

Supplement to the Technical Guideline

Generating Plants Connected to the Medium-Voltage Network -

Guideline for generating plants' connection to and parallel operation with the medium-voltage network

June 2008 edition, BDEW

Determination of transitional periods for compliance with specific technical requirements of the Guideline concerning photovoltaic plants, fuel-cell plants and generating facilities with internal combustion engines

Status: January 2009

Supplement to the Technical Guideline

“Generating Plants Connected to the Medium-Voltage Network - Guideline for generating plants’ connection to and parallel operation with the medium-voltage network” (June 2008 edition)

Determination of transitional periods for compliance with specific technical requirements of the Guideline concerning photovoltaic plants, fuel-cell plants and generating facilities with internal combustion engines

The Technical Guideline on „Generating Plants Connected to the Medium-Voltage Network – Guideline for generating plants’ connection to and parallel operation with the medium-voltage network“ was issued by BDEW in June 2008 to replace the previous VDEW Guideline „Eigenerzeugungsanlagen am Mittelspannungsnetz“ [Industry’s own generating plants connected to the medium-voltage network] (2nd edition) published in 1998. After the separation of the network technology department from BDEW and its integration into VDE as Network Technology / Network Economy Forum (Forum Netztechnik / Netzbetrieb - FNN), issues relating to the contents of the Guideline and their implementation are dealt with by FNN.

The present supplement to the Guideline that was adopted within the FNN Forum, summarizes the solutions developed within an FNN Working Group with a view to taking account of a need for action at short notice resulting from the Guideline’s requirements on photovoltaic plants, fuel-cell plants and generating facilities with internal combustion engines.

The following representatives of specialist firms concerned collaborated in the Working Group set up by the FNN Forum to elaborate the supplement to the Guideline:

W. Bartels, RWE WVE Netzservice GmbH	R. Hüttner, envia Verteilnetz GmbH
H. Bayer, Mannheim	P. Knaup, Voltwerk electronics GmbH
W. Binde, B.KWK	G. Krieger, VDMA
C. Blome, MWM	H. Kühn, E.ON Netz GmbH
S. Bröscher, Pro2 Anlagentechnik GmbH	T. Kumm, VDE FNN
O. Cadet, Leroy Somer Power Generation	T. Meyer, EnBW Regional AG
V. Diedrichs, FH Wilhelmshaven	P. Ponsot, Leroy Somer Marbaise GmbH
F. Ehlers, E.ON Hanse AG	J.-M. Salzmann, E.ON edis AG
B. Engel, SMA Solar Technology AG	H.-D. Schäfer, EWE NETZ GmbH
S. Erling, ZVEI	M. Schneider, GE Jenbacher
T. Falk, BMU (German Federal Ministry for the Environment)	G. Stryi-Hipp, BSW Solar
K. Glöser, Juwi GmbH	J. Winterholler, MTU Onsite Energy
M. Haag, KACO Gerätetechnik GmbH	K.-H. Weck, FGH Zertifizierung
K. Heidenreich, Vatttenfall Europe Distribution Hamburg GmbH	H. Vihriälä, Cummins Generator Technologies GmbH

Contents

1	Introduction.....	3
2	Supplement to the Guideline / transitional periods.....	3
2.1	Photovoltaic plants and fuel-cell plants.....	3
2.2	Generating facilities with internal combustion engines.....	4
2.3	Survey.....	5
	Bibliography.....	5

1 Introduction

The technical Guideline „Generating Plants Connected to the Medium-Voltage Network – Guideline for generating plants’ connection to and parallel operation with the medium-voltage network“ was issued by BDEW in June 2008 [1] to replace the previous VDEW Guideline „Eigenerzeugungsanlagen am Mittelspannungsnetz“ [Industry’s own generating plants connected to the medium-voltage network] (2nd edition) published in 1998.

Generally, this Guideline [1] shall be applicable to new generating plants to be connected to a network operator’s medium-voltage network, and to existing generating plants which are subject to essential modifications (such as re-powering).

A generating plant may be composed of a single generator or of several generating units. The electrical energy can be generated by synchronous or asynchronous generators with or without converters or by direct-current generators with inverters.

As a matter of principle, the requirements of the technical Guideline „Generating Plants Connected to the Medium-Voltage Network“ (June 2008 edition, BDEW) are to be observed from 1st January 2009 (beginning of the Guideline’s validity [1]).

Requirements upon dynamic network support according to Chapter 2.5.1.2 of the Guideline are exempted from the aforementioned rule; they have to be observed only from 1st January 2010.

The date at which the complete application documents are available to the network operator shall be applicable.

