SCiBreak
Enabling the Supergrid

The VARC dc circuit breaker

current status and plans for the future

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About SCiBreak

- SCiBreak develops technology for fast circuit breakers for use in DC and current-limiting AC applications.
- SCiBreak AB was founded in 2014 as a spin-out from KTH Royal Institute of Technology, Sweden.
- The name is derived from “Short-Circuit Interrupter/Breaker”.
- Currently seven people (full/part-time) working out of premises outside Stockholm.
- We are supported by the Swedish Energy Agency, Svenska Kraftnät –the Swedish National Grid, and European Institute of Innovation and Technology – EIT Innoenergy.
- Horizon 2020 PROMOTioN Project Partner.

The Team

More than 100 years of experience of research and development in power systems, current interruption and power electronics.

Our past is in organizations like ABB and KTH Royal Institute of Technology.

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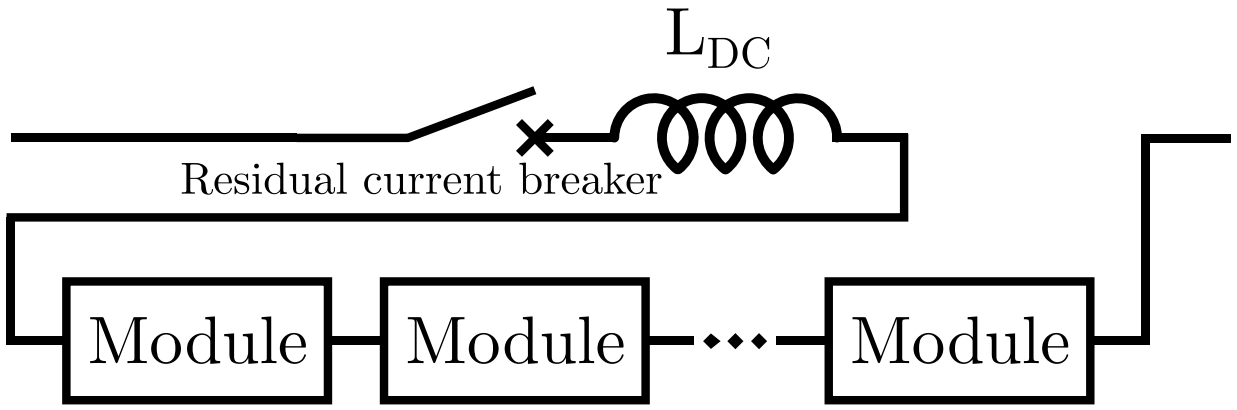
The VARC dc circuit breaker

The VARC dc CB consists of:

- Several series connected dc CB modules for interruption
- A normal ac circuit breaker for galvanic isolation after interruption and making
- If needed, a fault current limiting reactor



