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**Datasheet for the decision  
of 7 May 2015**

**Case Number:** T 1876/12 - 3.2.03  
**Application Number:** 05820267.2  
**Publication Number:** 1963616  
**IPC:** E21B33/035, E21B33/038,  
B63C11/00, B63C11/42  
**Language of the proceedings:** EN  
**Title of invention:**  
ELECTRICAL POWER SYSTEM FOR A SUBSEA SYSTEM  
**Patent Proprietor:**  
Siemens Aktiengesellschaft  
**Opponent:**  
Vetco Gray Scandinavia AS  
**Headword:**

**Relevant legal provisions:**

EPC Art. 114(2), 100(c), 100(a), 123(2), 54, 56  
RPBA Art. 12(4)

**Keyword:**

Amendments - added subject-matter (no)  
Late-filed evidence - admitted (no)  
Novelty - (yes)  
Inventive step - (yes)

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**Catchword:**



**Beschwerdekammern  
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Case Number: T 1876/12 - 3.2.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.03**  
**of 7 May 2015**

**Appellant:** Vetco Gray Scandinavia AS  
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**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
20 June 2012 concerning maintenance of the  
European Patent No. 1963616 in amended form.**

**Composition of the Board:**

**Chairman** G. Ashley  
**Members:** V. Bouyssy  
M. Blasi

## **Summary of Facts and Submissions**

- I. European patent No. 1 963 616 (in the following: "the patent") concerns an electrical power system for a subsea system.
- II. The patent as a whole was opposed on the grounds of Article 100(c) EPC and Article 100(a) EPC, for lack of novelty and inventive step.
- III. The Opposition Division decided that, account being taken of the amendments made by the patent proprietor during the opposition proceedings, the patent and the invention to which it relates meet the requirements of the EPC (Article 101(3) (a) EPC).
- IV. This interlocutory decision has been appealed by the opponent (here appellant).
- V. With the summons to oral proceedings, the Board sent a communication pursuant to Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA) indicating to the parties its preliminary opinion of the case.
- VI. Oral proceedings before the Board were held on 7 May 2015.
- VII. Requests

The appellant (opponent) requested that the appealed decision be set aside and the patent be revoked.

The patent proprietor (here respondent) requested that the appeal be dismissed (main request), alternatively that the patent be maintained on the basis of one of

auxiliary requests 1 to 9, all as filed with the reply to the statement of grounds of appeal.

VIII. Claims of the respondent's main request

Independent claim 1 reads as follows (compared with claim 1 as originally filed with application WO 2007/071266 A1, added features are indicated in bold, deleted features in strike-through):

"1. Electrical power system for a subsea system (10) comprising at least one subsea power distribution system (5) receiving power from a power source, said subsea power distribution system (5) comprising at least one electrical functional component (6), and at least one connecting member for at least one electrical load (7) for subsea operation, ~~characterised in that~~ **whereas** ~~an external~~ **a first** pressurised casing (12) is provided for the subsea power distribution system (5), and that at least one ~~internal~~ **second** pressurised casing (13) is provided for the at least one electrical functional component (6), **wherein**  
**the first pressurised casing (12) is encapsulating the subsea power distribution system (5) and the at least one electrical functional component (6), the at least one second pressurised casing (13) being encapsulated within the first pressurised casing (12),**  
**the first pressurised casing (12) and the second pressurised casing (13) being arranged in a two-stage pressure system, and**  
**the subsea system (10) being connectable to at least one cable (9) for power transmission from the power source to the subsea system (10)."**

Dependent claims 2 to 18 define preferred embodiments of the electrical power system of claim 1. Independent claim 19 relates to a method for operating an electrical load using the electrical power system of any of claims 1 to 18.

IX. Cited evidence

- a) In the statement of grounds of appeal, the appellant referred to the following prior art documents which were filed in the opposition proceedings and are cited in the appealed decision:

D1: US 4,337,829 A  
D2: WO 02/41336 A1  
D3: WO 99/63555 A2  
D4: DE 101 27 276 A1  
D5: US 4,309,734 A  
D6: WO 99/20872 A1  
D7: Snary P. et al., "Drive Systems for Operation on Deep-Sea ROVs", Proceedings of EPE 2003, Toulouse, ISBN 90-75815-07-7

Of these D7 was filed after expiry of the opposition period.

