Paris Session 2022

Design considerations for S/S with SynCon´s with high inertia fly wheels

SC B3

Are there specifications and requirements for new applications (e.g. BESS and Sync Comps) and their role in power systems adequately well understood? Q 1.2

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Mechanical damage fly wheel protection

– Synchronous condenser data: 70 MVA base
  - H = 1.4 s & Inertia 8050 kgm² (only SC) - 4-pol machine
  - 99 MWs stored energy
– SynCon + Flywheel
  - H > 6 s & 470 MWs stored energy, Inertia 8050 + 30000 kgm²

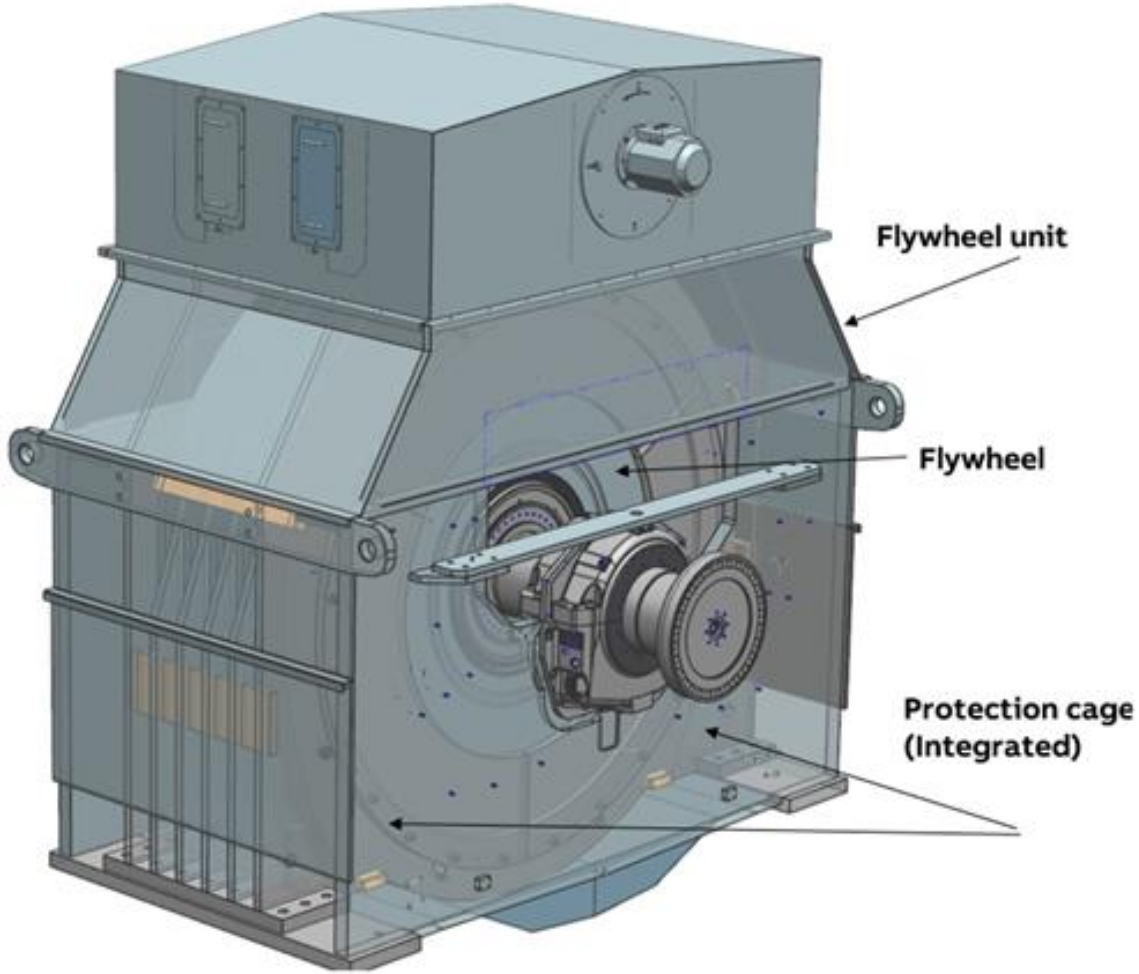


Figure 1: *Flywheel for synchronous condenser with integrated protection cage*

Synchronous Condenser Solution

Overview

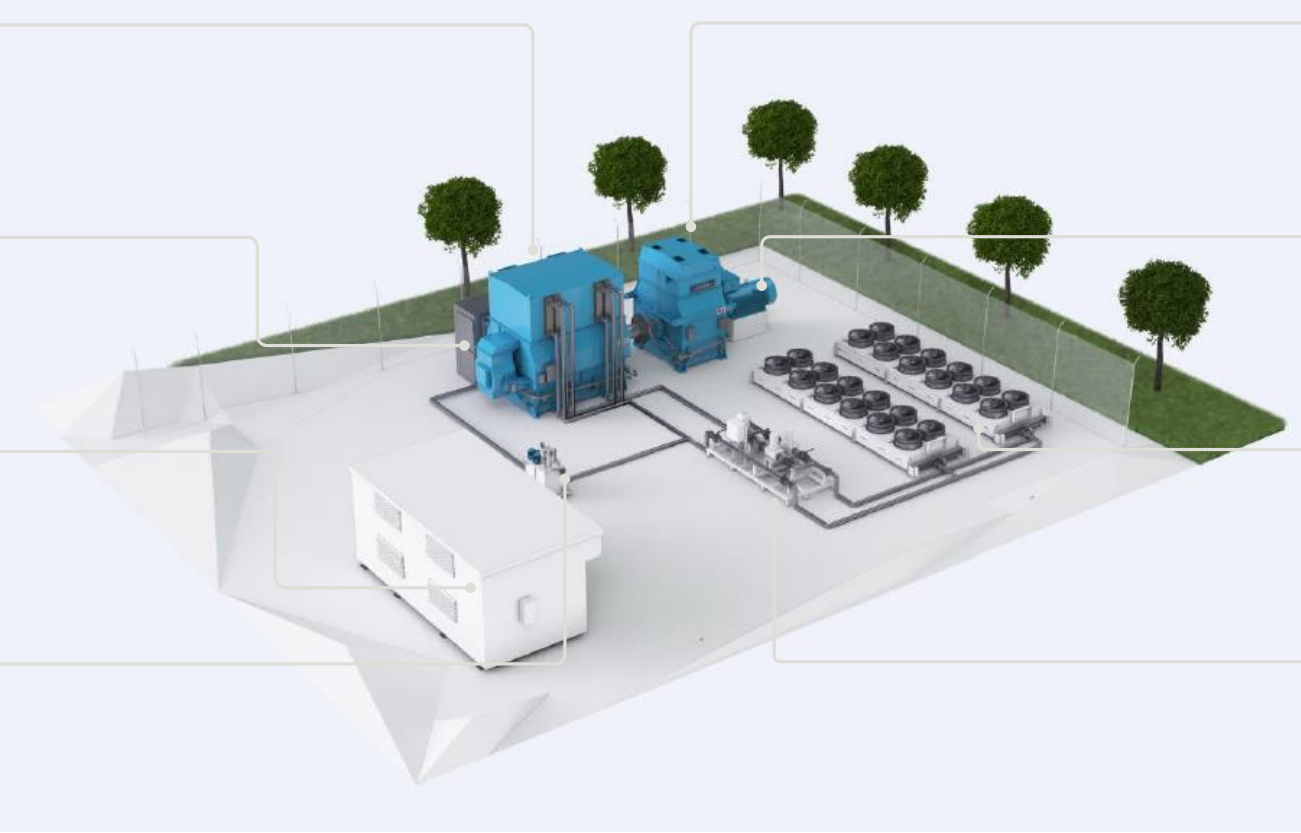
Synchronous Condenser
Up to 80 Mvar (higher output with parallel units)

Main terminal box
Increased SCC capability up to 80 kA

E-house
MV-switchgear with **generator circuit breaker**, Aux, power transformer, LV swgr, **UPS- system**, C&P panel with excitation system. Re-gerative VSD for the pony motor

Lube oil system
Forced lubrication for the bearings on the condenser and flywheel

Aux. Power supply with carefully dimensioned UPS-system



Flywheel (optional)
Total inertia up to 470 MWs with flywheel

Pony motor
Start via variable speed regulated pony motor

Air cooler units
Air cooling units to cool the cooling media

Pump unit
Redundant water pumps

Synchronous condenser substation - fault current considerations