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**Datasheet for the decision
of 11 November 2021**

Case Number: T 1241/18 - 3.5.02

Application Number: 10751689.0

Publication Number: 2580829

IPC: H02H3/05, H02H7/26, H02H3/44,
H02H7/30

Language of the proceedings: EN

Title of invention:
Breaker failure protection of HVDC circuit breakers

Patent Proprietor:
ABB Power Grids Switzerland AG

Opponent:
General Electric Technology GmbH

Relevant legal provisions:
EPC Art. 108, 100(a), 56, 111(1)
EPC R. 99(2)
RPBA Art. 12(2), 12(4)

Keyword:

Admissibility of appeal - Appeal sufficiently substantiated
(yes)

Inventive step - Main request (no)

Auxiliary requests filed with the statement of grounds of
appeal - Sufficiently substantiated (no)

Appeal decision - Remittal to the department of first instance
(no)

Decisions cited:

T 1450/16, T 0855/15



Beschwerdekammern

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Case Number: T 1241/18 - 3.5.02

D E C I S I O N
of Technical Board of Appeal 3.5.02
of 11 November 2021

Appellant: General Electric Technology GmbH
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 27 March 2018
rejecting the opposition filed against European
patent No. 2580829 pursuant to Article 101(2)
EPC.**

Composition of the Board:

Chairman R. Lord
Members: C.D. Vassoille
W. Ungler

Summary of Facts and Submissions

- I. The appeal of the opponent lies against the decision of the opposition division rejecting the opposition against European patent no. 2 580 829.
- II. The following documents are relevant for the present decision:
- D4: US 4,172,268 B1
- D7: IEEE Guide for Breaker Failure Protection of Power Circuit Breakers (C37.119-2005).
Publication/version date: 6 March 2006.
- III. In a communication under Article 15(1) RPBA 2020, annexed to the summons to hold oral proceedings, the board *inter alia* informed the parties of their preliminary opinion, according to which the appeal seemed to be admissible and that the maintenance of the patent as granted appeared to be prejudiced by the ground for opposition under Articles 100(a) and 56 EPC. As regards the first to fifth auxiliary requests filed with the reply to the appeal, the board further expressed their preliminary view that it seemed to be questionable whether these auxiliary requests had been sufficiently substantiated in the reply to the appeal within the meaning of Article 12(2) RPBA 2007.
- IV. Oral proceedings before the board took place on 11 November 2021 in the presence of only the patent proprietor.

The appellant (opponent) had requested in writing that the decision under appeal be set aside and that the patent be revoked.

The respondent (patent proprietor) requested that the appeal be rejected as inadmissible or that the appeal be dismissed (main request). As an auxiliary measure the respondent requested that the decision under appeal be set aside and the patent be maintained in amended form according to one of the first to fifth auxiliary requests, each of these requests filed with the reply to the statement of grounds of appeal. Furthermore, the respondent requested remittal of the case to the department of first instance if the board were to come to the conclusion that the main request was not allowable.

V. Claim 1 of the respondent's main request (patent as granted) reads as follows:

"A breaker failure protection system (100, 200) for a high voltage direct current, HVDC, circuit breaker (103) arranged for interrupting a DC circuit (101,102) upon reception of a trip signal (108, 308), the system comprising:

a current sensor (104) being arranged for measuring a current $I(t)$ through the DC circuit,
at least one inductor (105, 106) connected in series with the DC circuit, and
a breaker failure detection unit (107, 300) being arranged for:

retrieving a trip signal (108) used for triggering the circuit breaker (103),

assessing, on the basis of the measured current (309) received from the current sensor (104), whether the circuit breaker has failed, and sending, if the circuit breaker has failed, a trip signal (109) to an adjacent circuit breaker."

VI. Having regard to the board's decision on the admissibility of the first to fifth auxiliary requests, it is not necessary to reproduce the wording of these requests here.

