cigre
For power system expertise

Countermeasures for reduction of high and extreme ice loads by heating of shield wires and phase conductors

B2

PS2, Q. 2.17: Nearly twice the actual average loads would be required for effective heating. If the limiting element is the conductor, is it possible to supplement the simulations using Dynamic line rating?

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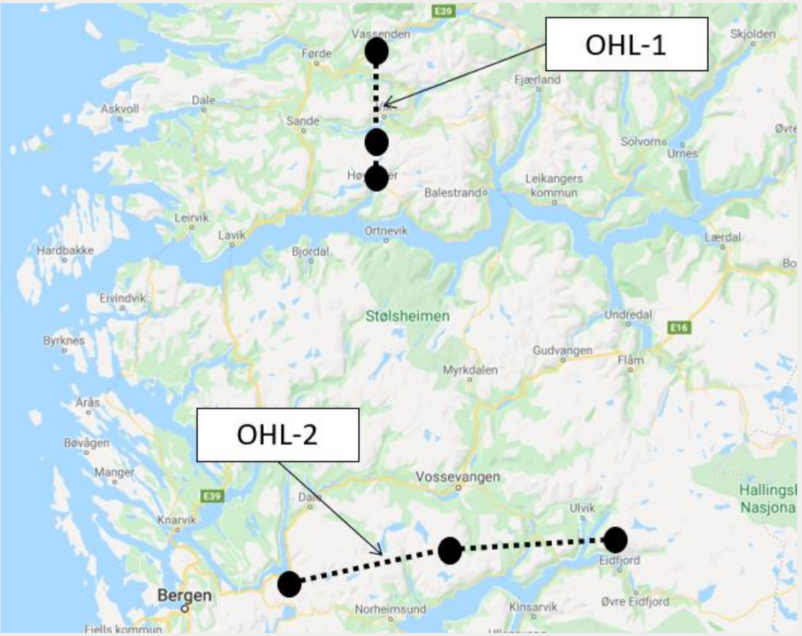
Input in case study: actual design, environmental data, ice loading and operational data for 2 OHLs in Norway.



Parameters	OHL-1	OHL-2
Period of data collection	2015-2018	2013-2018
Average load current (A) with the line in or out of operation	157	165
Average load current, line in operation (A)	217	208
Maximum current (A)	1120	1282
Average current in operation and ambient temp. <0 °C *	242/250/272	213/213/236

* Values corresponded to temperatures at the three positions along the line route

Results of case study

- Load current about 500 A will prevent ice loads in 90% of cases (HTLS)
- The thermal capacity of the OHL allows for such currents
- However, this is twice the actual average load current
- Potentially promising solution is to combine re-distribution of currents in the bundle with increased current obtained by intentional short circuiting of the line at the remote end, possibly via a transformer.

Percentage of prevented ice accretion	Required power for iced areas (kW/km)		Required current for iced areas (A)	
	OHL-1	OHL-2	OHL-1	OHL-2
10%	3	4	146	174
30%	7	9	232	267
50%	12	15	301	332
70%	16	21	350	400
90%	27	32	452	495
99%	42	51	562	619