

Experiences with certification process and certified model validation in Germany

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Moeller Operating Engineering GmbH

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Agenda



1. Presentation of M.O.E

- a) Jochen Möller
- b) Competences; Accreditations; capacity; Organisation

2. Current Situation in Germany

- a) Rate of RE
- b) Requirement of certification
- c) Processes of certification

3. LVRT Test and Certification

- a) Required Test
- b) Model validation

4. Project certification

- a) Process
- b) Target

5. Summary

Speaker

Dipl.-Ing. Jochen Möller

Past :

Technical Director WINDTEST

Several International Standards WG

Nowadays:

Convener FGW TC Electrical behaviour
and WG-Leader for Certification

Publicly appointed and authorized by
the chamber of industry and commerce

Managing director and owner of M.O.E.

Head of Certification body GGC



Study: E-Technical

From 1993 Wind&Grid

Expert for Grid integration



MOE: SDL Wind Jochen Möller

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Location of M.O.E.

- Itzehoe Fraunhoferstraße 3, seit 11/2009
- Hamburg, Spaldingstraße 210, ab 05/2011
- Kiel, Am Kielkanal 2, ab 06/2011



MOE: Technische Richtlinien Jochen Möller

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What is M.O.E. doing?

Grid connection/grid integration

- Certification, reports SDL and Grid code compliance
- Wind and sun and others

Target Grid integration of RE without reduction of availability of the power supply

MOE: SDL Equipment Jochen Möller



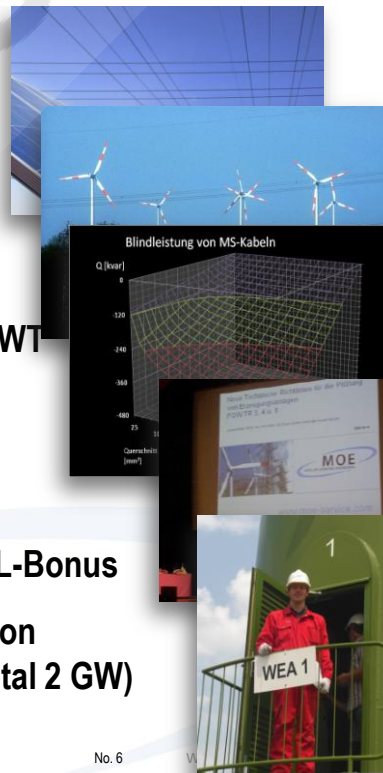
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GridCert References last two years M.O.E.

- 12/2010: Inspection of 1500 existing WT (3 GW)
- 04/2011: 15 type certification (PV and Wind)
- 04/2011: >40 project certification SDL-Bonus
- Until 12/2011: >200 project certification already contracted wind and sun (total 2 GW)

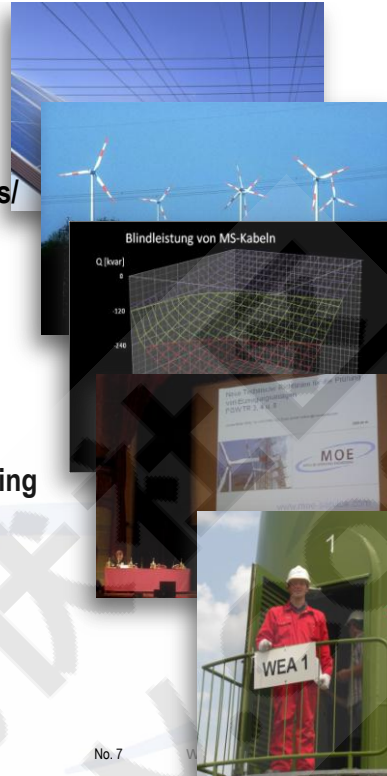
M.O.E.: Jochen Moeller ©



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Competence M.O.E.