- b) In the statement of grounds of appeal, the appellant also relied on the following evidence for the first time:

D8: WO 2004/008183 A2

- X. The arguments of the parties in the written and oral proceedings, insofar as relevant for the present decision, can be summarised as follows:

a) Main request - Article 100(c) EPC

Appellant's case:

The subject-matter of claim 1 extends beyond the content of the application as filed.

Firstly, claim 1 recites that the first pressurised casing is "encapsulating" the subsea power distribution system and the electrical functional component, the second pressurised casing "being encapsulated" within the first pressurised casing, but the words "encapsulating" and "being encapsulated" cannot be derived from the application as originally filed.

Secondly, claim 1 defines "a two-stage pressure system" but lacks the feature that it is achieved by filling the second pressurised casing with a liquid while filling the first pressurised casing at least partly with a gas or a mixture of gases (see paragraph bridging pages 7 and 8 as published).

Thirdly, claim 1 defines a "cable for power transmission from the power source to the subsea system" but lacks the feature that this cable is connected to a topside power system or a topside converter providing a high frequency power (see page 6 and claim 15 as filed).

Respondent's case:

Claim 1 is a combination of claims 1 and 15 as granted. As ruled by the Opposition Division, none of the appellant's objections is convincing.

The words "encapsulating" and "being encapsulated" have been introduced to make clear that the first pressurised casing is an external casing, while the second pressurised casing is an internal casing arranged within the external casing, in accordance with the original teaching.

The introduction of the feature "two-stage pressure system" is supported by the teaching in the application as filed; see page 2, lines 18 and 19 and the paragraph bridging pages 7 and 8.

The introduction of the cable feature is supported by the teaching in the application as filed; see claims 1 and 15, page 4, line 4, page 6, lines 1 to 13 and 25.

b) Consideration of D8 in the proceedings

Respondent's case:

D8 should not be considered because it was not filed in due time and it is *prima facie* no more relevant than the prior art documents already on file. In particular, D8 does not disclose any casing, enclosure or the like for protecting electrical components against high ambient pressure.

Appellant's case:

D8 was introduced at the appeal stage as additional support of the argument that it was generally known in the relevant field to use a two-stage pressure system to protect electrical components from high levels of ambient pressure.



c) Main request - Novelty in the light of D5

Appellant's case:

D5 discloses in Figure 1 a subsea petroleum installation with a subsea distribution manifold 14 which contains a power distribution system comprising electrical functional components, including a power transformer 28, a plurality of feeder couplers 30 and current-limiting circuits 40, 42 and 44 (column 6, line 37 to column 7, line 40). As shown in Figure 1, distribution manifold 14 is a closed housing or casing and, since it is submerged several hundred feet or more in the water (column 6, lines 37 to 39), it must be pressurised to resist a high ambient pressure. Thus, distribution manifold 14 forms an external pressurised casing. It follows from column 7, lines 35 to 39 of D5 that circuits 40, 42 and 44 may all be contained within a hermetically sealed package, which implicitly provides a protection against water ingress and ambient pressure and thus forms an internal pressurised casing. In addition, as shown in Figure 1, transformer 28 and all feeder couplers 30 are enclosed in dedicated pressurised casings, which are arranged within manifold 14. In conclusion, the power distribution subsea system in Figure 1 of D5 shows all the features of claim 1.

Respondent's case:

In Figure 1 of D5, power from a topside power source is distributed by distribution manifold 14 to several wellhead assemblies 16, via feeder couplers 30 and power cables 32. D5 is concerned with the problem that, when a power coupler is disconnected, current in the

power cable increases markedly, which risks damaging the coupler. D5 does not disclose any pressure-sensitive electrical components which must be protected from high levels of ambient pressure, nor any pressurised casing to protect such components. D5 discloses an hermetically sealed package containing all circuits 40, 42 and 44, but this package does not form a pressurised casing in the sense of claim 1; it is simply a barrier against seawater ingress and it forms a part of the power cable 32 (see Figure 2). It can also not be derived from D5 that transformer 28 or any feeder coupler 30 is enclosed in a pressurised casing, even though these components are shown as functional boxes in Figure 1. Similarly, even though manifold 14 is illustrated schematically as a functional box in Figure 1 of D5, there is no indication whatsoever that it is a closed casing encapsulating the subsea power system. On the contrary, manifold 14 cannot be a closed casing, since the feeder couplers 30 must remain accessible from the outside, as their function is to allow connection/disconnection of the power cables 32. Thus, in the context of D5, distribution manifold 14 must be, as is usual in the art, an open structure supporting transformer 28, couplers 30 and circuits 40, 42 and 44, all these components being simply contained within the outline of the manifold.