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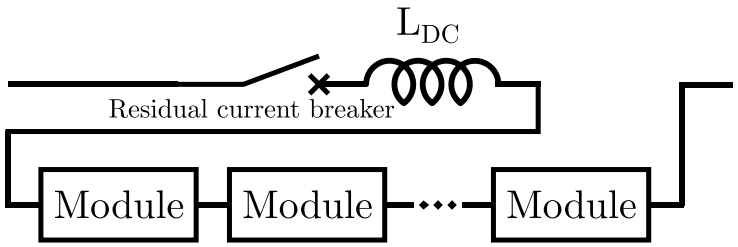
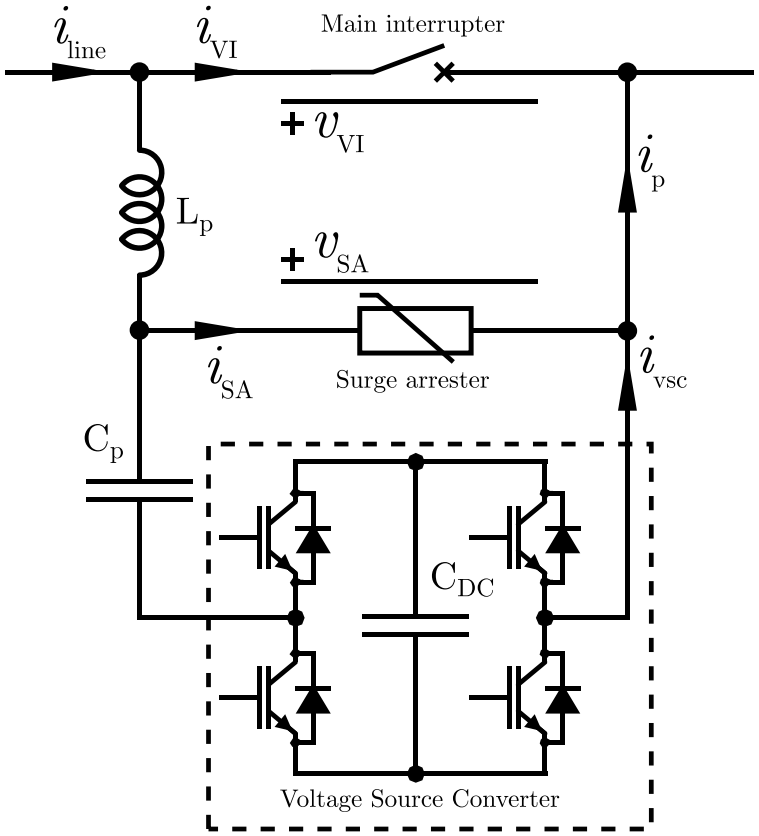
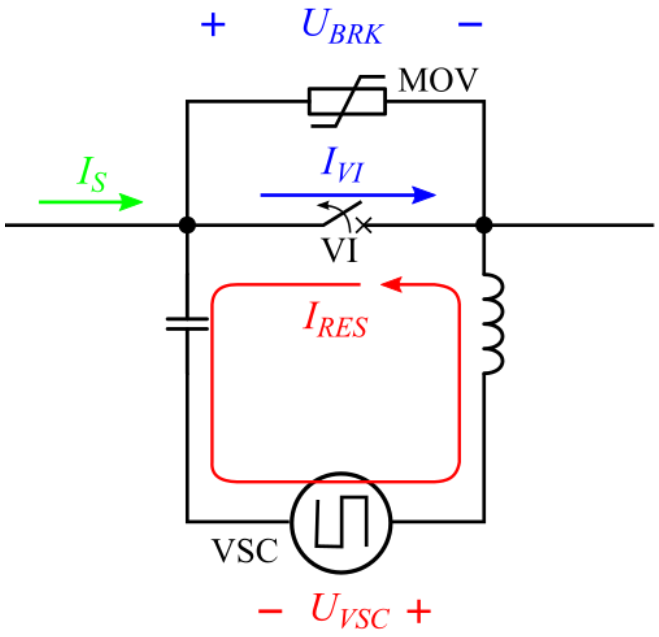
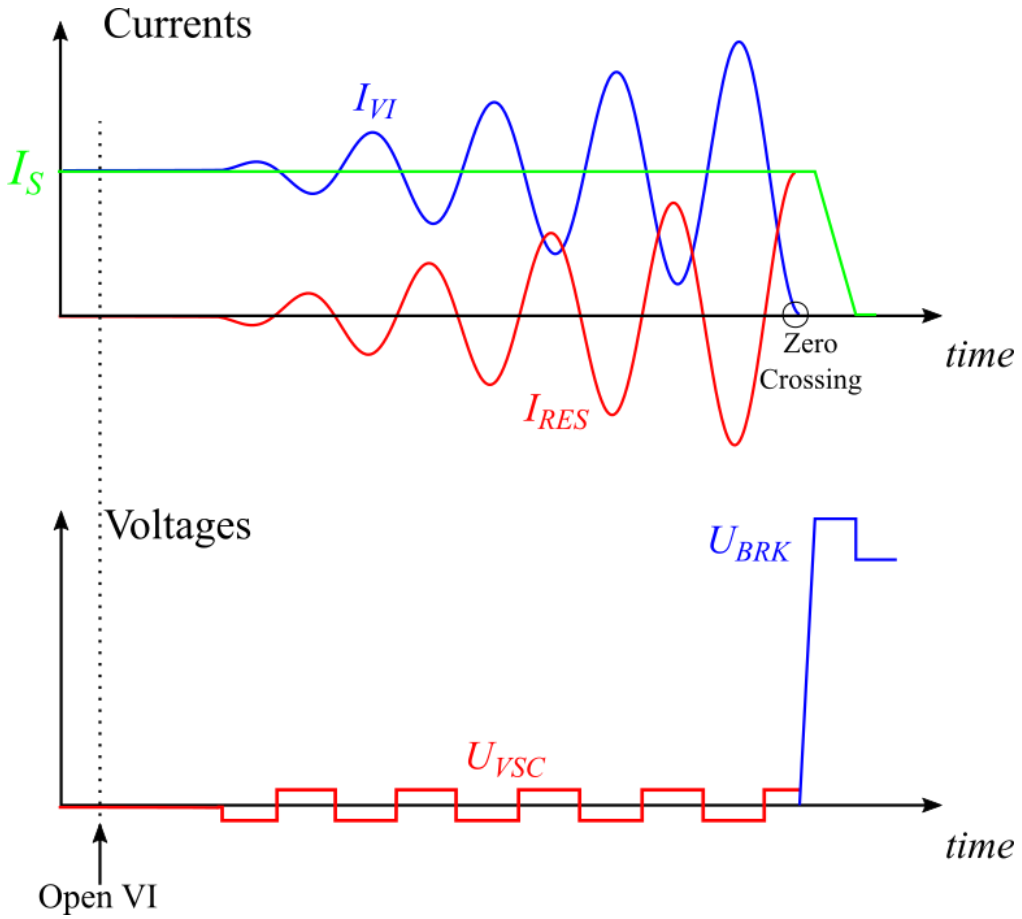