- **Frame Contracts with the largest Owners/ Developers** e.g. WPD, Ostwind, WKN
- **First Certification body with acc.** EN45011 and FGW TR8
- **First general acceptance by the grid operator association and FGW**
- **Convener/Chairman for the German testing and certification guideline**



M.O.E.: Jochen Moeller ©

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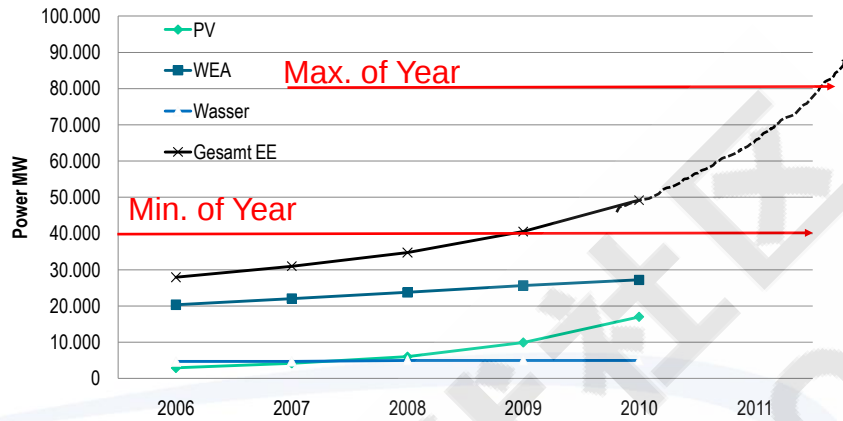
M.O.E: SDL Wind Jochen Möller ©

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RE in Germany

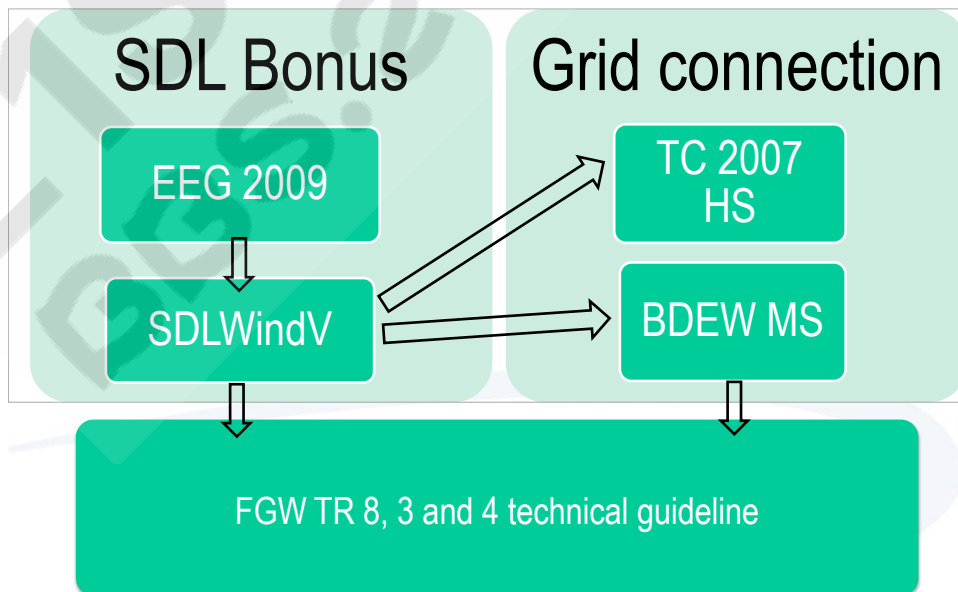
RE installed in Germany



Quelle: Entwicklung der erneuerbaren
Energien in Deutschland im Jahr 2010
Grafiken und Tabellen
BMU Stand: 14. März 2011

