

# SEERC TM CAVTAT MAY 2024

*THE PEOPLE OF CIGRE*

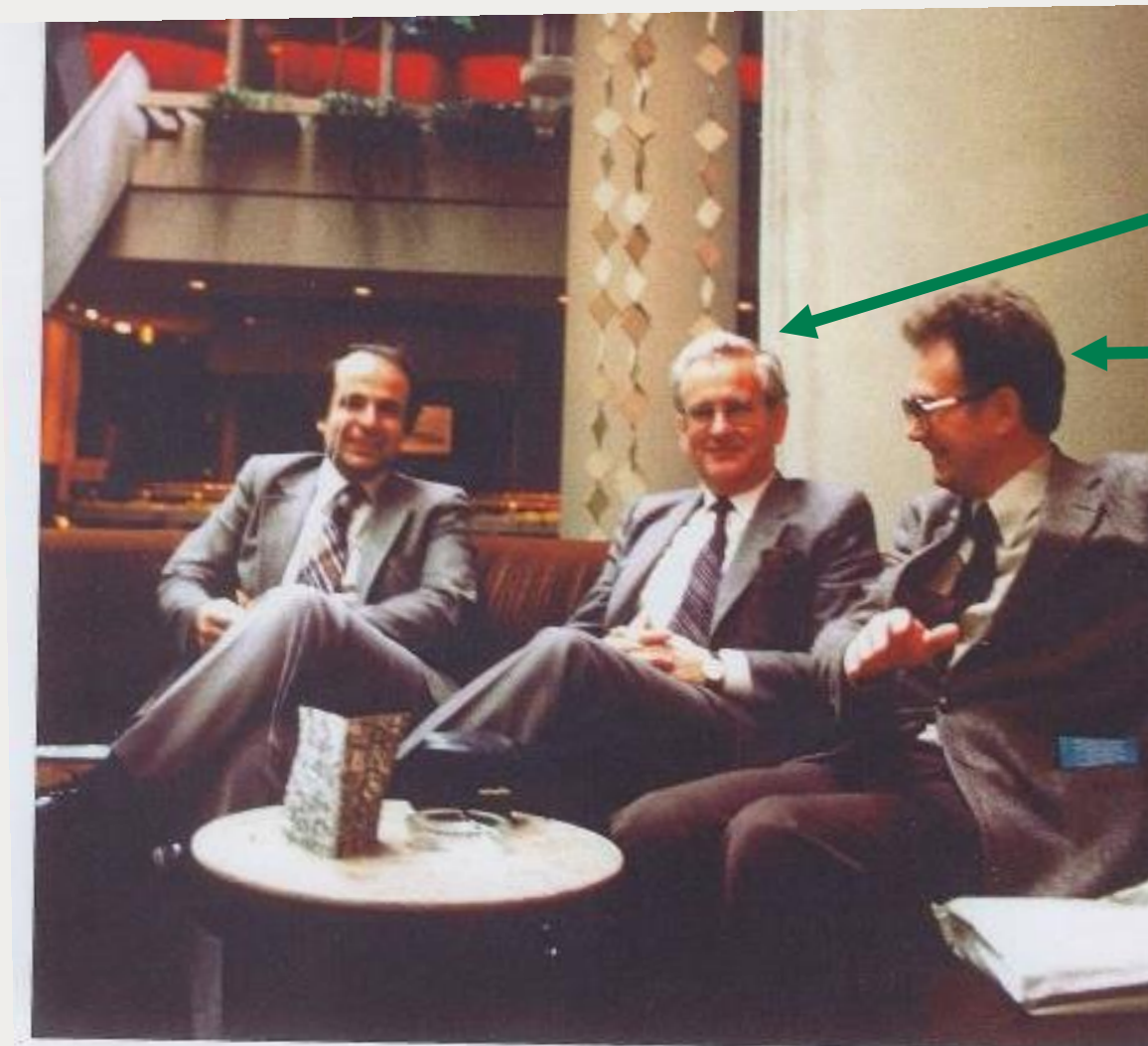
KONSTANTIN O. PAPAILIOU

# WHO IS WHO



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# WHO ARE THESE?



Dr. Walter Bückner

Prof. Dr. Rolf Helms

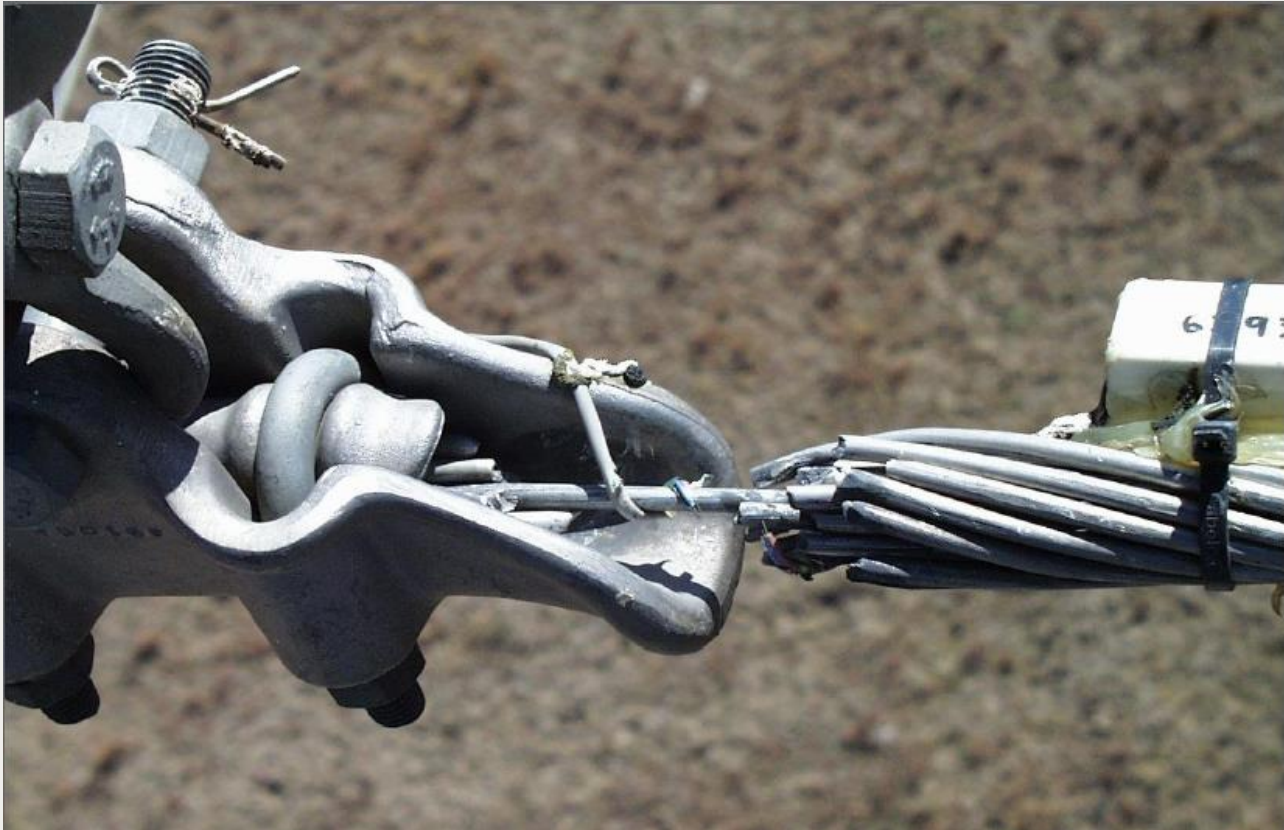
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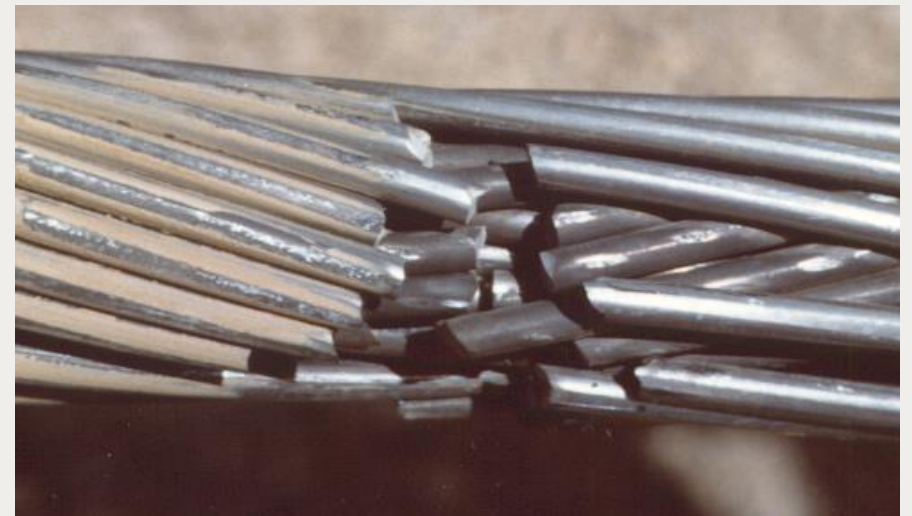
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# AEOLIAN VIBRATIONS



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# RECOMMENDATIONS FOR THE LIFETIME OF TRANSMISSION LINE CONDUCTORS

N° 63

ELECTRA

103



Walter Bückner

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RECOMMANDATIONS POUR L'EVALUATION DE LA LONGEVITE DES CONDUCTEURS DE LIGNES DE TRANSPORT AERIENNES

par le Groupe de Travail 04  
du Comité d'Etudes N° 22  
(Lignes aériennes)

Chef de File : Walter Bückner

Rapport publié à la demande  
du Président du Comité :  
M.V. Bourgsdorf

RECOMMENDATIONS FOR THE EVALUATION OF THE LIFETIME OF TRANSMISSION LINE CONDUCTORS

by Working Group 04  
of Study Committee No. 22  
(Overhead Lines)