VII. The arguments of the appellant which are relevant for the present decision are as follows:

Inventive step in view of D7

The subject-matter of claim 1 did not involve an inventive step in view of D7. The subject-matter of claim 1 merely differed from D7 in that a DC circuit was interrupted upon reception of a trip signal, the current through the DC circuit was measured by a DC current sensor and that an inductor was provided in series with the DC circuit. The objective technical problem was to be considered to be that of how to provide breaker failure protection for an HVDC circuit breaker.

The breaker failure protection control strategy of D7 was independent of the type (AC or DC), design and voltage rating of a circuit breaker, and the skilled person would thus recognise that the breaker failure detection system of D7 may equally be applied to an HVDC system. Reference was made in particular to figure 2 of D7, illustrating a basic breaker failure protection scheme without mentioning AC- or DC-specific features. The provision of inductors to limit inrush

currents was a well-known measure for DC circuits and did not involve an inventive step.

VIII. The arguments of the respondent which are relevant for the present decision are as follows:

Admissibility of the appeal

The appeal was not admissible. The statement of grounds of appeal merely contained a repetition of the arguments submitted during the first instance proceedings. No link was apparent between the reasoning of the opposition division in the decision under appeal and the arguments provided by the appellant in the statement of grounds of appeal, which thus was not sufficiently substantiated.

Inventive step in view of D7

The subject-matter of claim 1 involved an inventive step in view of document D7. The subject-matter of claim 1 differed from D7 in being for a high voltage direct current (HVDC) circuit, and in comprising a current sensor that was arranged for measuring a current through that DC circuit and at least one inductor connected in series with the DC circuit. The objective technical problem was thus to be considered to be that of adapting the breaker failure protection system of D7 to other application scenarios. Document D7 exclusively referred to AC systems. AC systems were fundamentally different from DC systems and implied different persons skilled in the art. Document D7 therefore was not a suitable starting point in the assessment of inventive step. At the time of publication of document D7, HVDC did not play a significant role in the industry and it was also not an

issue at the effective date of the patent under appeal. Implementing the breaker disclosed in D7 in an HVDC system would have necessitated drastic modifications that went far beyond routine measures of the person skilled in the art. In particular, concepts and devices for measuring a fault current were inherently different in AC and DC systems. Furthermore, document D7 referred to the drawbacks when using inductors, which would have prevented the person skilled in the art from using an inductor, when transferring the invention of D7 to another application such as an HVDC system.

Admissibility of the first to fifth auxiliary requests

Since the patent was maintained as granted by the opposition division, the respondent only had to present arguments regarding the main request. Article 12(2) RPBA 2007 did not require the respondent to provide the complete case also with respect to auxiliary requests, but rather specified that a party shall set out the reasons why it is requested that the decision under appeal be upheld, which in the present case corresponded to the respondent's main request.

Reasons for the Decision

1. *Admissibility of the appeal*

- 1.1 The appeal is admissible within the meaning of Article 108 EPC in conjunction with Rule 99(2) EPC. In particular, the statement of grounds of appeal are sufficiently substantiated to satisfy the requirements of Rule 99(2) EPC.

- 1.2 It might be true that the statement of grounds of appeal in the case at hand do not explicitly refer to specific parts of the decision under appeal and comprise to a large extent a repetition of a line of argumentation that was provided in an identical form before the opposition division.
- 1.3 In this context, the board first notes that an explicit reference to the specific reasons provided in the decision under appeal cannot be considered as a mandatory requirement in order to establish a causal relationship between the arguments in the statement of grounds of appeal and the reasons given in the decision under appeal. Rather, a corresponding causal relationship can result without an explicit reference, which the board considers to be the case here.
- 1.4 Furthermore, the sole fact that a statement of grounds of appeal contains a repetition of arguments provided before the opposition division as such is not sufficient for the appeal to be considered insufficiently substantiated. Rather, other factors must be taken into account in this context, in particular the question whether the nature of the first instance proceedings as well as the decision under appeal would have necessitated a correspondingly adapted line of argumentation on the part of the appellant or an explicit discussion of a specific reasoning provided by the opposition division in the decision under appeal.