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Rights and Requirements

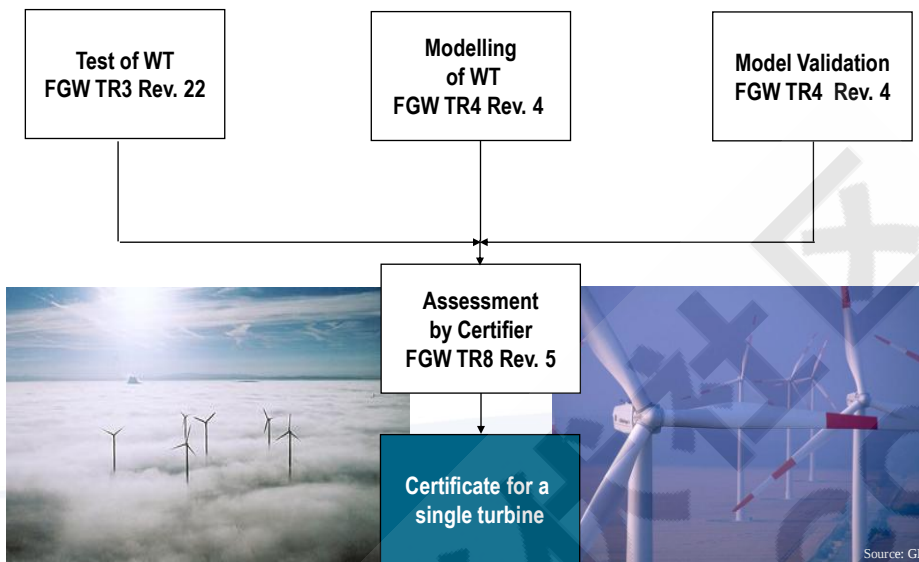


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1 Type test acc. BDEW/EEG

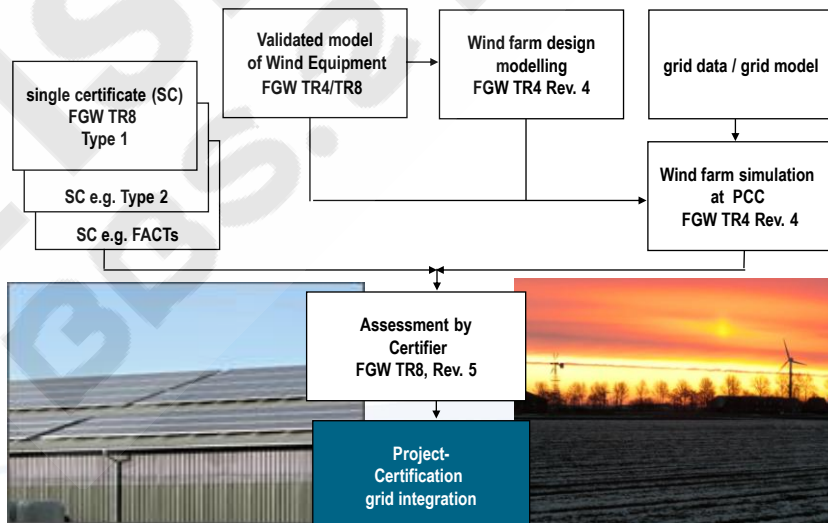


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Project acc. BDEW/EEG



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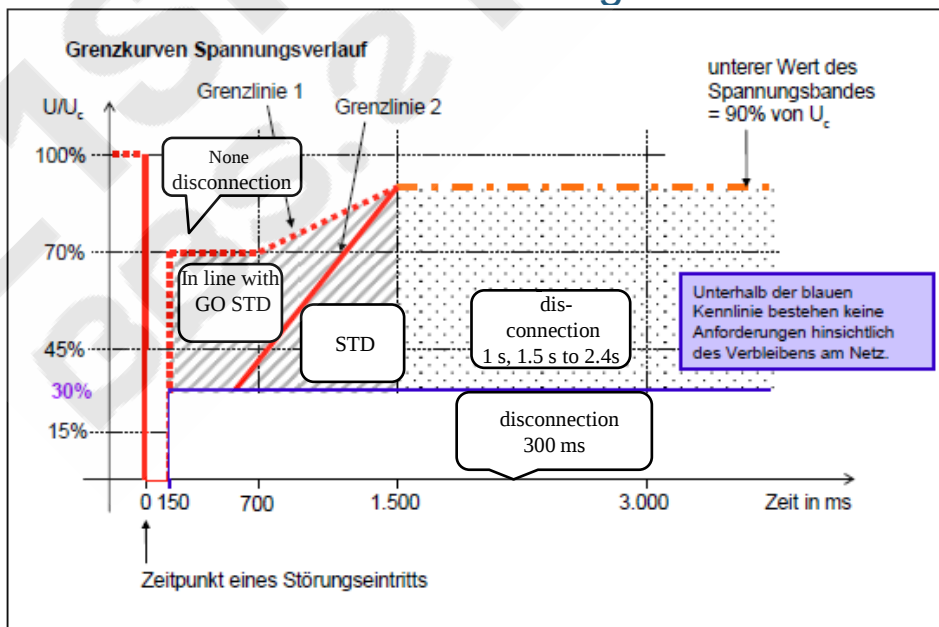
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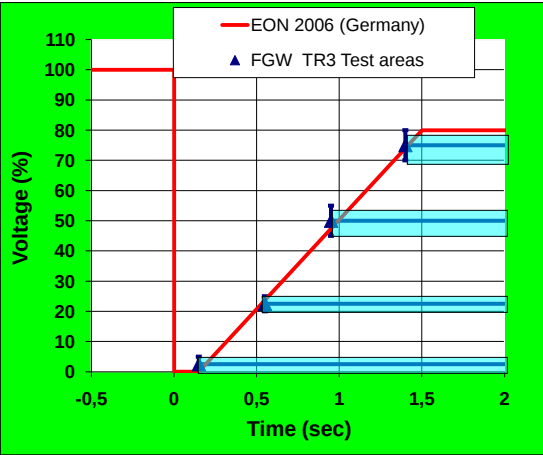
BDEW MV Level for RE generator