Convenor : Walter Bückner

Paper published at the request  
of the Chairman of the Committee  
Mr. V. Bourgsdorf



Philip Dulhunty

Miner formula:

$$D = \sum_1^i \frac{n_i}{N_i}$$

# THE POFFENBERGER-SWART FORMULA

Jim Poffenberger



$$\sigma_b = \frac{E_a d_a p^2}{4(e^{-px} - 1 + px)} Y_b$$

## CONDUCTOR FATIGUE TESTS

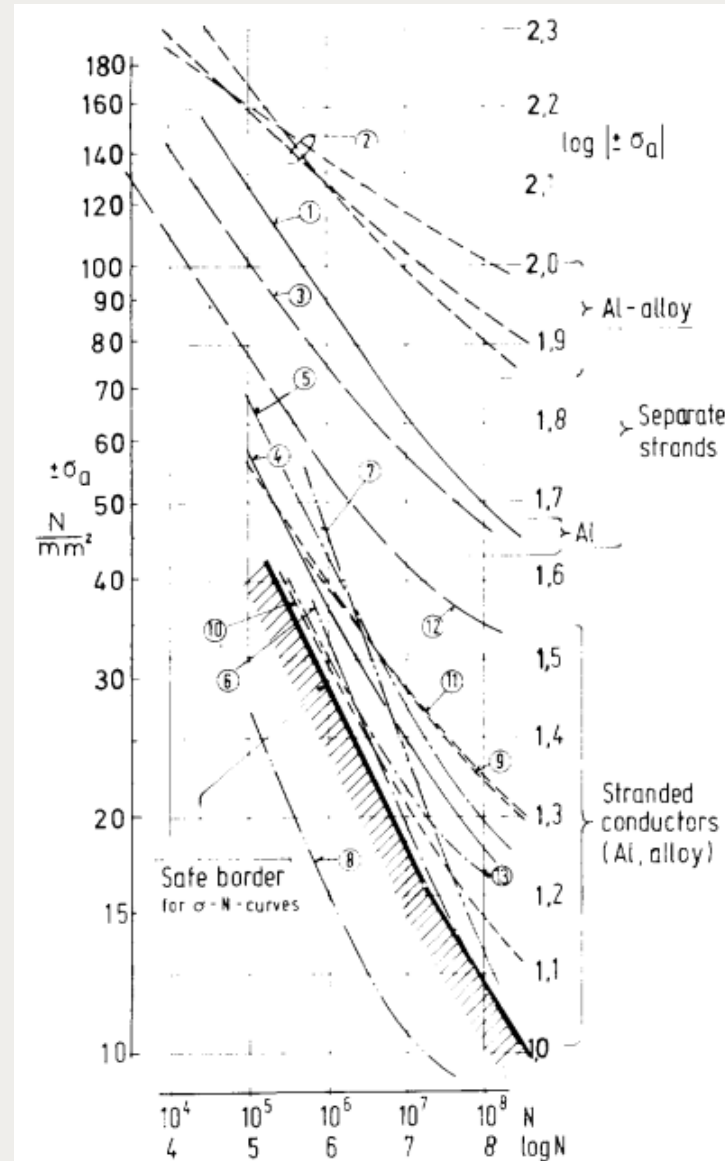
Louis Cloutier



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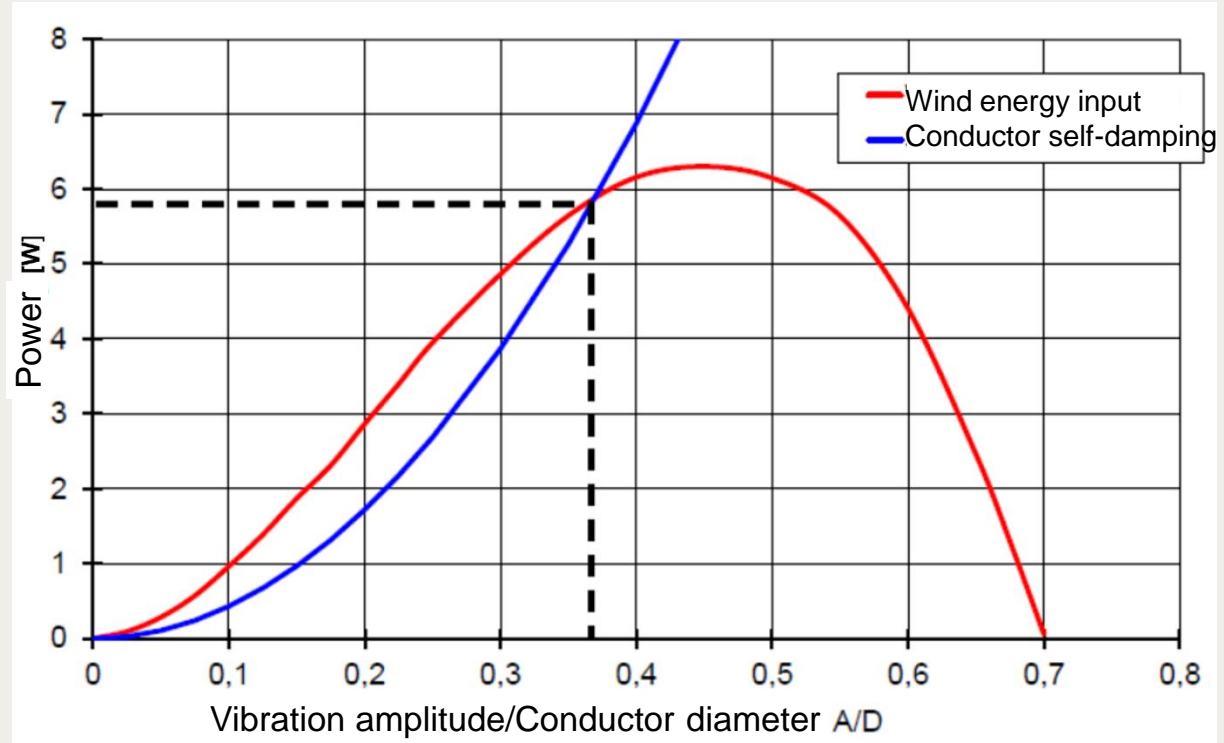


Chuck Rawlins



# ENERGY BALANCE PRINCIPLE

Magnar Ervik



## Report on aeolian vibration

ELECTRA

N° 124 1989

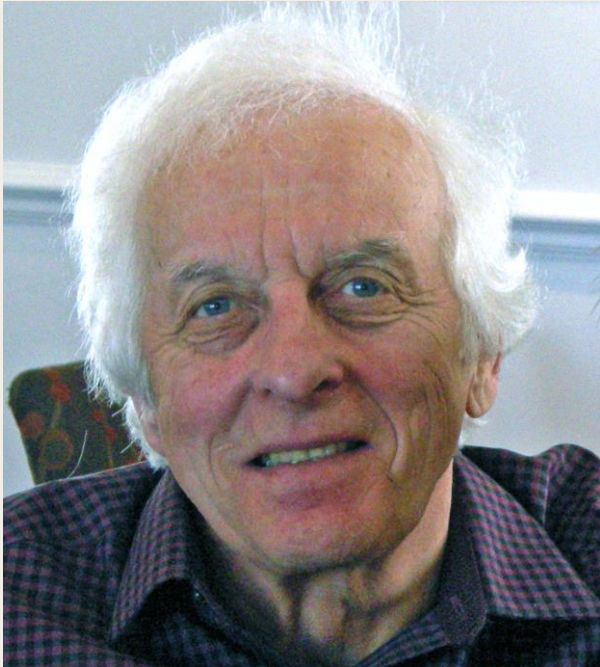
Working Group 01 of Study Committee 22 (Overhead lines)

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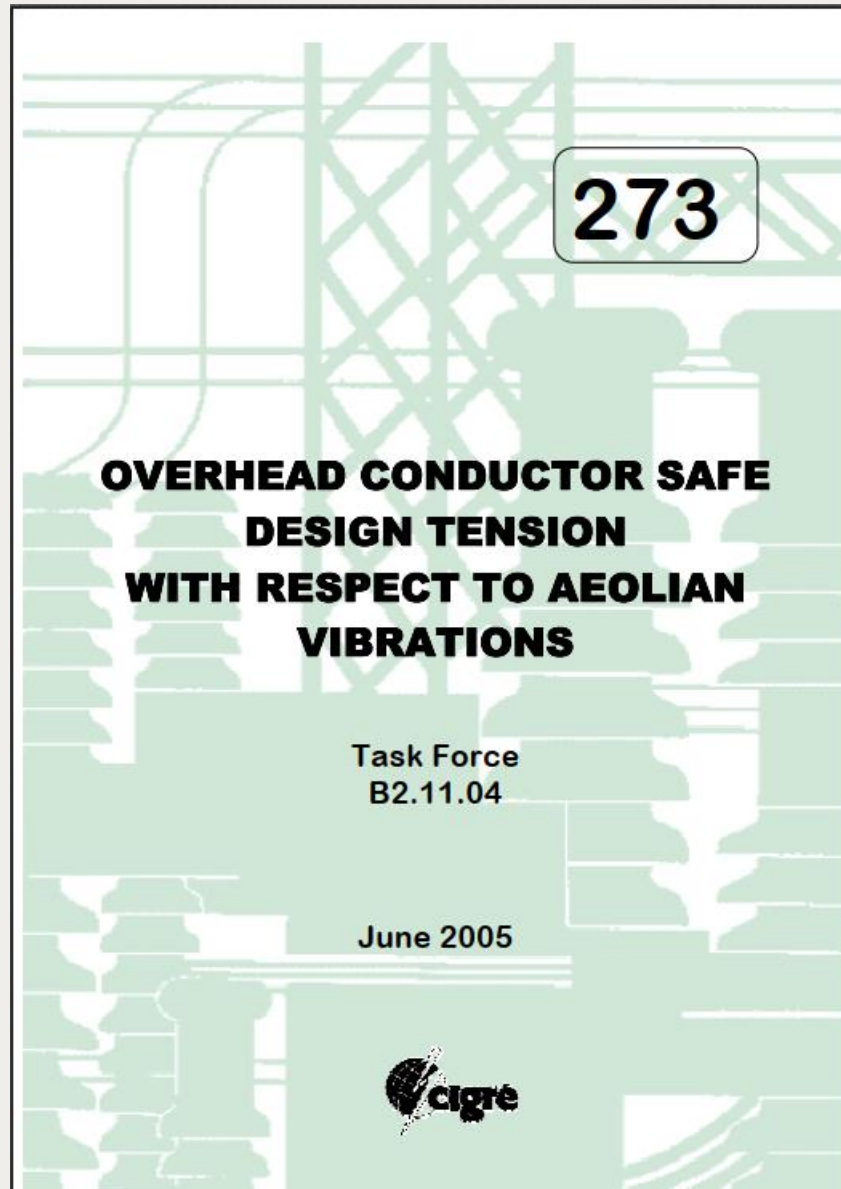


