

Paris Session 2022



HVDC Grids – The New Era of Transmission

B4 – DC Systems and Power Electronics

PS 1, Q 10

Frank Schettler (Germany)

SIEMENS
ENERGY

Group Discussion Meeting

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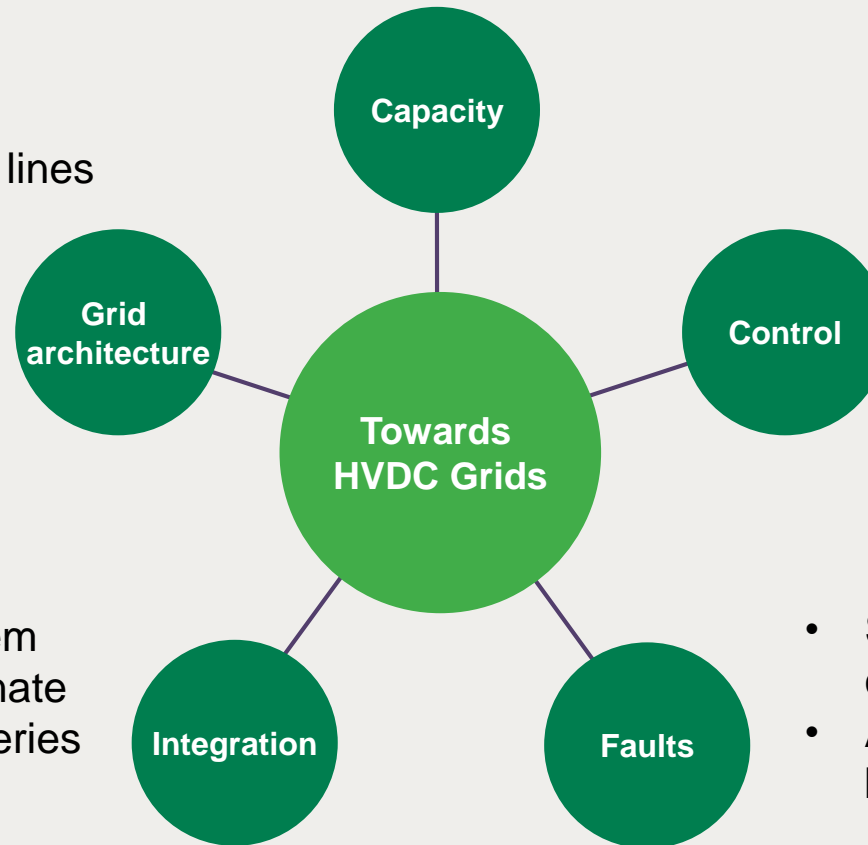
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HVDC Grids – The New Era of Transmission

Changing Paradigms

- Spare transmission capacity and design margins needed for stable and flexible grid operation

- DC switching stations together with transmission lines form the grid
- Converter stations are using the grid



- Core HVDC grid functions are independent of external communication
- A central HVDC grid controller coordinates the high-level control functions

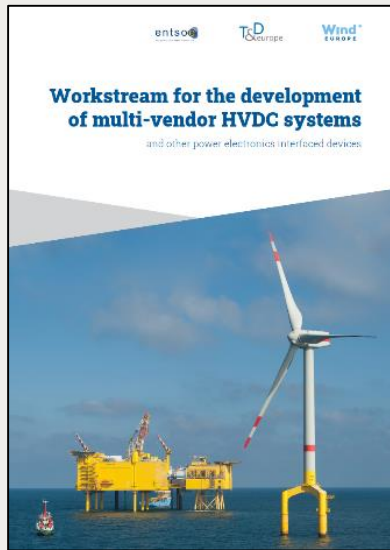
- Experienced system integrators coordinate multi-vendor deliveries

- Selective separation of faulty circuit(s)
- Adequate fault behavior including backup protection

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First Steps in Real Life Projects and International Standardization

Workstream for the development of multi-vendor HVDC systems



Joint publication of ENTSO-E, T&D Europe and WindEurope

Basis for ongoing EU-funded R&D projects

<https://www.tdeurope.eu/component/attachments/attachments.html?id=1767>

HVDC Grid Specification: CLC/TS 50654:2020 „HVDC Grid Systems and connected Converter Stations – Guideline and Parameter Lists for Functional Specifications”

Currently continued at IEC/TC 115/WG 15
IEC TS 63291 CD under review

TECHNICAL SPECIFICATION SPÉCIFICATION TECHNIQUE TECHNISCHE SPEZIFIKATION	CLC/TS 50654-1	TECHNICAL SPECIFICATION SPÉCIFICATION TECHNIQUE TECHNISCHE SPEZIFIKATION	CLC/TS 50654-2
ICS 29.240.01		ICS 29.240.01	
English Version		English Version	
HVDC Grid Systems and connected Converter Stations - Guideline and Parameter Lists for Functional Specifications - Part 1: Guidelines		HVDC Grid Systems and connected Converter Stations - Guideline and Parameter Lists for Functional Specifications - Part 2: Parameter Lists	
To be completed		To be completed	
<small>This Technical Specification was approved by CENELEC on 2018-01-22. CENELEC members are required to announce the existence of this TS in the same way as for an EN and to make the TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force. CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.</small>		<small>This Technical Specification was approved by CENELEC on 2018-01-22. CENELEC members are required to announce the existence of this TS in the same way as for an EN and to make the TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force. CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.</small>	

A joint effort of TSOs, developers, vendors and politics is needed for realization