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Voltage dip test

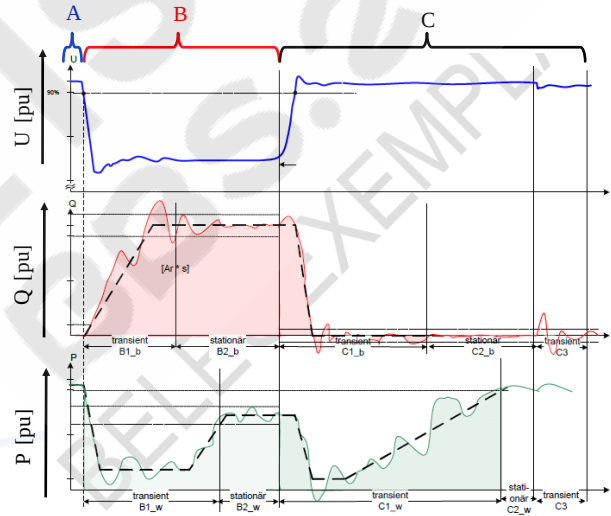
Two- /three phase
Part and full load

	Phase to phase Voltage (U/U_0)	period (ms)
	≤ 0.05	≥ 150
2	0.20 – 0.25	≥ 550
3	0.45 – 0.55	≥ 950
4	0.70 – 0.80	≥ 1400

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Time Area FGW TR4



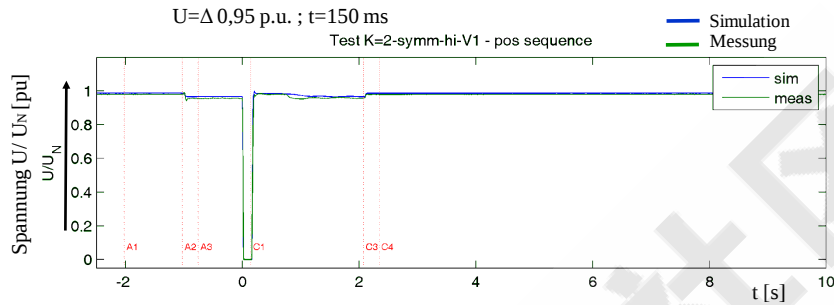
Time Zone:
A: bevor fault (10%)
B: dip (60%)
C: after fault Clearing (30%)

Quelle: FGW TR4 Rev.5

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Example of model validation model