# CIGRE TB 273

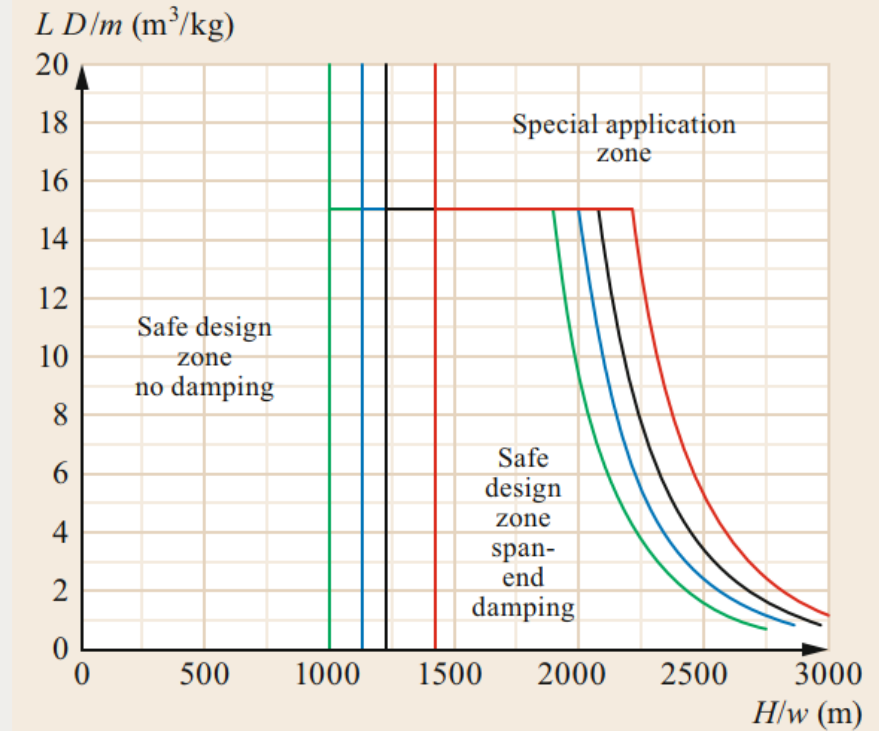
Claude Hardy



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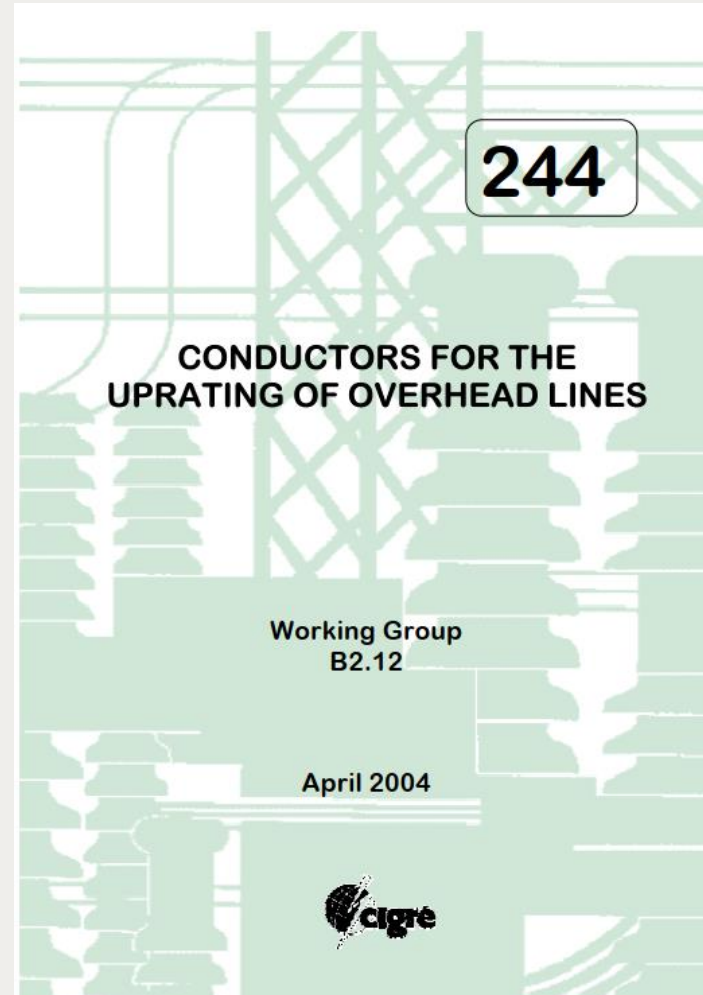