Outline of a dc CB module:



VSC-assisted Resonant Current (VARC) Interruption





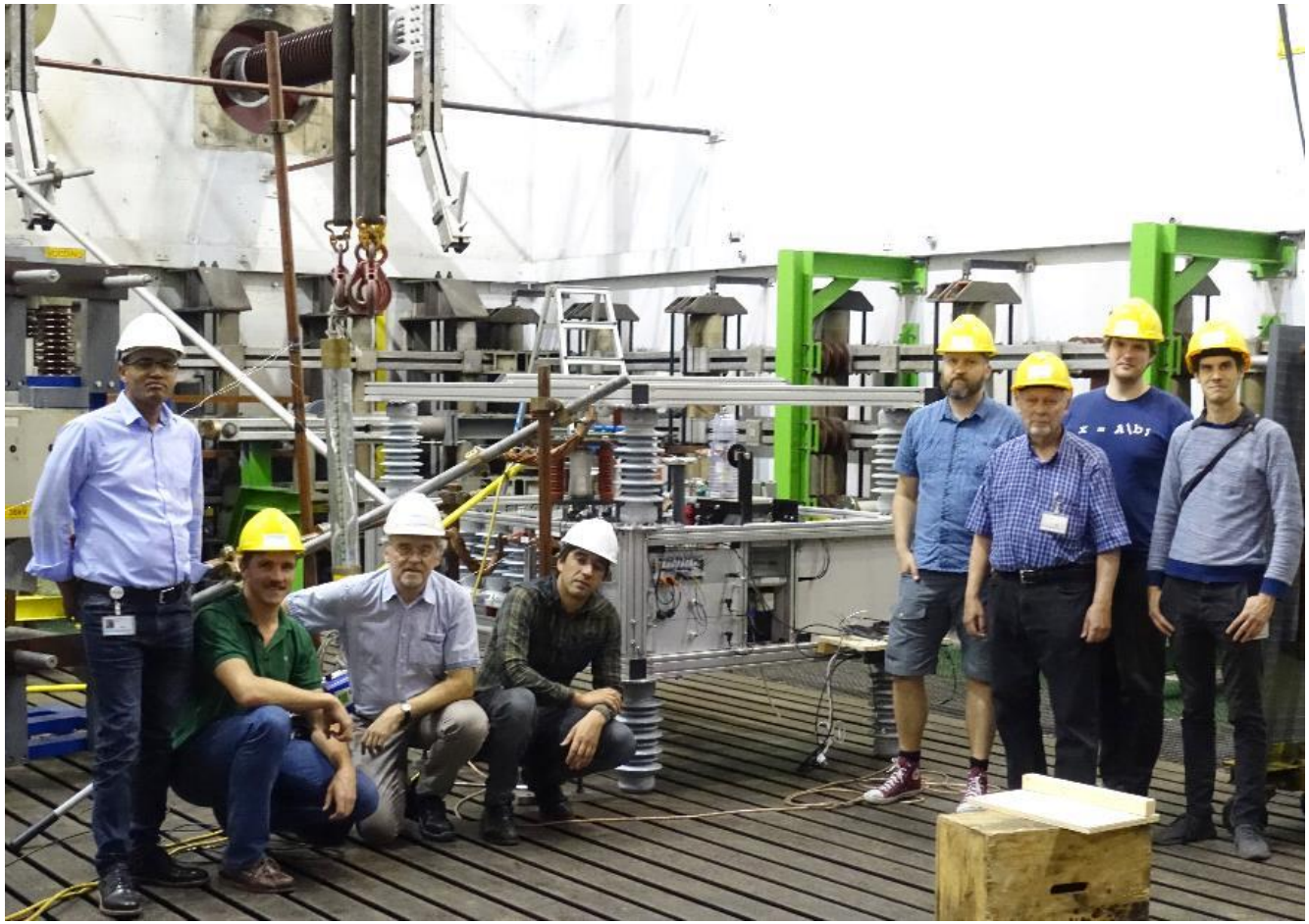
VARC Breaker Module

- 40 kV TIV
- 10 kA interrupted current
- < 3 ms neutralization time

size: 2.2 × 1.7 × 1.6 m³
weight: 800 kg
Modules stackable to form circuit breakers with arbitrary TIV.