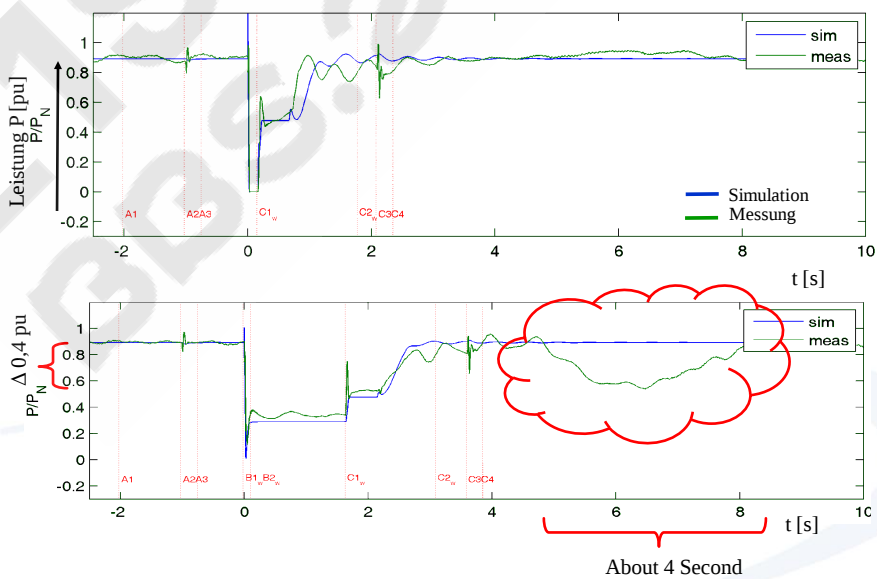


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Example of model validation model

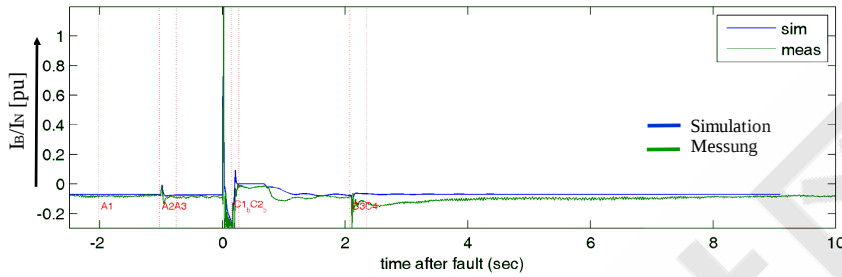


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Beispiel: Modellvalidierung

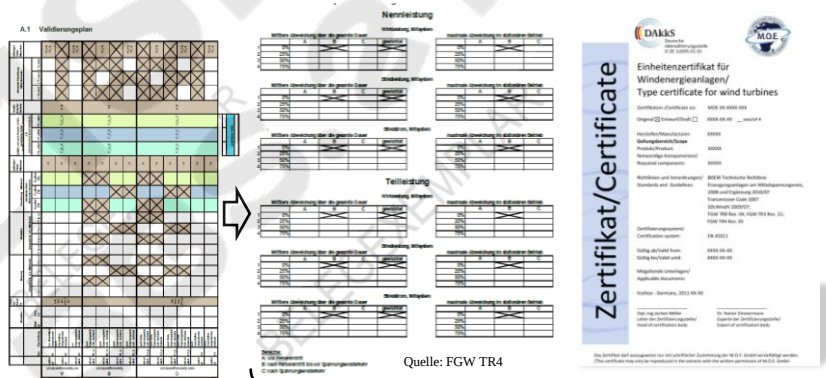


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Certification of type Models



Quelle: FGW TR4

Validation plan by
Certification body

Over view plan

Manufacturer:

•Unit certification and model with md5-number

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Experiences of type certification

- Need around 9 months
- 3 iteration of model design: Before the model fit the requirement according TR4