# CONDUCTORS FOR THE UPRATING OF OHL

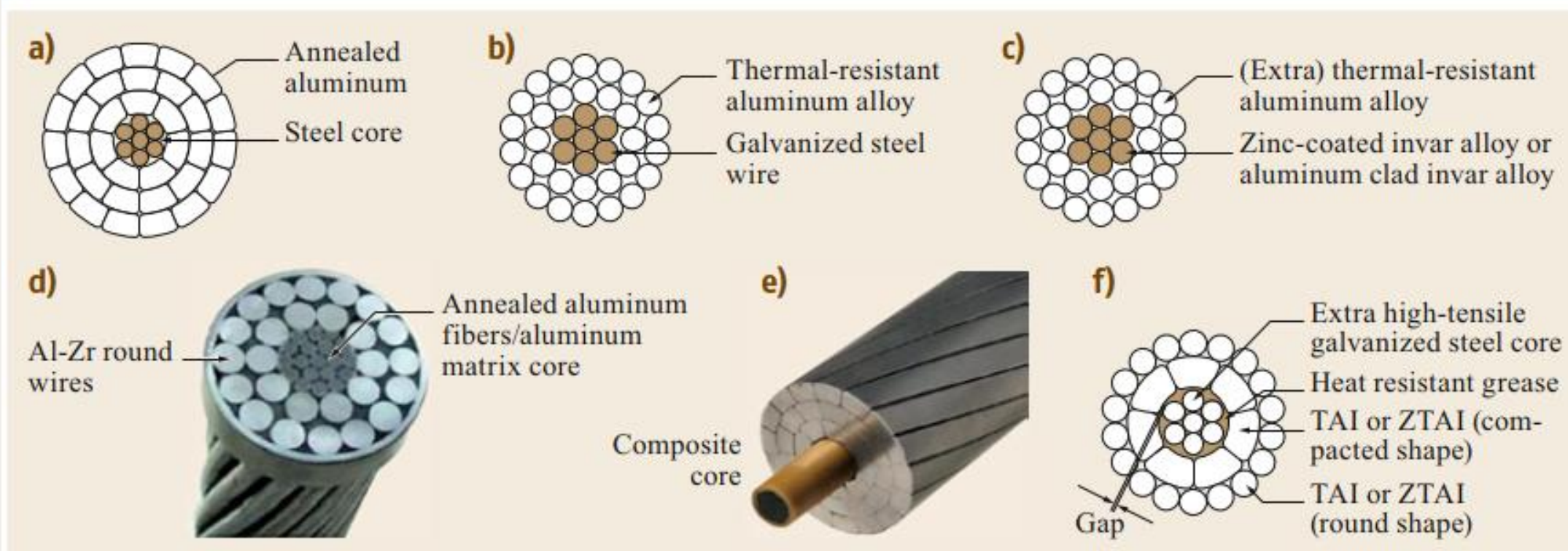


**Dale Douglass**

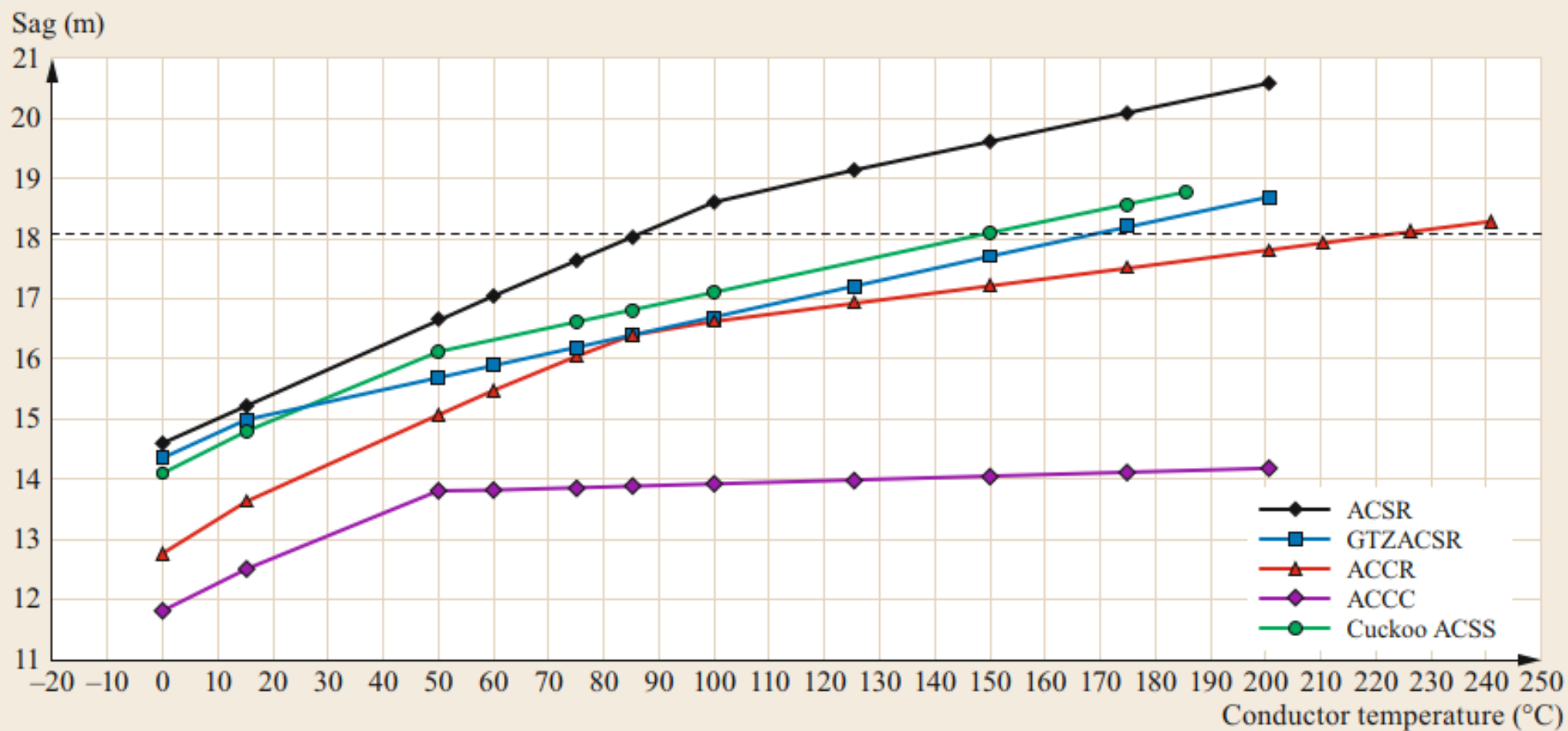
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# HTLS CONDUCTORS