Unit and plant certificates which certify that the unit or plant is in conformity with the requirements concerning at least the characteristics described in Chapters 6.2 to 6.6 of the Guideline [1] shall be submitted by the plant operator to the network operator by 30 June 2010 for generating plants for which an application has been filed to the network operator during the period from 1st January 2009 to 1st January 2010.

Transitional periods going beyond those mentioned above are described in Chapter 2 of this „Supplement to the Technical Guideline“

2 Supplements to the Guideline / Transitional periods

In addition to the Guideline [1], further transitional periods concerning specific technical requirements to be met by photovoltaic plants, fuel-cell plants and generating facilities with internal combustion engines are given hereinafter.

2.1 Photovoltaic plants and fuel-cell plants

The requirements in terms of **steady-state voltage control** according to Chapters 2.5.1.1 and 2.5.4 of the Guideline [1] must be satisfied **from 1st July 2010**, at the latest.

Furthermore, **from 1st July 2010**, at the latest, photovoltaic plants and fuel-cell plants must be capable in technical terms of making a contribution to dynamic network support (Chapter 2.5.1.2 of the Guideline [1]) (**limited dynamic network support**):

- The generating plant must not disconnect from the network in the event of network faults.
- After fault clearance, the generating plant must not extract more inductive reactive power from the network than prior to the occurrence of the fault.

From 1st January 2011, at the latest, photovoltaic plants and fuel-cell plants must be capable in technical terms of participating in **full dynamic network support**.

- The generating plant must not disconnect from the network in the event of network faults.
- During a network fault, the network voltage shall be supported by feeding a reactive current into the network.
- After fault clearance, the generating plant must not extract more inductive reactive power from the network than prior to the occurrence of the fault.

Basically, evidence has to be provided to the network operator according to Chapter 6 of the Guideline [1] showing that the **Guideline's requirements are satisfied**.

Not later than 1st July 2010, compliance with the requirements has to be proven at least through the forms F.1, F.4 and F. 5 given in Annex F of the Guideline [1] (or alternatively through the forms attached to the Technical Connection Conditions of network operators),

and by a relevant test report about the survey of the electrical properties with regard to the generating plant's connection to the network.

The full evidence to be provided of electrical properties (certification requirements) according to Chapter 6 of the Guideline [1] will thus become effective with a delay as from 1st July 2010.

2.2 Generating facilities with internal combustion engines

The requirements in terms of **steady-state voltage control** according to Chapters 2.5.1.1 and 2.5.4 of the Guideline [1] must be satisfied **from 1st January 2010**, at the latest.

Generating facilities with internal combustion engines need not make a contribution to dynamic network support until 1st January 2011.

Remarks:

- *As a matter of principle, generating facilities with internal combustion engines shall be technically capable in future of participating in dynamic network support. Therefore, solutions for implementing this objective will be elaborated by the end of 2009 between the Associations VDE FNN, VDMA and B.KWK on the basis of a differentiated examination of possible plant concepts (in general motor-generator coupling).*
- *The use of vector surge relays shall be admissible until 1st January 2011.*

Concerning the reduction of active power output according to Chapter 2.5.3 of the Guideline [1], the maximally admissible operating times in terms of motor engineering shall be taken into consideration for set points below 50 % of the agreed active connection power P_{AV} .

Basically, evidence shall be provided to the network operator showing that **the requirements of the Guideline** according to Chapter 6 of the Guideline [1] **are satisfied**.

Not later than 1st July 2010, compliance with the requirements has to be proven at least through the forms F.1, F.4 and F. 5 given in Annex F of the Guideline [1] (or alternatively through the forms attached to the Technical Connection Conditions of network operators), and by a relevant test report about the survey of the electrical properties with regard to the generating plant's connection to the network.

The full evidence to be provided of electrical properties (certification requirements) according to Chapter 6 of the Guideline [1] will thus become effective at the deadlines shown in Table 1 below.

2.3 Survey

Table 1 provides a survey of the transitional periods concerning specific technical requirements to be met in addition to the Guideline [1].

Table 1: Survey of transitional periods

Technical requirement	To be observed at the latest from:	
	Photovoltaic plants / fuel-cell plants	Generating facilities with internal combustion engines
Steady-state voltage control	01/07/2010	01/01/2010
Dynamic network support (limited)	01/07/2010	<i>up until 01/01/2011 no requirements concerning dynamic network support</i>
Dynamic network support (complete)	01/01/2011	
Certification obligation	01/07/2010	01/01/2010

The date at which the complete application documents are available to the network operator shall be applicable.

Bibliography

- [1] Technical Guideline „Generating Plants Connected to the Medium-Voltage Network – Guideline for generating plants’ connection to and parallel operation with the medium-voltage network“, June 2008, BDEW, Berlin