d) Main request - Inventive step in light of D5

Appellant's case:

When starting from Figure 1 of D5, the technical problem to be solved is how to protect pressure-sensitive electrical components 40, 42 and 44 against high levels of ambient pressure, whereby the protection should not be too bulky or heavy. In the light of

common general knowledge, or the teaching of D6 (page 2, lines 10 to 13 and page 11 with Figure 3), the skilled person faced with this problem would inevitably modify distribution manifold 14 and the package protecting circuits 40, 42 and 44 so that they become external and internal pressurised casings respectively. By doing so he would arrive at the subject-matter of claim 1. Thus, the claimed subject-matter lacks an inventive step against D5 in combination with common general knowledge, or alternatively in combination with D6.

Respondent's case:

The argument based on the combination of D5 with D6 constitutes an amendment to the appellant's case, which should not be allowed in the proceedings because it could have been presented in the opposition proceedings and it lacks relevance.

Be that as it may, the electrical components of D5 are pressure insensitive, hence a skilled person has no motivation to provide pressurised casings to protect such components against ambient pressure. Further, the gist of D5 is that the current can be limited by placing circuits 40, 42 and 44 within power cable 32 while keeping feeder couplers 30 accessible for connection/disconnection; thus D5 teaches away from placing the circuits and couplers within a pressurised casing. Starting from D5, a skilled person has no reason to consider D6, as it is concerned with a technical problem remote from that of D5, namely with the protection of the pressure-sensitive electronic components, in particular timing/frequency elements, of a computer system for controlling hydro/mechanical tools. Finally, the entire thrust of D6 is that an

external pressurised casing can be avoided when pressure-sensitive electronic components are enclosed in dedicated micro pressure vessels. Thus, even if the skilled person were to combine D5 and D6, he would not arrive at the claimed two-stage pressure system formed by nested pressurised casings.

e) Main request - Inventive step in the light of D2

Appellant's case:

D2 discloses, in Figure 2, an electrical power system 40 comprising a power distribution system for a subsea environment (page 4, lines 28 to 31). The system 40 is connectable to a power cable by a high voltage connection 31. The power distribution system comprises connecting members for electrical loads for subsea operations (see busbars 32 and connections 33 for connection of the system to the consumers), as well as electrical functional components (see "switches for turning on/off the individual consumers" on page 7, lines 26 to 29). The chamber 30, which encapsulates the power distribution system and the electrical functional components, forms an external/first pressurised casing in the sense of claim 1. Thus, the system of claim 1 differs from that of D2 only in that at least one electrical functional component, i.e. a switch or a part of it, is encapsulated within an internal/second pressurised casing, which itself is encapsulated within the first pressurised casing.

The objective problem solved by these features is how to protect the pressure-sensitive switch, or switch part, from high ambient pressure at a great sea depth. D6 addresses this problem (page 2, lines 10 to 13) and teaches that it can be solved by enclosing pressure-

sensitive electrical components in micro pressure vessels A, which are placed inside a pressurised housing B. For a skilled person seeking to solve the above problem it would be obvious to consider the teaching of D6 and to combine it with that of D2 by encapsulating a switch (part) of D2 in a micro pressure vessel and arranging this vessel within pressurised casing 30 of D2. By doing so, he would arrive at the two nested pressurised casings required in claim 1.

Respondent's case:

As ruled by the Opposition Division, the system of D2 fails to disclose a two-stage pressure system as required in claim 1.