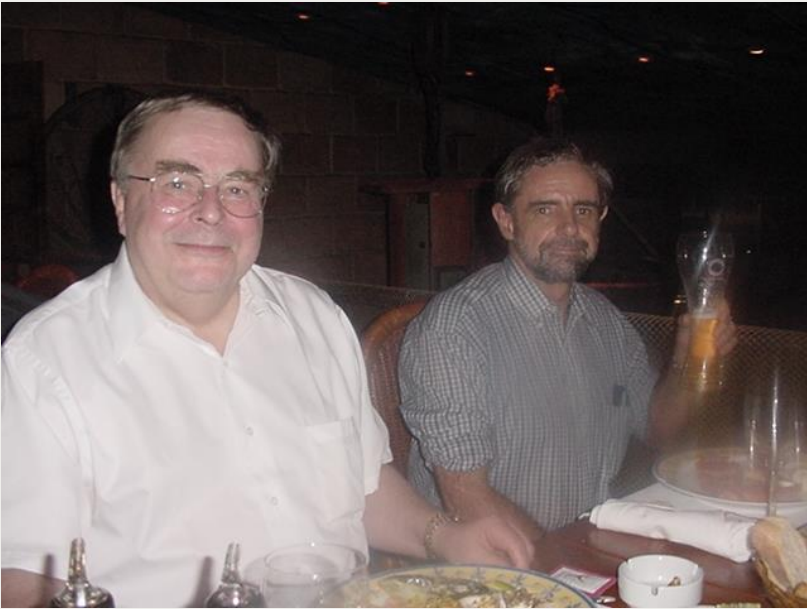
# SAG BENEFITS OF HTLS CONDUCTORS



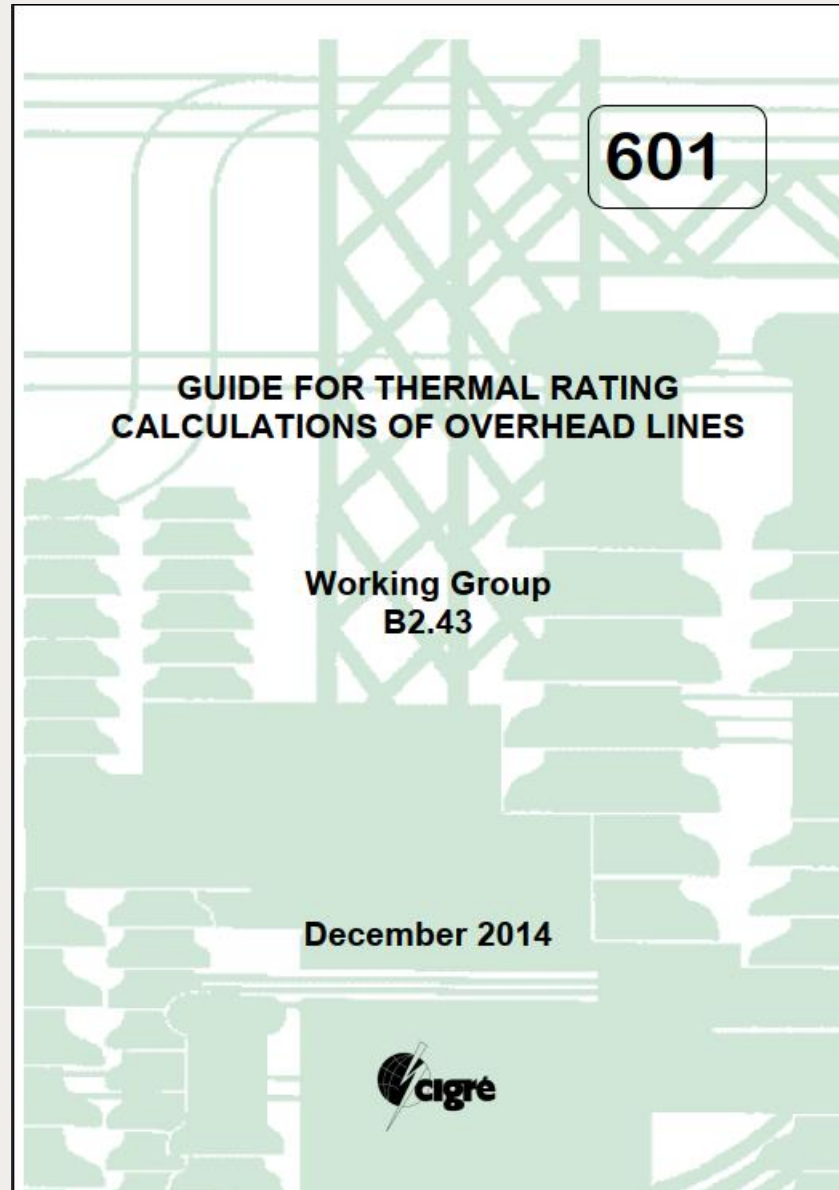
S

# REAL TIME MONITORING

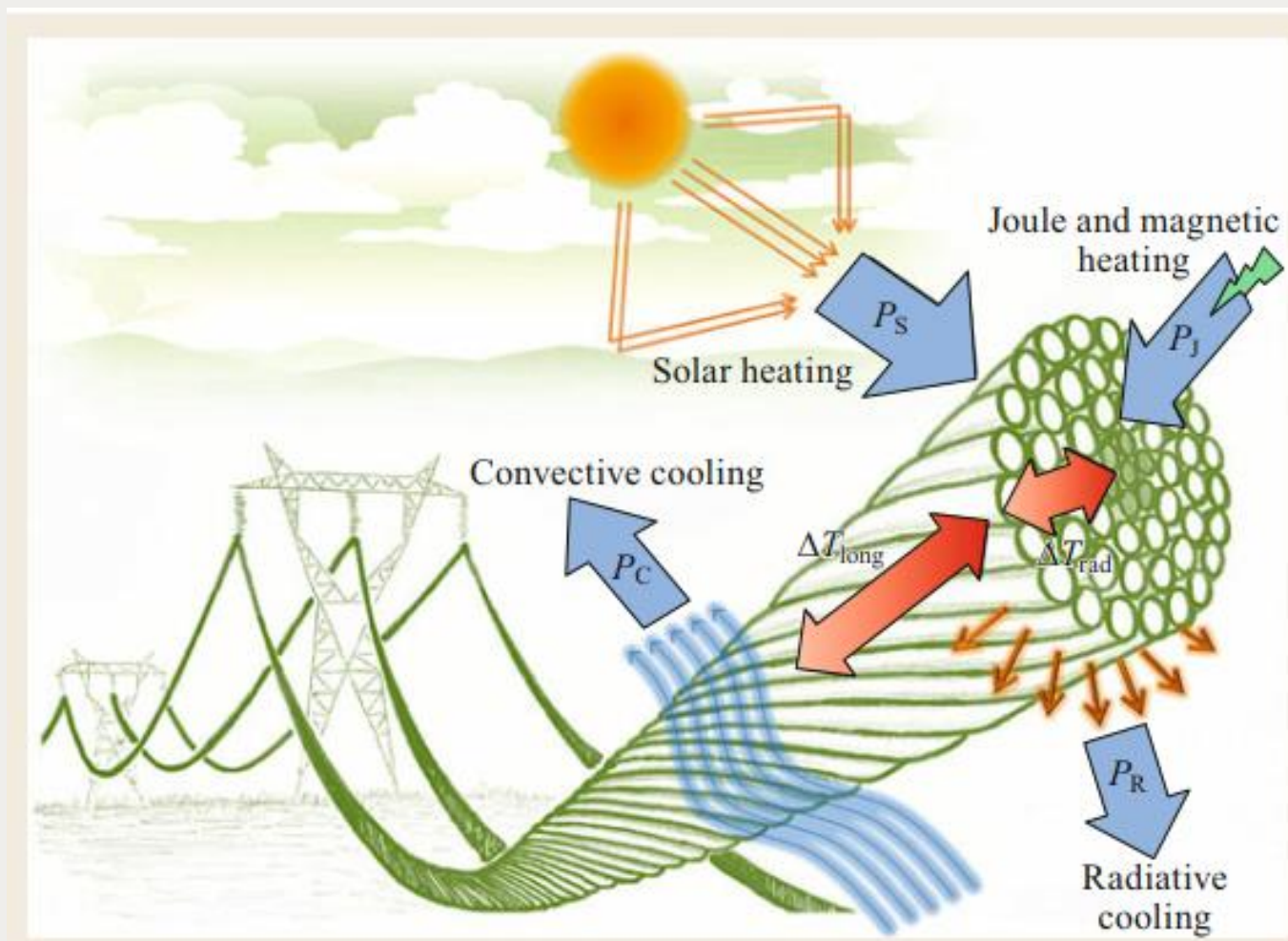
Tap Seppä



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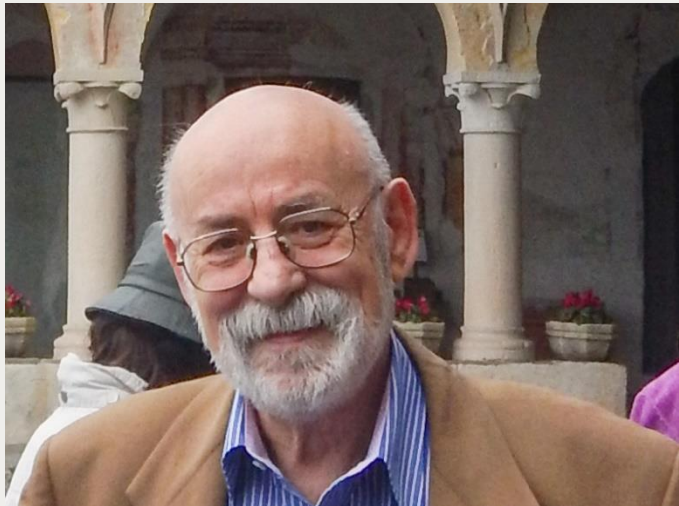