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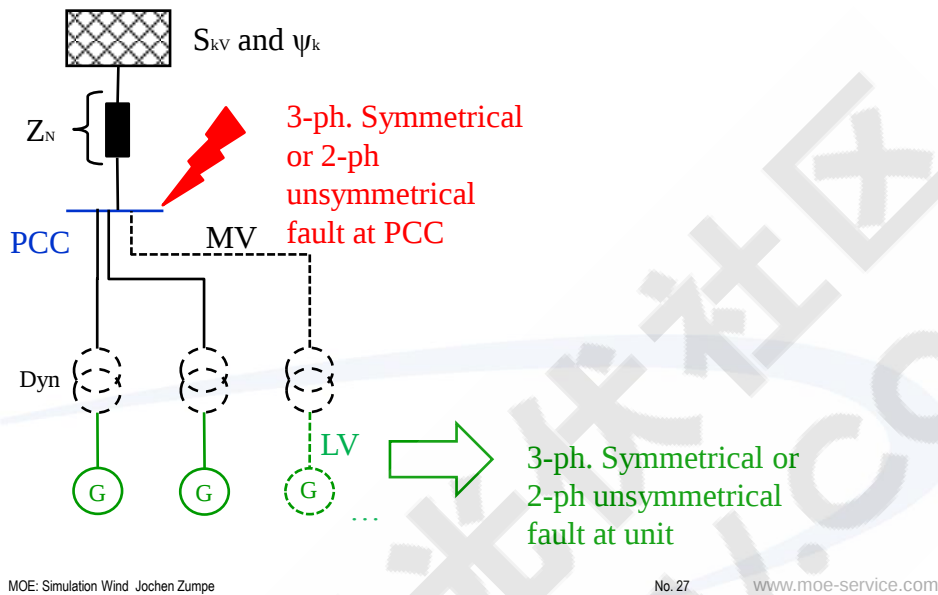
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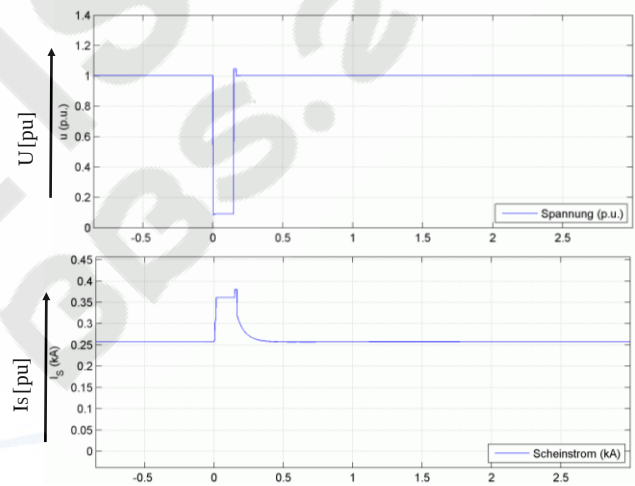
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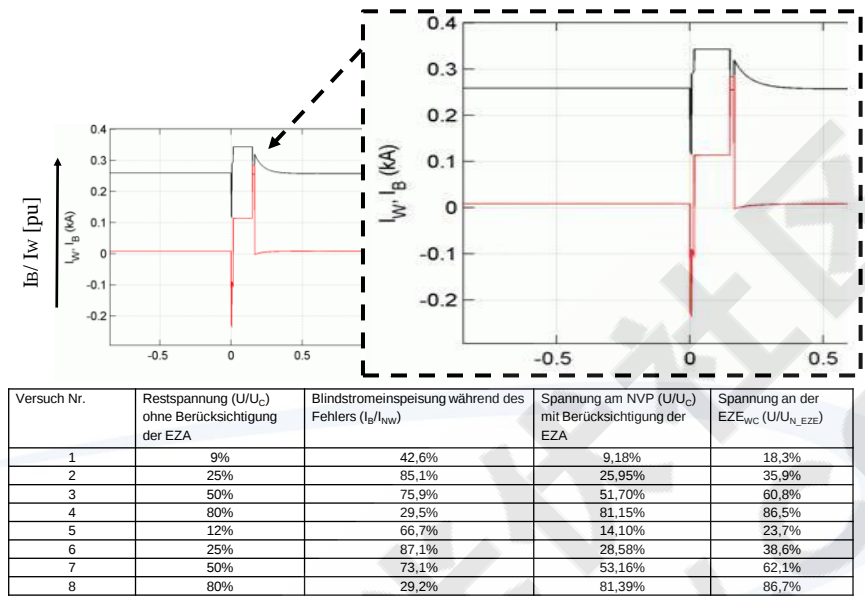
Example: LFRT Simulation of farm