Starting from D2, the skilled person has no reason to consider the teaching of D6 and combine it with that of D2, as these documents relate to different electrical components and different technical problems. Firstly, D6 does not relate to a subsea power distribution system as disclosed in D2, but to a computer system for controlling hydro/mechanical tools. Secondly, in the system of D2, a transmission voltage of typically 11-36 kV is transformed down to a distribution level of typically 3-12 kV and thus the switches of D2 are high-voltage switches. D6 is not concerned with the protection of such switches, which are known to be pressure tolerant, but instead with the protection of pressure-sensitive electronic components such as timing or frequency elements (page 6, lines 9 to 20), which are not used in D2.

## **Reasons for the Decision**

1. Interpretation of claim 1
  - 1.1 Before turning to the questions of added subject-matter, novelty and inventive step, it is necessary to construe the feature "pressurised casing", as used in claim 1.
  - 1.2 A pressurised vessel or container is normally a closed container in which the pressure is maintained at a desired level, independently of the ambient pressure. Claim 1 defines subsea pressurised casings enclosing electrical components. In this context, the skilled reader knows that sea water pressure increases by about 1 bar for every 10 meters of depth, amounting to about 300 bars at a sea depth of 3000 m, and that some electrical components, such as those of control systems, are pressure vulnerable. Thus, the skilled reader is aware of the need to protect some electrical components from high ambient pressure so that reliable operation is possible. Hence, in the context of claim 1 and in the absence of any other specific indication in claim 1, the skilled reader understands that the term "pressurised casing" defines a casing in which the pressure is kept at a relatively low level, even at the high ambient pressure of deep sea waters.
  - 1.3 In the communication pursuant to Article 15(1) RPBA, the Board informed the parties of its provisional opinion that the term "pressurised casing" should be interpreted as indicated above. In response the parties neither commented nor disputed this interpretation, and the Board sees no reason to depart from this opinion.

2. Claim 1 - Articles 100(c) and 123(2) EPC

2.1 The subject-matter of claim 1 corresponds to that of dependent claim 15 as granted, when read in combination with claim 1 as granted.

2.2 It corresponds essentially to the subject-matter of claim 1 as originally filed, when read in the light of the description and drawing.

2.3 "Encapsulating" and "being encapsulated"

The terms "encapsulating" and "being encapsulated" as used in claim 1 are directly and unambiguously derivable from the application documents as originally filed. Reference is made to the terms "external pressurised casing", "external pressure casing", "internal pressurised casing" and "internal pressure casing" in the definition of the invention in claim 1, on page 2, lines 4 to 19 and on page 9, lines 22 to 31, and also to the preferred embodiment as illustrated in the drawing and described on page 7, line 27 to page 8, line 6.

2.4 "Two-stage pressure system"

It is undisputed that the expression "two-stage pressure system" was originally disclosed only for a preferred embodiment wherein the second pressurised casing is filled with a "fluid" and the first pressurised casing is "filled at least partly with a gas or a mixture of gases" (see the paragraph bridging pages 7 and 8 of the application as published).

However, a skilled reader of the application as filed using common general knowledge would readily recognise that the provision of a two-stage pressure system has no functional or structural relationship with the other features mentioned in the paragraph bridging pages 7 and 8 and that these other features are in fact not essential for achieving a two-stage pressure system (see page 1, line 24 to page 2, line 2 of the application as published). Indeed, it is clear that a two-stage pressure system is achieved by virtue of the second pressurised casing being encapsulated within the first pressurised casing, whatever the type of medium filling these nested casings. This understanding accords with the general teaching on pages 2 and 3 as filed that the nested arrangement of pressurised casings allows "a two-stage pressure compensation" (page 2, lines 18 and 19), while the filling of the respective casings with a "liquid" or "gas" is only an optional measure to achieve further advantages (page 2, line 27 to page 3, line 7).

Hence, it is admissible under Article 123(2) EPC to isolate the expression "a two-stage pressure system" from the afore mentioned combination of features as originally disclosed and to introduce it in claim 1 (see Case Law of the Boards of Appeal of the EPO, 7th edition 2013, II.E.1.2).

## 2.5 "Cable for power transmission"

Claim 1 requires that the subsea system is "connectable to at least one cable ... for power transmission from the power source to the subsea system". This cable feature is directly and unambiguously derivable from the application as originally filed (see in particular



the general disclosure of a power cable on page 6, lines 11 to 19).