# HEAT BALANCE EQUATION

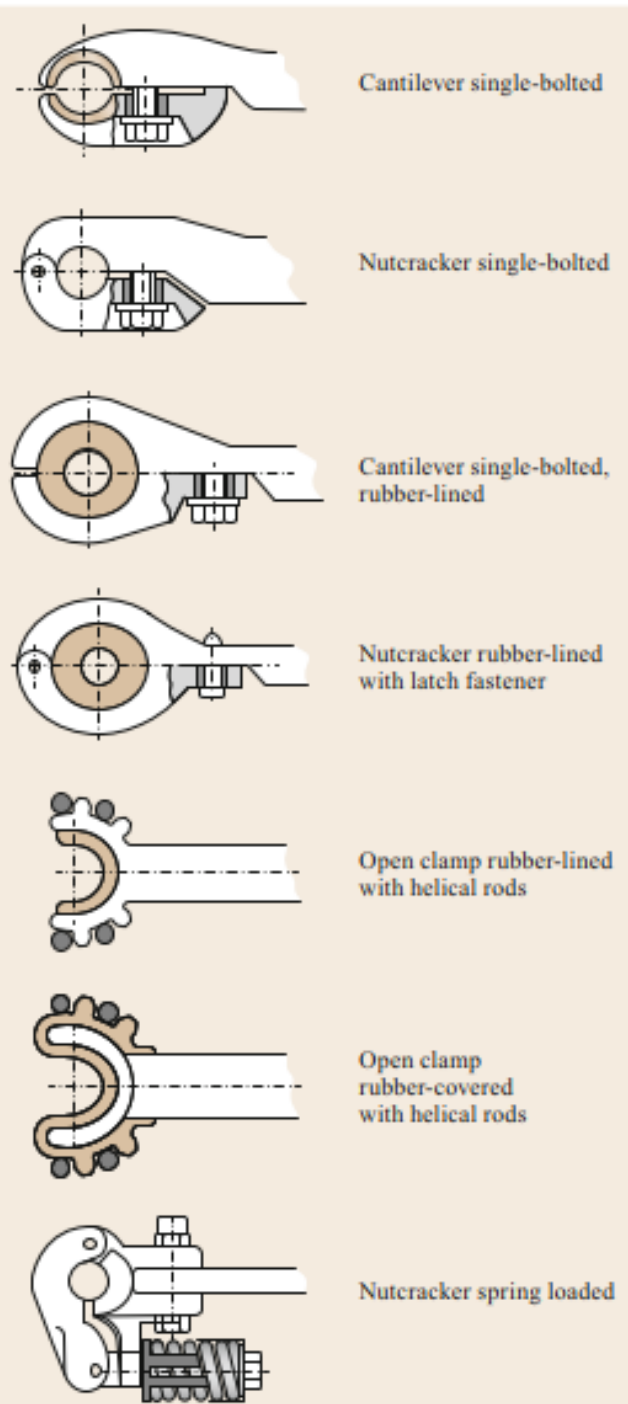


# THE ALLROUNDER

Umberto Cosmai



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# COMPOSITE INSULATORS

Claude de Toureil



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Power Systems

Konstantin O. Papailiou  
Frank Schmuck

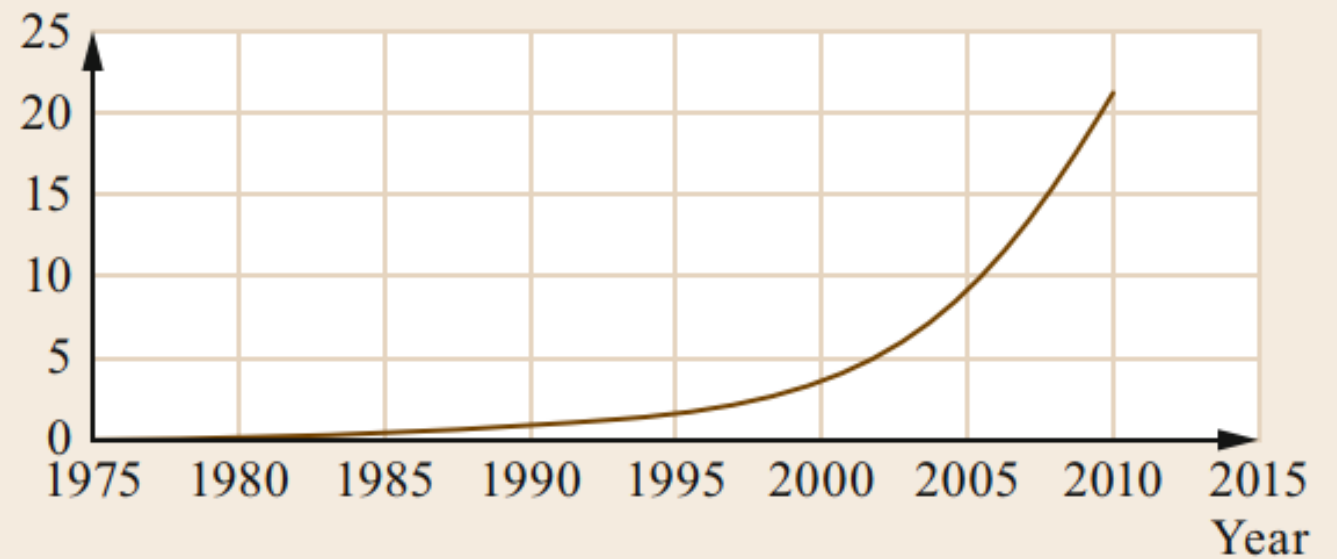
# Silicone Composite Insulators

Materials, Design, Applications

PFISTERER

 Springer

Million units



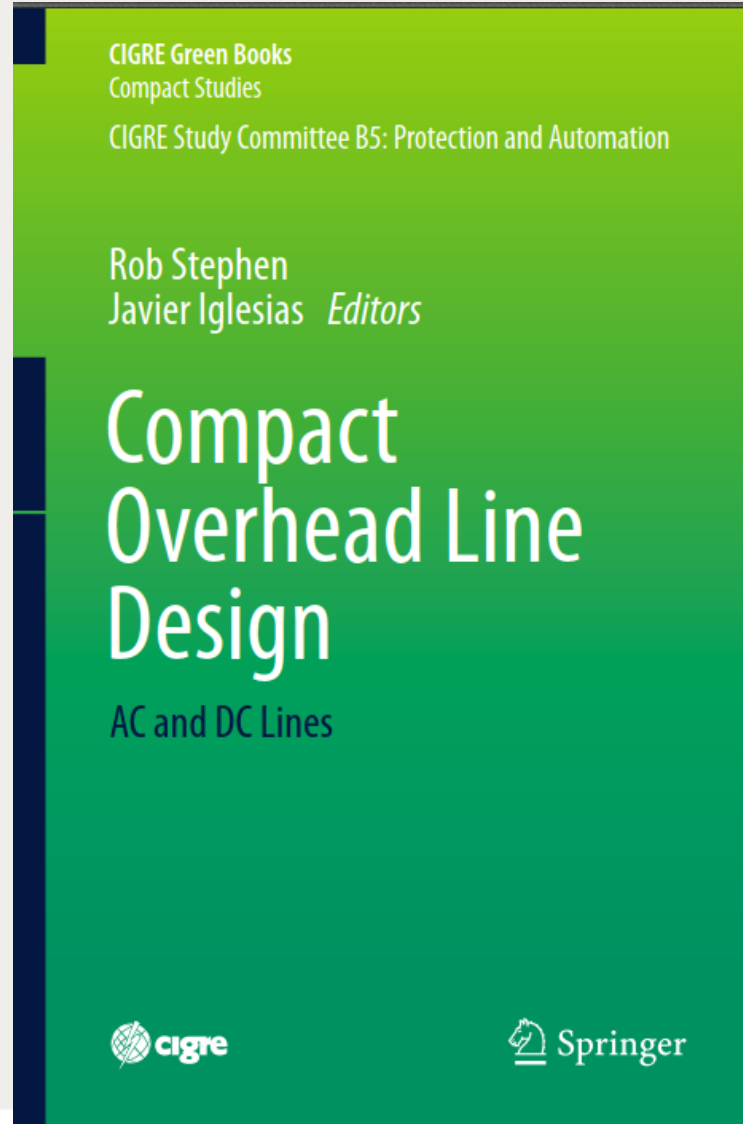
# INSULATED CROSS-ARMS



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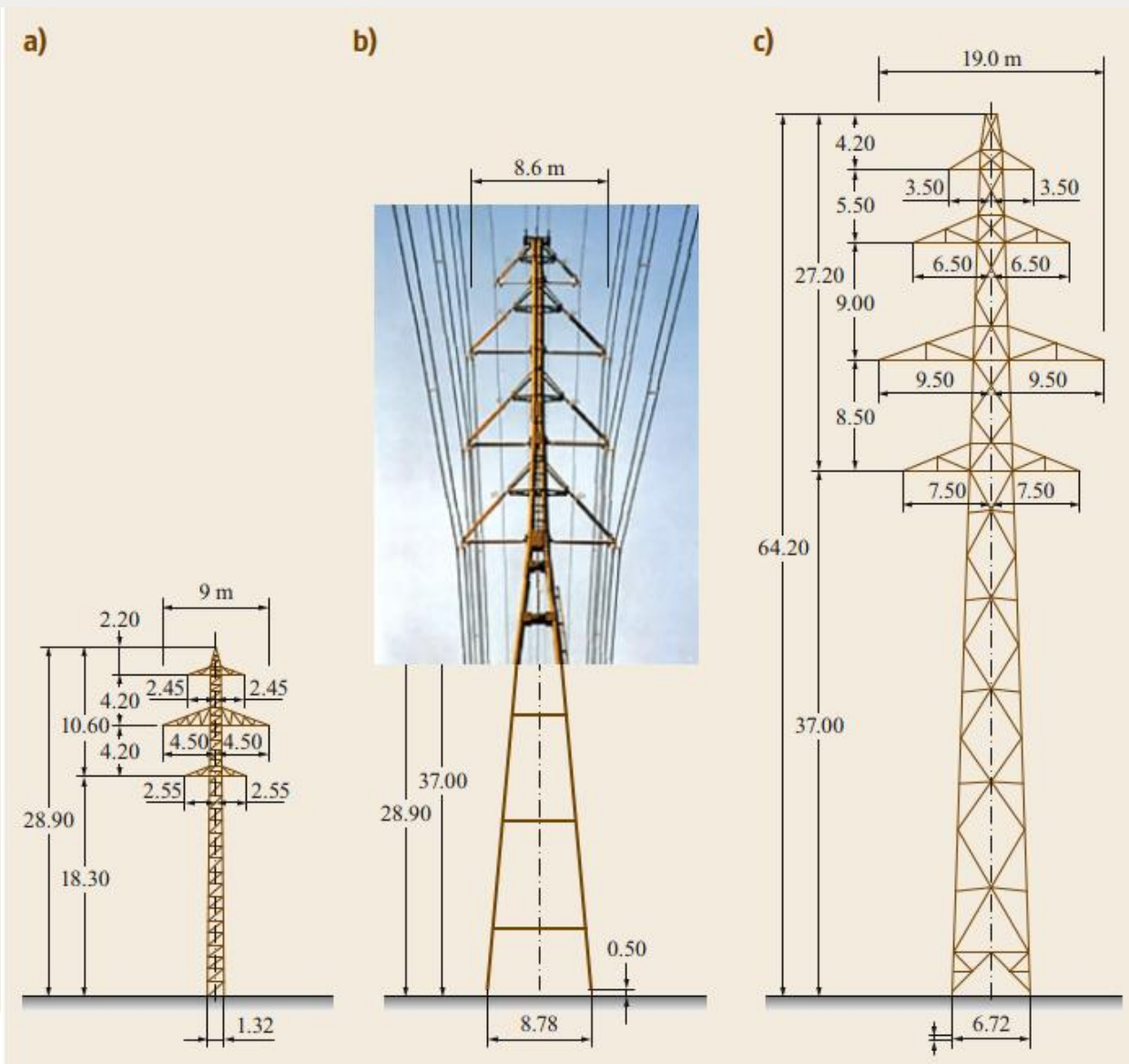
- High bending strength
- Elastic limit in the region of ultimate strength
- High ultimate strain
- Not brittle

# CIGRE GREEN BOOK OF COMPACT LINES

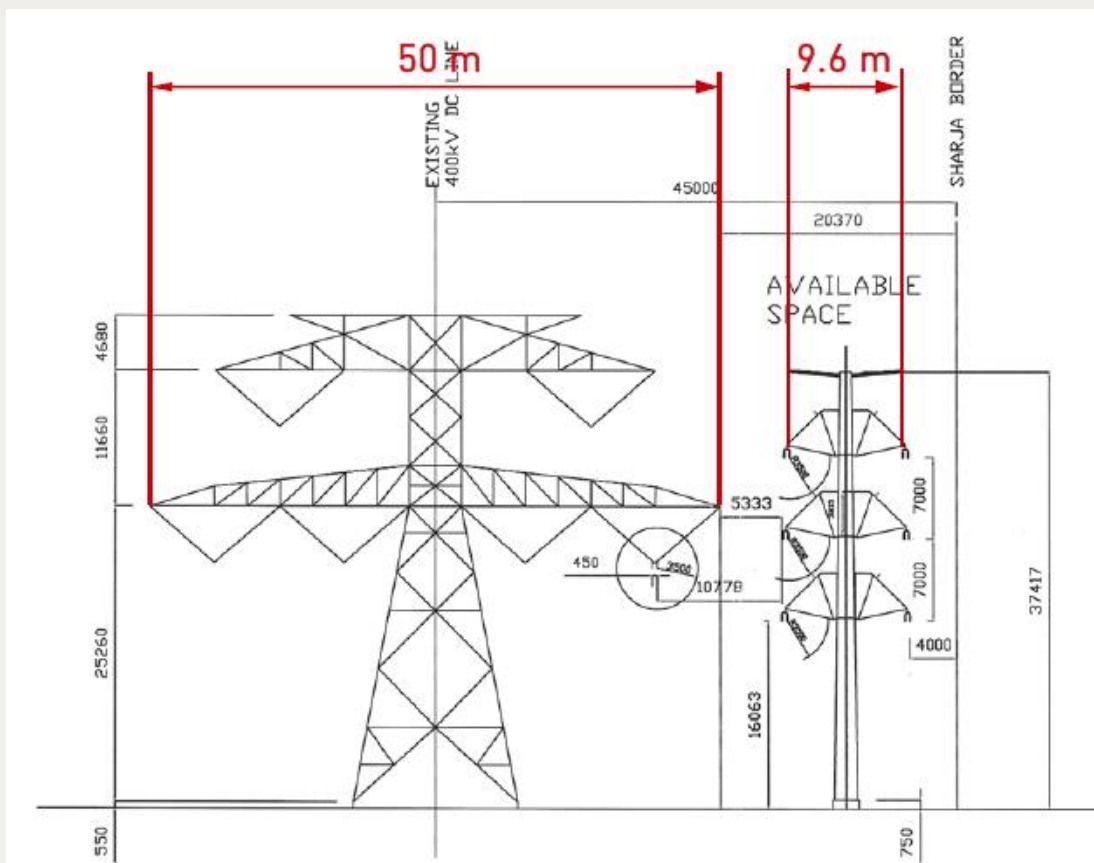


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# FIRST 400 kV COMPACT LINE (1998, CH)



# COMPARISON CLASSICAL VS. COMPACT



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# REPLACEMENT OF A 150 kV BY A 380 kV LINE IN BELGIUM