LFRT Simulation of farm



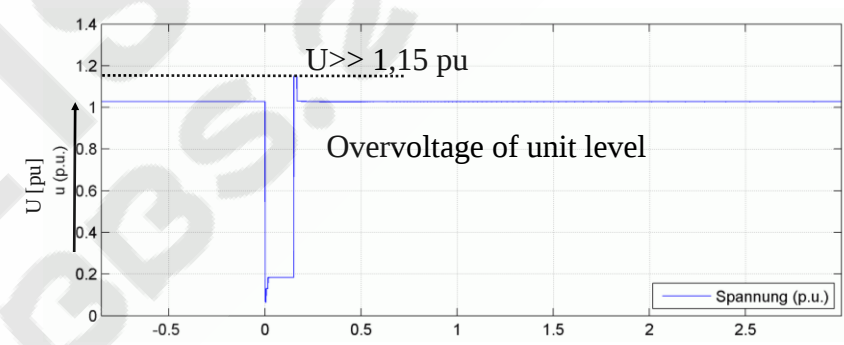
LFRT Simulation of farm



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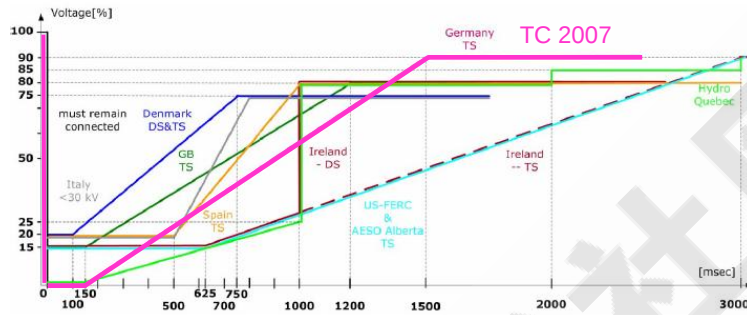
LFRT Simulation of unit



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Target Transfer to different voltage dips



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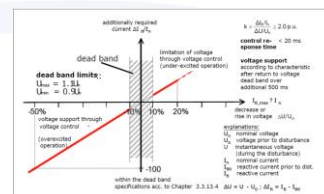
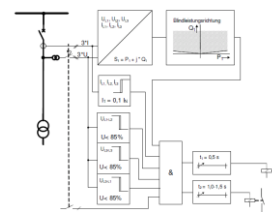
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Final Target aspect of the dyn. model

Simulation of

- the k-Factor at the turbine for the PCC
- Review of the grid protection settings
 - Overvoltage $U <$
 - Current $I <$ and $I <$
 - $Q > U$
- Level of LVRT trigger U_{LVRT}



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Advantage by certification process

Manufacture:

Independent Proven Quality has a better market share
Risk reduction to fail the requirement
Model and Knowledge is protected by NDA

Operator of power plant:

Independent process from the grid operator
Risk reduction and clear confirmation

Grid operator:

Less work for assessment
Reduction of liability
At least four eye check of results
None NDA with manufactory is necessary
Grid data confidential handled by the certification body

Power supply client and global:

transparency of the process and higher availability of
the service function of the power supply by RE

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Summary



Wind

- Since 2009 Bonus of 0.5 cent /kWh if certified
- Since 01.04.2011 without certification none payment acc. EEG.

Solar

- Since 01.04.2011 Solar parks > 1 MW certification for grid access

Biomass/block heat and power plant

- From 01.08.2013 full certification for grid access

Grid operator get much more information than ever before.
Independent body between developer/operator of solar or wind farm and Grid operator by the certification body

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Further Links

- Full 36 slides ppt download www.moe-service.com/Downloads
- Free open Generic model DIFG Model based on MatLab www.moe-service.com will be available in the two or three weeks

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