Paris Session 2022

# The concept of DCCB Key Performance Classes to enable MTDC protection interoperability

Study Committee A3

PS1 - Miscellaneous T&D equipment and systems

Q2: HVDC switching equipment is on the way to become ‘standardized’ technology. What are relevant issues or proposals for the standardization of HVDC switchgear?

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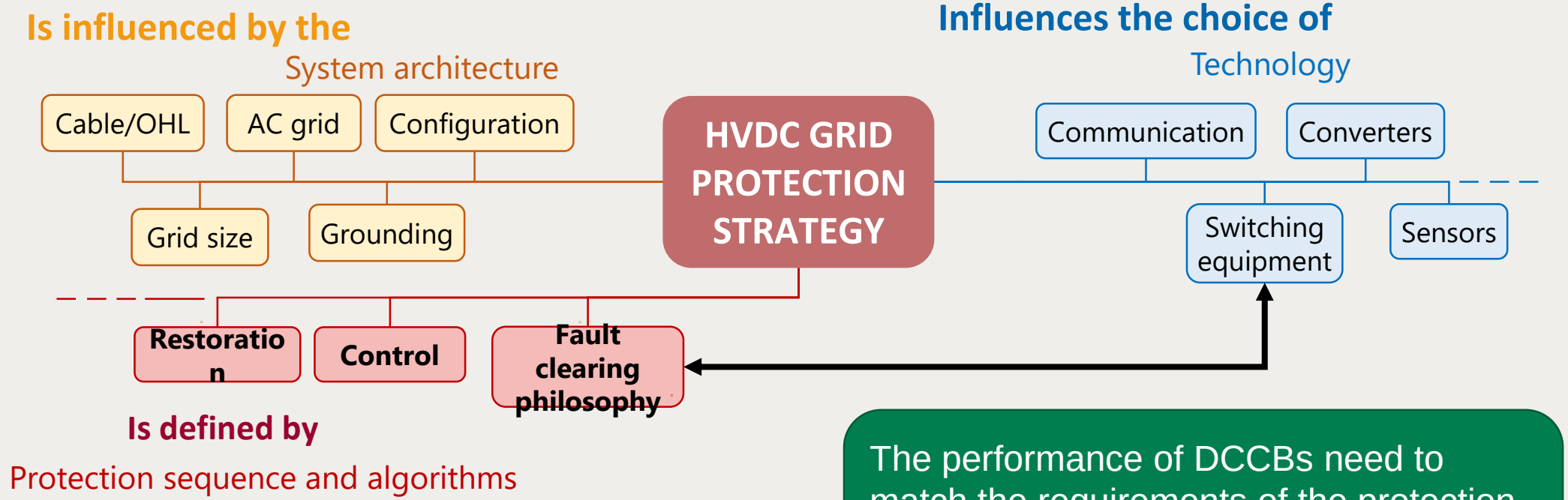
# Protection of Multi-Terminal DC (MTDC) grids




The performance of DCCBs need to match the requirements of the protection strategy in order to ensure interoperability in an evolving MTDC grid

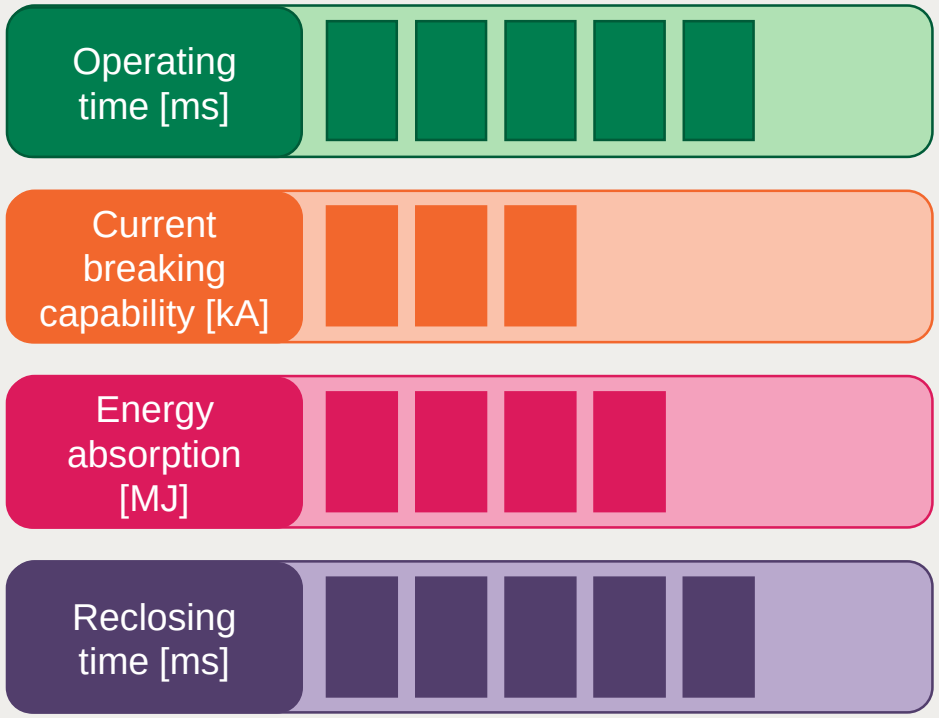
# The concept of DCCB Key Performance Classes (KPC)