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# WINTRACK LINE IN HOLLAND



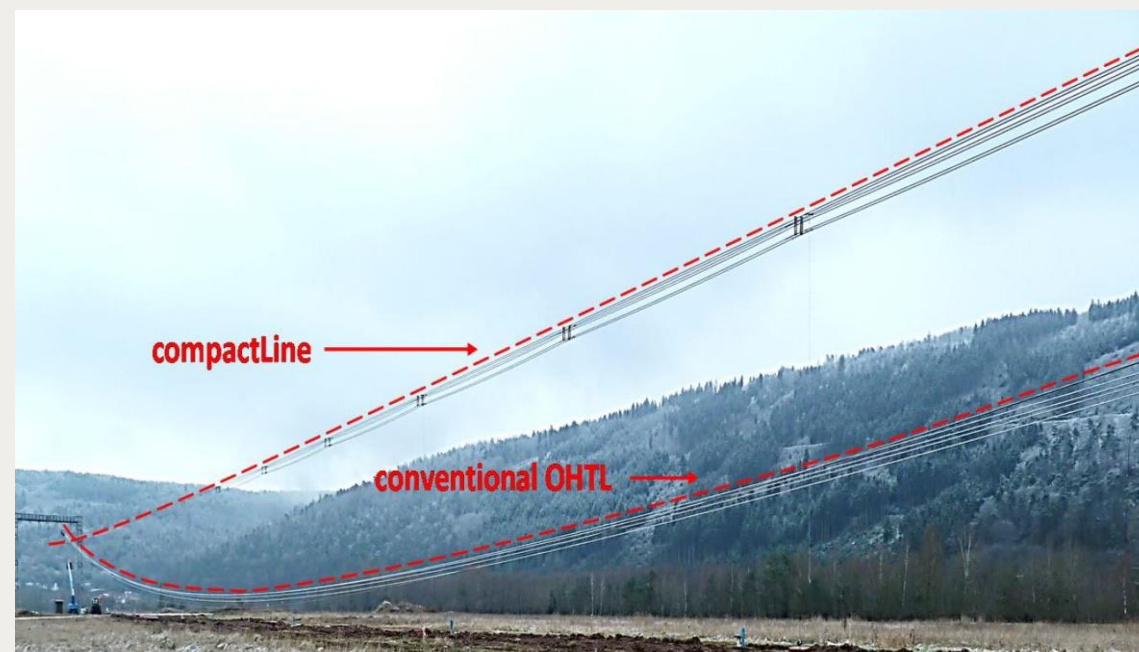
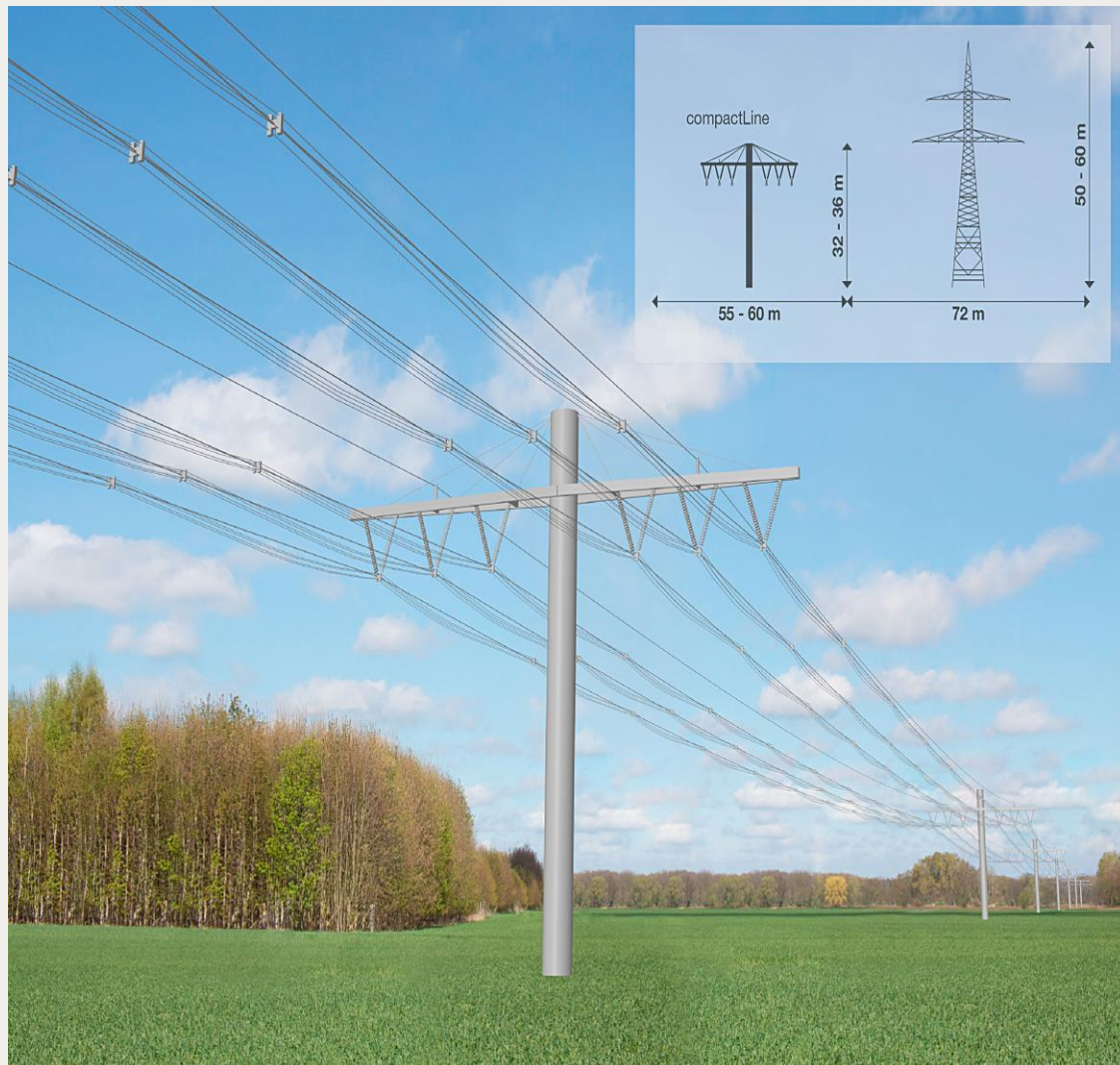
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# UPRATING FROM 245 kV TO 400 kV IN AUSTRIA





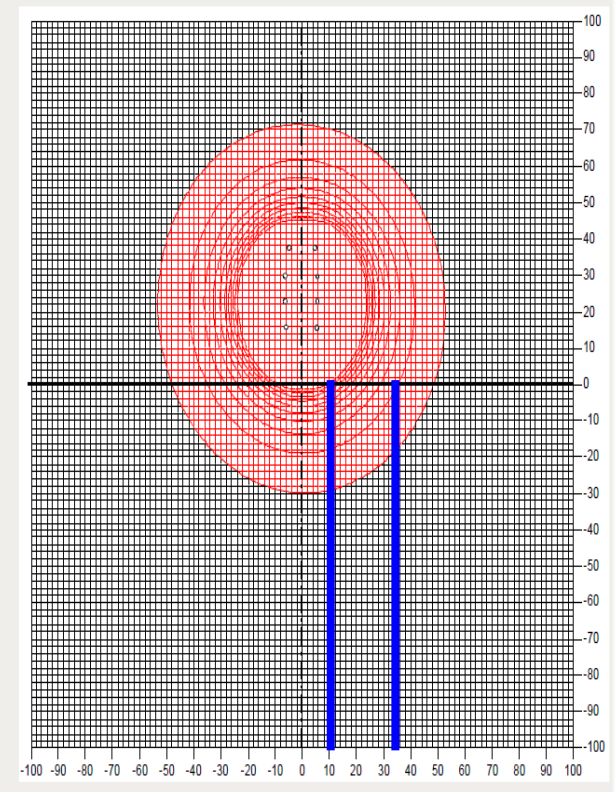
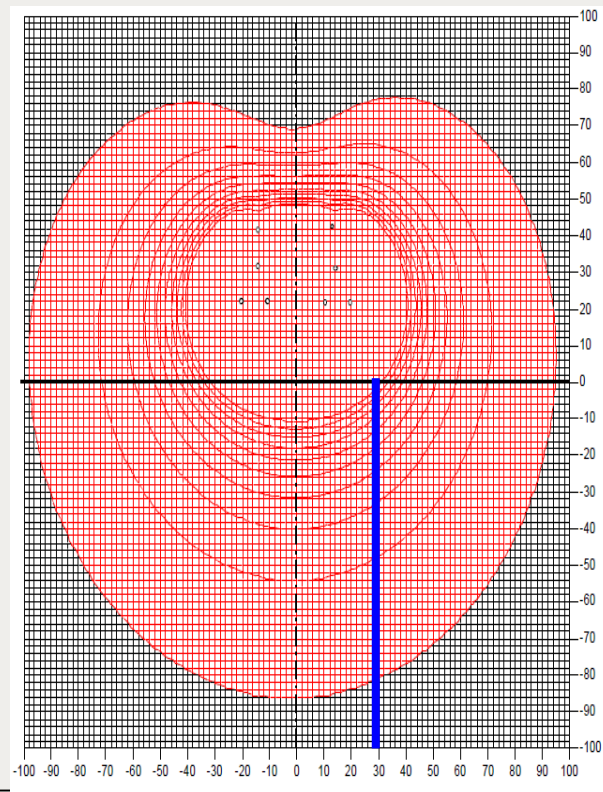
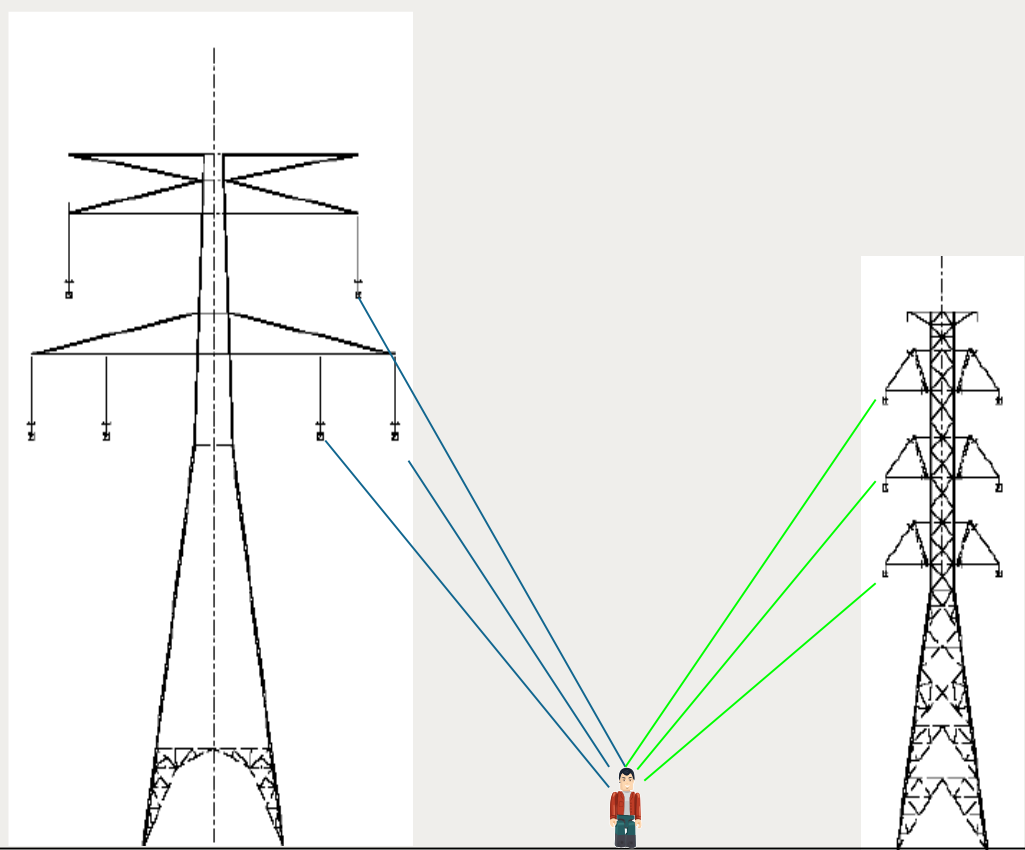
# COMPACTLINE IN GERMANY