The board is convinced that, in the present case, the first instance proceedings and more specifically the decision under appeal did not give rise in any way to the necessity for an adapted line of argumentation or a

focused discussion of particular reasons given in the decision under appeal.

In this context, the board observes that the relevant parts of the decision under appeal contain a summary of the parties' arguments followed by the opposition division's opinion. The appellant's arguments provided in the statement of grounds of appeal are clearly consistent with the arguments that were taken into account by the opposition division.

1.5 Furthermore, as was correctly stated by the respondent, it is the primary object of the appeal proceedings to review the decision under appeal in a judicial manner (Article 12(2) RPBA 2020). In the present case, the decision under appeal did not contain anything that would have given the appellant reason to correct or adapt their line of argumentation or to expressly discuss certain views adopted by the opposition division. The repetition of the substantial arguments already put forward in the first instance proceedings therefore was a justified reaction to the decision under appeal in the specific case, which served the purpose of convincing the board.

1.6 The board also considers the quality of the content of the statement of grounds of appeal in the present case as sufficient to understand the essential arguments. The statement of grounds of appeal provided detailed and well-reasoned arguments on the points that were discussed in the decision under appeal, namely novelty of the subject-matter of claims 1 and 4 over D6 and inventive step of the subject-matter of claims 1 and 4 in view of D7. Furthermore, the board observes that the respondent replied in detail to the observations provided in the statement of grounds of appeal and the

board therefore cannot see that they had any difficulties to understand why the appellant, in contrast to the opposition division, was of the opinion that the subject-matter of claims 1 and 4 is not novel in view of D6 and does not involve an inventive step in view of D7.

- 1.7 The findings in appeal case T 2012/16 cited by the respondent are not applicable to the present case, as the circumstances of that case were different. In particular, the board does not see that the statement of the grounds of appeal in the present case makes it difficult to immediately understand why the decision under appeal was considered to be incorrect and on what facts the appellant based their arguments. In particular, the board did not need to conduct their own investigations in the present case, which would go beyond the usual level of investigation to be expected.
- 1.8 Appeal case T 1311/13, also cited by the respondent, is concerned with the question of whether a specific ground of appeal is sufficiently substantiated (reasons 19). This decision therefore concerns a different issue, in particular one that is not readily applicable to the present case, which is concerned with the question of whether the statement of grounds of appeal fulfils the requirement of Rule 99(2) EPC, according to which the appellant shall indicate the reasons for setting aside the decision under appeal and the facts and evidence on which the appeal is based. The board therefore does not consider the respondent's arguments in this respect relevant to the present case.
- 1.9 Nor is it apparent that a particularly detailed reasoning of the opposition division would have required an increased level of detail of the statement

of grounds of appeal. In fact, point 15.2 of the reasons for the decision under appeal consists largely of a repetition of the parties' arguments, while the opposition division expressed their own opinion on novelty of the subject-matter of claim 1 merely in a single paragraph on page 6. An even shorter paragraph of the division's reasoning on novelty of the subject-matter of claim 4 is present on page 7.

1.10 The board has therefore come to the conclusion that the requirements of Article 108 EPC in conjunction with Rule 99(2) EPC are fulfilled. Given that the further requirements under Rule 101(1) EPC are also fulfilled, the appeal is admissible.

2. *Main request - Inventive step in view of D7*

2.1 *Suitable starting point*

2.1.1 The board does not agree with the respondent that document D7 could not be considered as an appropriate starting point in the assessment of inventive step, because the skilled person of document D7 was competent in the field of AC systems, while the skilled person of the subject-matter of claim 1 was competent in the field of DC systems, which made D7 unsuitable as a starting point in the assessment of inventive step.

2.1.2 The selection of an appropriate starting point in the assessment of inventive step is an objective exercise carried out by the deciding body applying the established criteria. Several criteria have been developed in the case law of the Boards of Appeal in order to establish whether a document could be considered as a suitable starting point in the assessment of inventive step, and in particular whether

a document is the "closest prior art" (see Case Law of the Boards of Appeal, 9th edition 2019, I.D.3). The board therefore concurs with the findings in T 1450/16 (reasons 2.1.4) and T 0855/15 (reasons 8.2) to the extent that it is not the person skilled in the art that selects a suitable starting point, and in particular the closest prior art document, in the assessment of inventive step.