In the illustrated embodiment, the electrical power system comprises a topside converter 2 for converting the lower frequency power of a topside power system 3 to a high frequency, whereby the subsea system 10 is connected to this converter via a power cable 9. However, for a skilled reader it is apparent that these other features only represent advantageous features of the power cable 9 transmitting power from a power source to the subsea system 10.

2.6 In summary, the Board considers that the subject-matter of amended claim 1 does not extend beyond the content of the application as originally filed (Article 100(c) EPC) and that the amendments made in the opposition proceedings meet the requirements of Article 123(2) EPC.

### 3. Consideration of D8 in the proceedings

3.1 D8 was filed for the first time in the appeal proceedings by the appellant with its statement of grounds of appeal. Even though D8 was cited in the search report, it does not automatically form part of the appeal proceedings.

3.2 The appellant explained that D8 was introduced as support, in addition to D2, D5 and D6, of the argument that it is generally known in the relevant field to use a two-stage pressure system as defined in claim 1 of the main request, in order to protect electrical components from high levels of ambient pressure.

3.3 The Board notes that D8 was available to the appellant at the time of filing its opposition, since D8 had been cited in the search report. In addition, as mentioned above, the subject-matter of claim 1 of the main request corresponds to that of claims 1 and 15 as granted. Thus, D8 could and should have been filed in the opposition proceedings, within the opposition period or at the latest in response to the filing of the respondent's main request, well in advance of the oral proceedings before the Opposition Division. In conclusion, the filing of D8 with the grounds of appeal was not in due time but late.

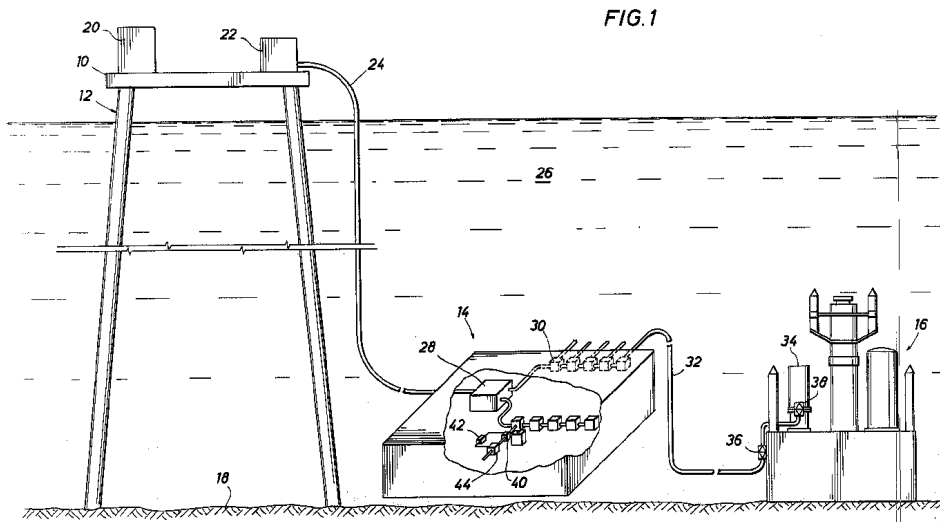
3.4 D8 neither relates to subsea power distribution, nor does it disclose a pressurised casing for protecting an electrical or electronic component against high ambient pressure in deep seawater. Hence, D8 is *prima facie* no more relevant than D2, D5 or D6 and thus it is highly unlikely to play a role in overturning the decision under appeal.

3.5 For these reasons, the Board decided not to take D8 into consideration (Article 114(2) EPC and Article 12(4) RPBA).

4. Claim 1 of main request - Novelty over D5

4.1 Figure 1 of D5 (see below) shows a subsea petroleum installation that includes a platform 10 positioned above the ocean surface on top of a tower 12, a subsea distribution manifold 14 and a subsea wellhead assembly 16. An electrical power source 22 is located on the platform 10 for supplying electrical high voltage power to the distribution manifold 14 via an electrical cable 24. The distribution manifold 14 is designed to service simultaneously ten wellhead

