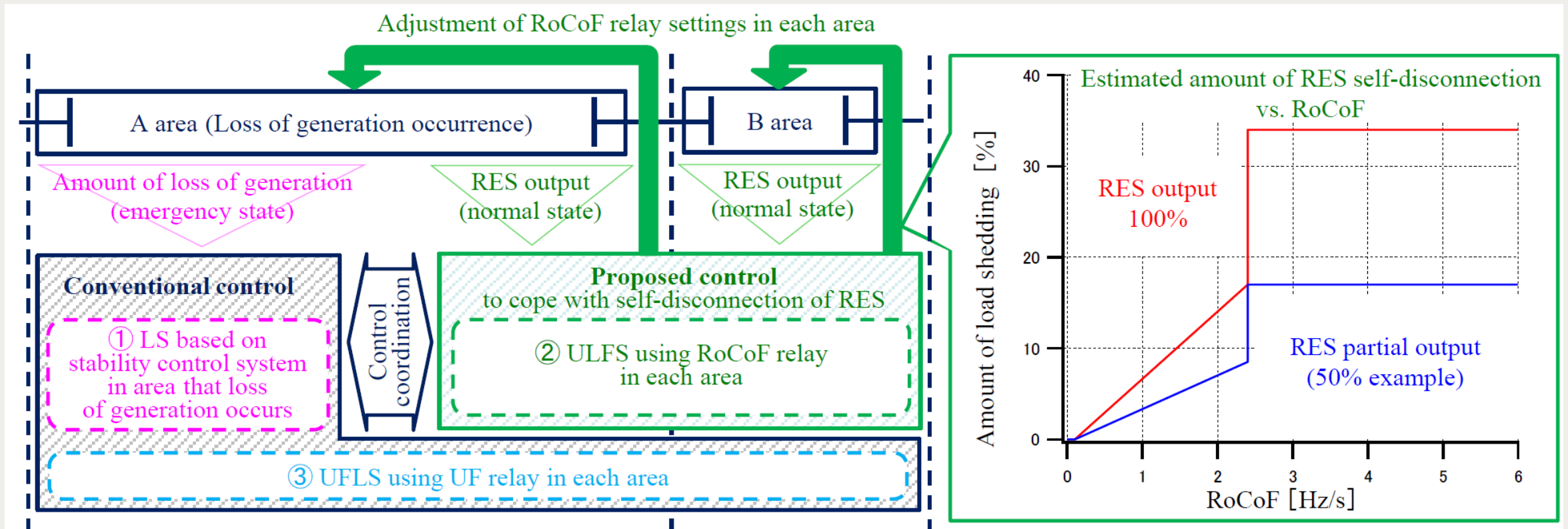
→ *The UFLS is required to **perform faster-response and maintain an accurate amount of load shedding (LS)** for various system statuses. The following are key considerations.*

- 1) **Use the RoCoF relay with the appropriate RoCoF calculation method** to ensure fast response and accuracy.
- 2) **Adjust relay settings according to system status** using information and communication technology to maintain an accurate amount of LS.
- 3) **Construct systems of UFLS scheme using IEC 61850** to ensure high interoperability to cope with future power system changes flexibility.

– Next, key considerations will be added with examples of the new proposed UFLS scheme.

Proposed Control Method for Enhancing UFLS in Future Systems

- *The RoCoF relay considering RES self-disconnection, characterized primarily by anti-islanding protection relay, is added to UFLS.*
- *The amount of LS is adjusted by changing the RoCoF relay settings in real-time according to an estimated amount of RES self-disconnection vs. RoCoF.*



Configuration of Proposed Control System for Ensuring High Interoperability

- Two systems (**LS system** and **Relay setting change system**) are needed in each substation.
- Two systems can be constructed at a **lower cost** and with **higher scalability** than before by using a configuration compliant with IEC 61850 (SV and GOOSE etc.).