# OHL 35 (110) kV Raša - Koromačno



# COMPACT LINES REDUCE EMF



## COMPACT LINES INCREASE SIL BY 10% - 15%

$$\uparrow P_{nat} = \frac{U_{pp}^2}{Z}$$

$$\downarrow Z = \sqrt{\frac{L}{C}}$$

$$\uparrow C' = \frac{2\pi\epsilon_0}{\ln \frac{D_m}{r_B \sqrt{1 + (D_m / 2h_m)^2}}}$$

$\downarrow D_m$ : average phase distance

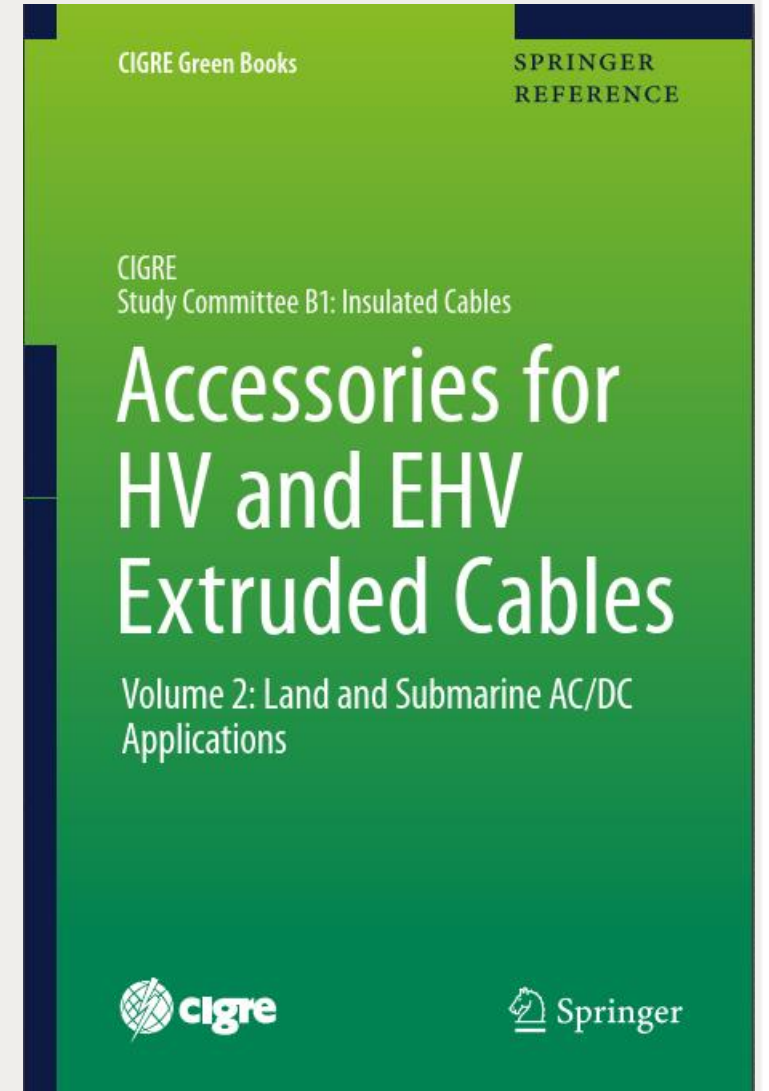
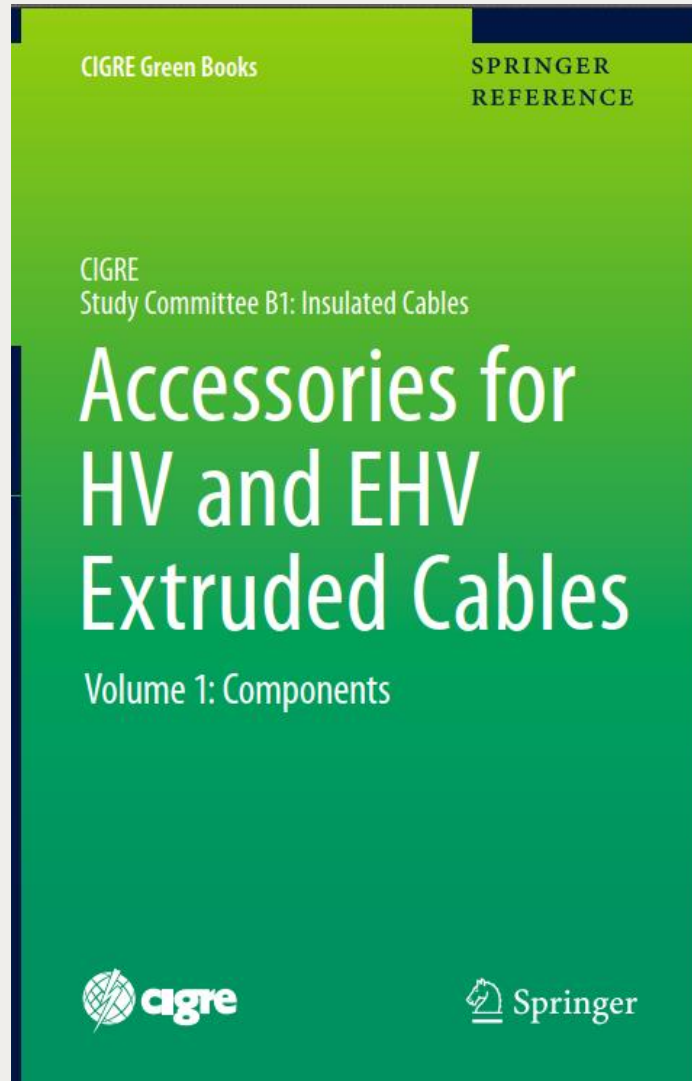
$\uparrow r_B$ : equivalent bundle radius

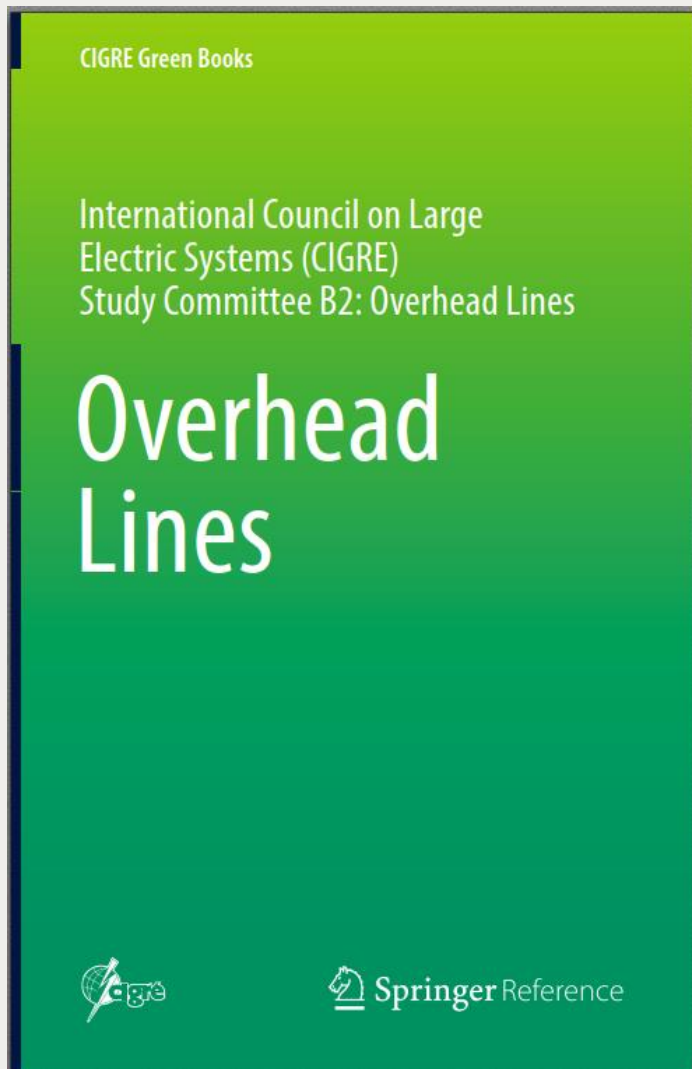
$\uparrow h_m$ : average ground clearance

# PIERRE ARGAUT AND UNDERGROUND CABLES



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