assemblies 16, in particular to provide electrical power to them. To this end, manifold 14 contains a power transformer 28 and ten feeder couplers 30. The transformer is connected to electrical cable 24 for receiving the high voltage power from electrical power source 22, and distributes a lower voltage to feeder couplers 30, each coupler 30 supplying electrical power to a separate wellhead assembly 16 via a power cable 32 (column 6, line 37 to column 7, line 2). D5 teaches that a current-limiting device is mounted near the power input end of the power cable, at the manifold, to limit the current in the power cable and to protect the coupler when it becomes disconnected (column 3, lines 35 to 56). Figure 1 shows that a current-limiting device consisting of a current sensing circuit 40, a control logic circuit 42 and a protector circuit 44, which are mounted near the end of power cable 32 and within the distribution manifold 14 (column 7, lines 20 to 27). D5 teaches that, although circuits 40, 42 and 44 are illustrated separately in Figure 1, they may be contained within a hermetically sealed package with the secondary of feeder coupler 30 (column 7, lines 34 to 40). Preferably, these circuits are mounted within the power cable 32, at its power input end (see column 7, lines 30 to 33 and 41 to 60 together with Figure 2).



4.2 The parties dispute whether distribution manifold 14 is an external pressurised casing and whether circuits 40, 42 and 44 are encapsulated in an internal pressurised casing.

4.3 Is distribution manifold 14 an external pressurised casing?

4.3.1 Figure 1 of D5 is a simplified pictorial representation of a subsea petroleum installation, wherein distribution manifold 14 is represented as a functional block. It cannot be derived from D5 that distribution manifold 14 is a casing, let alone a pressurised casing, encapsulating transformer 28, feeder couplers 30 and circuits 40, 42 and 44. In fact, D5 does not mention any casing, housing, enclosure or the like to protect electrical components from ambient pressure.

4.3.2 The appellant argues that distribution manifold 14 is implicitly a pressure casing, because it is submerged several hundred feet or more in the water (column 6, lines 37 to 39) and it must protect its pressure-

sensitive electrical content from the high ambient pressure. The Board is not convinced. In D5, transformer 28 supplies 440 V power to each wellhead assembly 16 via coupler 30 and circuits 40, 42 and 44 (column 6, line 57) and there is no hint that transformer 28, couplers 30 and/or circuits 40, 42 and 44 are pressure-sensitive or may need a protection against ambient pressure. Although the skilled person knows that some electronic components must be protected from high levels of ambient pressure in deep sea waters, i.e. in water depths deeper than 1000 meter (see e.g. D6, page 6, lines 17 to 19), D5 does not disclose any such sensitive electronic components. In addition, using common general knowledge, the skilled person recognises that the installation described in D5 is adapted only for shallow waters, since the tower 12 is secured to the sea bottom 18. In such shallow waters, there is no need to protect the electrical components of D5 against ambient pressure.

- 4.3.3 As reasoned by the respondent, the teaching of D5 is that feeder couplers 30 may become accidentally or purposefully disconnected, such as when power cable 32 is disconnected from a wellhead assembly 16 to be used on a different wellhead assembly, or when a portion of the electrical equipment is disconnected and removed for repair, service or replacement (column 2, lines 8 to 24). The entire thrust of D5 is that a current-limiting device should be provided to allow the coupler to be safely disconnected without overheating and damaging it (column 3, lines 35 to 39; column 7, lines 56 to 60; column 12, line 60 to column 13, line 4). It is thus implicit that distribution manifold 14 must allow access to men or equipment working in the subsea environment, so that couplers 30 can be disconnected and connected.

4.3.4 In addition, it is taught in column 6, lines 40 to 45 of D5 that distribution manifold 14 is "typically designed to simultaneously service several subsea petroleum recovery installations", e.g. several wellhead assemblies 16, and that it "therefore often contains control modules (not shown) which monitor various functions within the subsea petroleum installations". From this and the fact the feeder couplers 30 must remain accessible for connection/disconnection, the skilled person understands that the term "distribution manifold" simply defines a typical assembly of control modules and electrical components, such as couplers 30, transformer 28 and circuits 40, 42 and 44, whereby, as is usual in the art, the control modules and the electrical components are contained within the outline of the assembly, and not necessarily in a pressurised container or casing.

4.4 Are circuits 40, 42 and 44 encapsulated in internal pressurised casing(s)?

4.4.1 It cannot be derived from D5 that circuits 40, 42 and 44 are encapsulated in one or more dedicated pressurised casing(s), even though the circuits are schematically represented as functional boxes in Figure 1.