Against this background, in the board's view, the question of who is the competent skilled person is irrelevant at least as regards the selection of a suitable document as a starting point in the assessment of inventive step, because it is not the notional skilled person within the meaning of Article 56 EPC that selects the appropriate starting point.

- 2.1.3 The board considers document D7 to be a suitable starting point in the assessment of inventive step of the subject-matter of claim 1. The subject-matter of claim 1 and document D7 are both concerned with a breaker failure detection system, which relate to the same purpose, namely to increase the stability of a power grid by more reliably interrupting a power transmission circuit during a grid fault event. In both cases, D7 and the invention as defined in claim 1, this is achieved by a breaker failure detection unit that is arranged for retrieving a trip signal used for triggering the circuit breaker, assessing, on the basis of a measured current received from a current sensor, whether the circuit breaker has failed, and sending, if the circuit breaker has failed, a trip signal to an adjacent circuit breaker. This was not disputed by the respondent.

2.1.4 Although document D7 and the subject-matter of claim 1 are described in terms of different types of power transmission systems (AC, DC), they are thus both concerned with the same subject-matter and serve the same purpose, which clearly qualifies D7 as a suitable starting point in the assessment of inventive step of the subject-matter of claim 1.

The board has therefore arrived at the conclusion that document D7 is a suitable starting point in the assessment of inventive step and the appellant's sole objection under Articles 100(a) and 56 EPC based on this document thus had to be taken into account in the appeal procedure.

2.2 *Distinguishing features*

It was not in dispute between the parties that the subject-matter of claim 1 differs from document D7 only in the features of claim 1, which are specific to the claimed intended use of the breaker failure detection system for an HVDC breaker arranged for interrupting a DC circuit, namely:

- a current sensor being arranged for measuring a current through the DC circuit, and
- at least one inductor connected in series with the DC circuit.

2.3 *Objective technical problem*

The board agrees with the respondent that the objective technical problem may be considered to be that of how to adapt the breaker failure protection system of D7 to other application scenarios.

2.4 *Competent skilled person*

2.4.1 In view of the objective technical problem, the board considers the competent skilled person in the relevant technical field to be an expert in power transmission systems, who typically is a graduate engineer in electrical engineering or physics with focus on protection systems such as circuit breakers, who has several years of practical experience as a developer in industry. The competent skilled person consequently not only has a broad knowledge in AC power transmission systems but also in (HV)DC transmission systems including circuit breakers for these types of applications.

2.4.2 In this context, it is to be noted that at the time of publication of D7 (2006), AC transmission systems might have been the dominant technology for large scale power transmission. However, at the effective date of the patent under appeal (14 June 2010), the development of high power semiconductor switches for inverters, such as IGBTs, had already led to an improved practical applicability of HVDC transmission systems. Therefore, while it might be true that AC transmission systems, at the effective date of the patent under appeal, were still the prevailing technology, the skilled person at that time clearly was also aware of developments in the relevant technical field of HVDC transmission systems and had profound knowledge of this technology.

2.4.3 The board agrees with the respondent that document D7 refers to a breaker failure detection system that is obviously foreseen to be used in an AC transmission system. However, the board agrees with the point of view taken by other technical boards of appeal that the skilled person within the meaning of Article 56 EPC

usually is the person qualified to solve the objective technical problem rather than the person competent in the field of the claimed invention or the closest prior art (see T 1450/16, reasons 2.1.4 and cited decisions).

The board therefore does not consider the respondent's argument convincing according to which the skilled person in the case at hand is exclusively competent in the field of AC systems. In this context, it is further to be noted that the technical fields of circuit breakers for AC and DC systems are so closely related that a clear boundary between the respective competent notional skilled persons within the meaning of Article 56 EPC cannot be clearly drawn anyway.