DCCB performance requirements vary depending on AC system constraints and the MTDC protection concept

- Fault clearing philosophy
  - Non-selective
  - Partially-selective
  - Fully-selective
- Acceptable Converter blocking
  - None
  - Closest
  - All
- Fault limiting devices
  - DC reactor*
  - SFCL
  - None
- Grid configuration and extensions

*Respecting max. admissible size to ensure DC grid stability

- At system level the DCCB characteristics can be specified by several KPC



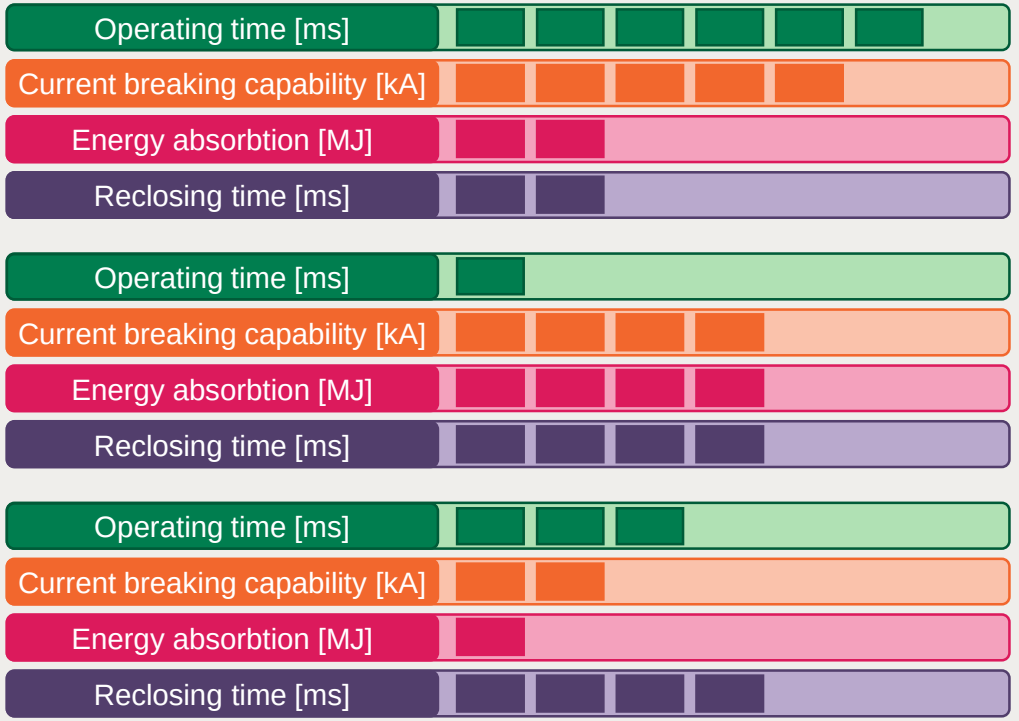
# The concept of DCCB Key Performance Classes

## Illustrative examples

| | |
|---|---|
| Fault clearing philosophy | Non-selective |
| Acceptable Converter blocking | All |
| Fault limiting devices | None |

| | |
|---|---|
| Fault clearing philosophy | Fully-selective |
| Acceptable Converter blocking | None |
| Fault limiting devices | DCR |

| | |
|---|---|
| Fault clearing philosophy | Fully-selective |
| Acceptable Converter blocking | None |
| Fault limiting devices | SFCL |



# Conclusions

The concept of DCCB Key Performance Classes

- Accelerates DCCB standardization from a system level perspective
- Enables systematic MTDC grid protection rollout
- Facilitates interoperability in MTDC grids