4.4.2 D5 does teach that circuits 40, 42 and 40 may be "physically arranged in one unit", for example "all be contained within a hermetically sealed package" (column 7, lines 34 to 40). However, when reading this passage in context, it is apparent that the function of the hermetically sealed package is to protect the circuits from the subsea environment, i.e. to exclude seawater ingress and protect the circuits

against moisture and corrosion (see column 8, lines 3 to 5, column 1, lines 57 to 62 and column 2, lines 1 to 3). This does not imply that the hermetically sealed package is an internal pressurised casing to protect the circuits against high ambient pressure. In fact, as explained above, D5 neither discloses pressure-sensitive electronic components nor does it relate to a power distribution system in deep sea waters wherein there is need to protect such components against high ambient pressure.

4.5 The appellant also submits that it is apparent from Figure 1 that transformer 28 and feeder couplers 30 are enclosed in dedicated pressurised casings. The Board is not convinced for the reasons already given above with respect to the manifold and circuits. In particular, the mere fact that transformer 28 and couplers 30 are all represented as functional boxes in Figure 1 does not mean that they are enclosed in casings.

4.6 In conclusion, the subject-matter of claim 1 is novel over D5 because D5 fails to disclose the following features of the claim:

- that a first pressurised casing is provided for the subsea power distribution system;
- that at least one internal second pressurised casing is provided for at least one electrical functional component;
- that a first pressurised casing encapsulates the subsea power distribution system and that at least one second pressurised casing is encapsulated within the first pressurised casing; and
- that the first pressurised casing and the second pressurised casing are arranged in a two-stage pressure system.

5. Claim 1 of main request - Inventive step
- 5.1 Inventive step when starting from D5
  - 5.1.1 The appellant submits that the subject-matter of claim 1 lacks an inventive step in the light of D5 in combination with common general knowledge, or alternatively in combination with D6.
  - 5.1.2 Lack of inventive step in respect of D5 alone was raised in the notice of opposition and has been discussed in the decision under appeal. The appellant argued lack of inventive step with respect to D5 and D6 for the first time in the statement of the grounds of appeal. Since this argument is a development of the inventive step issue and it does not raise any new complex matters, the Board decided to take it into consideration (Article 114(2) EPC and Article 12(4) RPBA).
  - 5.1.3 As set out under point 4 above, D5 fails to disclose first and second pressurised casings as defined in claim 1, which provide a two-stage pressure barrier against ambient pressure.
  - 5.1.4 A skilled person would not provide the system of D5 with these distinguishing features, because it does not comprise a pressure-sensitive electrical component requiring protection against high ambient pressure, and because it is used for subsea installations in shallow waters where ambient pressure is less of a problem. Moreover, even if the skilled person wished to protect the electrical components of the distribution manifold of D5 against ambient pressure, he would not enclose them in an external pressurised casing, because this would render the feeder couplers 30 inaccessible for



connection/disconnection and thus run contrary to their function. Hence, the claimed subject-matter is not obvious when starting from D5.

5.1.5 The appellant contends that the features distinguishing claim 1 from D5 are rendered obvious by the teaching of D6. The Board disagrees for the following reasons.

5.1.6 Firstly, starting from the subsea power distribution system of D5, the skilled person has no reason to consider D6 as it does not relate to a subsea power distribution system, but rather to a computer control system for subsea servicing or operation of hydro/mechanical tools (e.g. see claim 1 of D6). In addition, the power distribution system of D5 is designed to be used in shallow waters, while D6 is concerned with hydro/mechanical tools used in much deeper waters, with ambient pressures beyond 10 bar and up to 1000 bar above atmospheric pressure (see D6, page 1, line 17; page 3, line 6; page 7, line 8).

5.1.7 Secondly, the electrical components of D5 and D6 are completely different. Those of D5 are for transmitting 440 V power to the wellhead assemblies, whereas D6 is concerned with components for a computer control system, such as timing or frequency elements, e.g. quartz crystals, ceramic resonators, atomic sources or monolithic oscillator systems (see D6, page 6, lines 11 and 12). Hence, the skilled person would not consider applying the teaching of D6 to the components of D5.