2.5 *Obviousness*

- 2.5.1 Providing the breaker failure detection system of D7 for an HVDC circuit breaker in order to interrupt a DC circuit, and to thereby implement a current sensor arranged to measure a current in a DC circuit as well as an inductor connected in series to a DC circuit, would have been obvious to the person skilled in the art at the effective date of the patent under appeal.
- 2.5.2 The skilled person would have considered HVDC circuit breakers arranged to interrupt DC circuits when searching for other areas of application for the breaker failure detection system of D7. In this respect, it is to be noted that, as set out under point 2.4 above, at the effective date of the patent under appeal, the practical applicability of HVDC transmission systems had become widely developed, and these systems were known to be advantageous under certain conditions. Therefore, while it might be true that at the effective date of the patent under appeal,

AC transmission was still the prevailing technology, the skilled person at that time clearly was also aware of developments in HVDC power transmission and the board has no doubts that HVDC circuit breakers in a DC circuit therefore would have been considered by the skilled person as a suitable field of application.

- 2.5.3 Furthermore, the skilled person, when providing the breaker failure detection circuit of D7 for use with an HVDC circuit breaker in a DC circuit, would have been well aware of the necessity to provide an inductor to avoid a sudden change in current through the faulty circuit breaker and the adjacent breakers. There cannot be any doubt that the provision of inductors to limit a current rise is standard practice in DC circuits and therefore does not contribute to an inventive step.

In this respect, it is further to be noted that the skilled person would have recognised immediately that the problems, in particular related to faults in (inductive) harmonic filters, and the provision of an auxiliary signal, as disclosed in D7, section 7.6 on page 13, are entirely AC specific and consequently as not applying to DC circuits. The arguments presented by the respondent in this context, in particular the argument that D7 would have prevented the skilled person from providing an inductor connected in series to the DC circuit, therefore do not convince the board.

The teaching of D4, in particular figure 5 (inductor Ls), is in no way contrary to this understanding. The board considers this document to merely confirm the view that the person skilled in the art would insert an inductor at a suitable position in the DC circuit without involving an inventive step.

In this context, it is further to be noted that claim 1 broadly defines the at least one inductor as being connected in series with the DC circuit, which is an obvious position of the inductor to limit the current flow when it commutates from a faulty circuit breaker to an adjacent circuit breaker during a failure.

- 2.5.4 Similarly, the provision of a current sensor arranged for measuring a current through the DC circuit is standard practice, and would not have confronted the skilled person with any difficulties when providing the breaker failure detection system as disclosed in D7 for use with an HVDC circuit breaker in a DC related system.

In this respect, the board further notes that D7, especially on page 23, indeed refers to complex current sensing considerations in an AC circuit. However, this would not have prevented the skilled person in any way from implementing the breaker failure detection circuit of D7 for use with an HVDC circuit breaker in a DC circuit. To the contrary, the skilled person would have immediately recognised that the corresponding challenges are specific to AC circuits and therefore do not apply to DC circuits.

- 2.5.5 The board thus has arrived at the conclusion that the person skilled in the art, taking D7 as a starting point, would have recognised at the effective date of the patent under appeal, in view of the then practical applicability of HVDC power transmission systems and corresponding HVDC circuit breakers, without involving an inventive step, that the objective technical problem was to be solved by providing the breaker failure detection system of D7 for an HVDC circuit breaker to interrupt a DC circuit. The modifications to be made in

this context were obvious minor adaptations to the specific application for an HVDC circuit breaker in a DC circuit, which pertained to the common general knowledge of the competent skilled person (see the board's remarks under point 2.4 above).

- 2.5.6 The board has therefore arrived at the conclusion that the subject-matter of claim 1 as granted is rendered obvious in view of document D7 in combination with the common general knowledge of the competent person skilled in the art. Consequently, the subject-matter of claim 1 does not involve an inventive step and the maintenance of the patent under appeal is thus prejudiced by the ground for opposition under Article 100(a) EPC in combination with Article 56 EPC.