Fast Circuit Breaker Module

Breaker Tested to 40 kV & 10 kA at DNV GL KEMA in June 2018.



HORIZON 2020 – WORK PROGRAMME 2014-2015

General Annexes

G. Technology readiness levels (TRL)

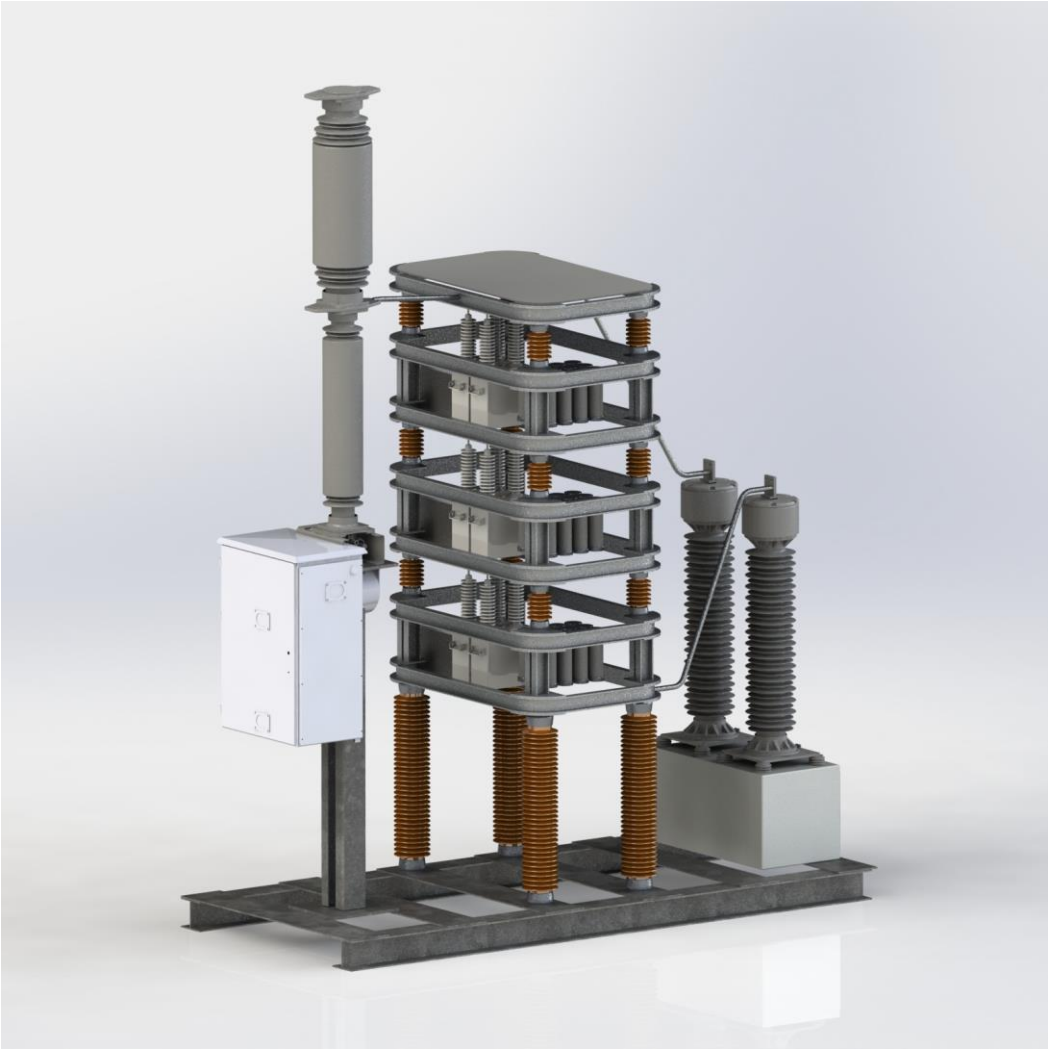
Where a topic description refers to a TRL, the following definitions apply, unless otherwise specified:

- TRL 1 – basic principles observed
- TRL 2 – technology concept formulated
- TRL 3 – experimental proof of concept
- TRL 4 – technology validated in lab
- TRL 5 – technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- TRL 6 – technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- TRL 7 – system prototype demonstration in operational environment
- TRL 8 – system complete and qualified
- TRL 9 – actual system proven in operational environment (competitive manufacturing in the case of key enabling techn

Prototype tests in 2018

Demonstrator tests Apr/May 2020

WP10 Demonstrator



to be tested at KEMA in the end of April 2020

16 kA peak interrupted current against 120 kV TIV in less than 3 ms

Capable of quick O-C-O

Three modules

Inherently bidirectional