5.1.8 Thirdly, it is the gist of D6 that the small pressure-sensitive electronic components be protected by being housed in dedicated micro pressure vessels instead of a single, large and heavy external pressurised casing (page 2, lines 10 to 13 and page 6, line 21 to page 7,

line 13). D6 insists that larger pressure-insensitive electrical components (such as those disclosed in D5) be excluded from pressure protection (paragraph bridging pages 4 and 5 and paragraph bridging pages 11 and 12). Figure 3 of D6 shows how small pressure-sensitive components are maintained at atmospheric pressure within a micro-pressure vessel 12 which, together with pressure-insensitive components, is located in a controlled environment at high ambient pressure or even at a slight overpressure in order to prevent entry of moisture (page 11, lines 10 to 23). Thus, D6 teaches away from a nested arrangement of pressurised casings as defined in the claim at hand.

5.1.9 In conclusion, the subject-matter of claim 1 involves an inventive step in the sense of Article 56 EPC when starting from D5.

5.2 Inventive step when starting from D2

5.2.1 D2 discloses a system for distribution of electric power between a transmission system and local consumers in a subsea environment. It includes a transformer arranged in a first chamber 20 and a distribution unit, which is arranged in a second chamber 30. The distribution unit is connected to the transformer and comprises connections 33 for connecting the distribution system to the consumers (see Figure 2 below). The transformer and the distribution unit are combined into a single module 40, which comprises a first volume compensation device 22 for equalising the pressure between the first chamber 20 and the second chamber 30, and a second volume compensation device 34 for equalising the pressure between the second chamber 20 and the ambient seawater pressure. Chamber 30 serves as an additional barrier against the ingress of

seawater surrounding module 40, thereby eliminating the need for a double tank design of the transformer housing (page 2, lines 30 to 32). D2 does not disclose an electrical functional component, e.g. a switch or a part of it, encapsulated in a pressurised casing, which itself is encapsulated in chamber 30.

5.2.2 Contrary to the appellant's view, it cannot be derived from D2 that chamber 30 forms a pressurised casing in the sense of claim 1. Indeed, compensation devices 22 and 34 equalise the pressure in chambers 20 and 30 and the ambient sea water pressure (page 5, lines 20 to 26), so as to avoid sea water from leaking into the chambers and damaging the electrical components (page 1, lines 13 to 28).

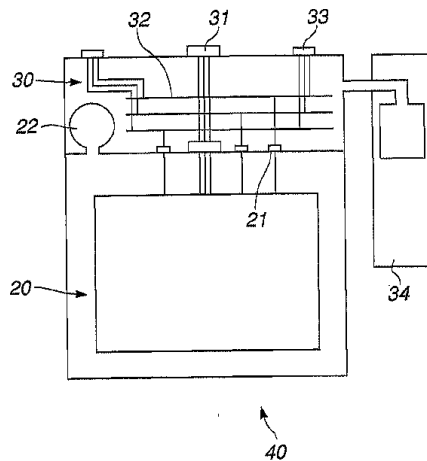


Fig. 2

5.2.3 Thus, as with D5, D2 fails to disclose first and second pressurised casings as defined in claim 1, which provide a two-stage barrier against ambient pressure.

5.2.4 The appellant submits that these features would be rendered obvious by the teaching of D6. The Board disagrees for the reasons already given when starting from D5 (see points 5.1.6 and 5.1.8 above). The

switches mentioned on page 7 of D2 are designed to switch voltages between 3 kV and 12 kV and there is no hint that these high voltage switches are pressure-sensitive. The skilled person has no reason to consider from the teaching of D6 that small pressure-sensitive electronic components of a computer system for controlling tools, such as timing/frequency elements, can be encapsulated in micro pressure vessels and to apply this teaching to the high voltage switches of D2. Finally, neither D2 nor D6 discloses a nested arrangement of pressurised casings as defined in claim 1.

- 5.2.5 In conclusion, the subject-matter of claim 1 involves an inventive step in the sense of Article 56 EPC when starting from D2.
6. The above reasoning applies to the subject-matter of independent method claim 19 of the main request as well as that of the dependent claims of this request.
7. The Board thus agrees with the Opposition Division that the patent amended according to the respondent's main request meets requirements of the EPC.
8. Under these circumstances, there is no need to consider the auxiliary requests of the respondent.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:



C. Spira

G. Ashley

Decision electronically authenticated