3. *First to fifth auxiliary requests - Admissibility*

- 3.1 The first to fifth auxiliary requests filed with the respondent's reply to the appeal are not admitted into the appeal procedure, because they do not meet the requirements of Article 12(2) RPBA 2007, applicable under Article 25(1) RPBA 2020.
- 3.2 In the reply to the appeal, the respondent requested that the patent be maintained according to one of the first to fifth auxiliary request (see page 1 of the reply). The only further mentioning of the auxiliary requests in the reply to the appeal is on page 14, where it is stated that

"...Proprietor has - despite the positive findings in the Opposition Division's preliminary opinion - prepared and filed a first, second, third, fourth or fifth auxiliary request in line with the time-limit according to Rule 116 EPC. We maintain these

auxiliary requests and resubmit the respective sets of claims as part of the present response."

3.3 While it is true that the respondent had already filed the first to fifth auxiliary requests with letter of 6 December 2017 before the opposition division and provided arguments with regard to Article 123(2) EPC in this context, the board observes that neither in the first instance proceedings nor in the reply to the appeal, did the respondent provide any arguments as regards the question of how the appellant's objections might be overcome by these requests.

3.4 Article 12(2) RPBA 2007 requires that the statement of grounds of appeal and the reply shall contain a party's complete case and that they shall set out clearly and concisely the reasons why it is requested that the decision under appeal be reversed, amended or upheld, and should specify expressly all the facts, arguments and evidence relied on. Article 12(4) RPBA 2007 further indicates that the parties' submissions under paragraph (1) of that article shall be taken into account by the board only if and to the extent that they meet the requirements of paragraph (2).

In the present case, the opposition division's finding in the decision under appeal that the patent under appeal was to be maintained does not release the patent proprietor (respondent) from their obligation to also substantiate further requests. With the auxiliary requests, the respondent requests the maintenance of the patent in amended form, which is expressly covered by the wording of Article 12(2) RPBA 2007, according to which it must be explained on what grounds the patent is to be maintained in amended form. The respondent's "complete case" in the sense of Article 12(2) RPBA 2007

therefore is to be considered to also refer to the auxiliary requests.

3.5 The board notes that the primary object of the appeal is to review the decision under appeal (Article 12(2) RPBA 2020) and the respondent therefore had to take into account that the board might accede to the appellant's request to set the decision under appeal aside. As set out before, however, the respondent has neither in the first instance proceedings nor in the reply to the appeal in any way argued on what grounds the auxiliary requests were deemed to overcome the appellant's objections.

3.6 It is further to be noted that the appellant in the statement of grounds of appeal not only objected to claim 1 of the main request but also presented arguments as to why the subject-matter of the dependent claims of the patent as granted was not patentable, and that at least some of the auxiliary requests were based on those claims.

The board therefore does not agree with the respondent that neither the decision under appeal nor the statement of grounds of appeal gave rise to a detailed argument as regards the patentability of the auxiliary requests.

3.7 In light of the above considerations, the board has decided to exercise its discretion under Article 12(4) RPBA 2007 not to admit the first to fifth auxiliary requests into the appeal proceedings.

4. *Request for remittal*

The respondent requested remittal of the case to the department of first instance if the board were to come to the conclusion that the main request was not allowable.

According to Article 111(1) EPC, a board may remit the case to the department of first instance for further prosecution.

However, in the case at hand, the respondent's main request was not allowable and the first to fifth auxiliary requests were not admitted into the appeal procedure. There is thus no factual basis for a remittal of the case to the opposition division and the board consequently has decided to reject the respondent's request to remit the case to the department of first instance.

5. *Result*

Given that the appeal was found to be admissible and that the ground for opposition under Article 100(a) EPC in combination with Article 56 EPC prejudices the maintenance of the patent as granted, and further considering that the first to fifth auxiliary requests were not admitted into the appeal procedure, the board had to accede to the appellant's request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:



U. Bultmann

R. Lord

Decision electronically authenticated