Neutral Citation Number: 2016 EWHC 2278 (Pat)

CLAIM NO: HP 2015-000019

IN THE HIGH COURT OF JUSTICE
CHANCERY DIVISION
PATENTS COURT

Rolls Building
110 Fetter Lane,
London
EC4A 1NL

Date: 16 September 2016

Before:

MR DANIEL ALEXANDER QC

- -

Sitting as a Deputy High Court Judge

BETWEEN:-

(1) METER-TECH LLC
(2) VANCLARE SE LLC
Claimant

- and -

BRITISH GAS TRADING LIMITED
Defendant

AND BETWEEN:-

BRITISH GAS TRADING LIMITED
Part 20 Claimant

- and -

VANCLARE SE LLC
Part 20 Defendant

- -

Mr Hugo Cuddigan QC and Mr Christopher Hall (instructed by Williams Powell) appeared for Meter-Tech LLC and Vanclare SE LLC

Mr Roger Wyand QC and Mr Richard Davis (instructed by Mathys & Squire LLP) appeared for British Gas Trading Limited

Hearing dates: 5-6 May 2016, 9-10, 12-13 May 2016

Approved Judgment

I direct that, pursuant to CPR PD39A para 6.1, no official shorthand note shall be taken of this Judgment and that copies of this version as handed down may be treated as authentic.

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Daniel Alexander QC

Mr Daniel Alexander QC

INTRODUCTION

The case in a nutshell

1. This is an action for revocation and alleged infringement of UK Patent GB 364 420 ("the Patent") concerning so-called "smart meters". It is, in substance, about whether British Gas ("BG") should pay the claimants ("Meter-Tech", in which term I include Vanclare SE LLC, "Vanclare", the proprietor of the Patent) royalties in respect of BG's past, current and proposed smart meter systems.

2. Meter-Tech is the exclusive licensee of the Patent, which is entitled "A prepayment utility metering system", with a filing date of 22 May 2000. There is no claim to earlier priority. The Patent was bought from the administrators of its former proprietor Secure Electrans Limited.

3. Meter-Tech contends that it has a valid patent which covers those BG systems and says that the claim for infringement is significant because it potentially affects, among other things, a £600 million contract for the installation of up to 16,000,000 smart meters throughout the United Kingdom. Meter-Tech values the claim at in excess of £10 million although it (or more strictly Vanclare) appears, from the correspondence, to have purchased the Patent as well as a number of other rights in 2014 for a much more modest sum (£160,000). There is material in the correspondence referring to it as a "£30 million infringement claim".

4. The case focusses commercially on BG's current installed and proposed systems since the historic systems were not rolled out in significant quantities.

5. The Patent and the prior art is not complex. The central important issue may be (somewhat tendentiously but not unfairly) summarised as follows. Was it inventive, at the filing date of the Patent, to adopt and use a number which uniquely identifies a specific meter for directing a pre-payment to the right meter in a wireless system which requires the unique identification of that meter for that purpose? For reasons given in greater detail below, I consider that it was not inventive and have formed the view that the key claims of the Patent are invalid.

6. However, since its inception, the case has grown to encompass a large number of other points, some on infringement, relating to the various systems, including questions of experimental use. The dispute has generated multiple questions of construction and multiple sub-arguments on validity. As Meter-Tech says, there are now "very many" issues.

7. That may be partly because of the nature of the case it has advanced against BG. This is not a case in which there is a standards body to which patentees submit allegedly standards essential patents and give undertakings to grant licences to others on FRAND terms. As Birss J said in an earlier judgment concerning adjournment of the trial, it is not a conventional standards essential patents case. On Meter-Tech's pleaded case, BG is facing a threat of disruption to an important national roll out and may have not felt justified in leaving any art uncited, or any argument unmade, in defence of its position. Equally, Meter-Tech has sought to advance quite complex points on construction to try to limit the claims to avoid the prior art and common general knowledge.

Parties and relevant procedural history

8. The proceedings were originally commenced in IPEC as a claim for revocation of the Patent by British Gas Services Limited. Meter-Tech issued a claim for infringement in the High Couty against British Gas Trading Limited, together with an application to transfer the IPEC invalidity proceedings to the High Court. That case was transferred to the High Court by order of Mr Justice Arnold on 17 June 2015 (see [2015] EWHC 2087 (IPEC)) and the proceedings consolidated. Upon that application, BG had contended that the issue of validity should be determined first and separately from the issue of infringement. Arnold J did not agree and ordered the case to proceed as an ordinary infringement action with both infringement and validity in issue. He gave directions to trial, including provision for amended statements of case from both sides. Those were to include a statement of case as to the essentiality of the Patent, setting out its alleged relevance to the UK Department of Energy's Smart Metering Implementation Programme.

9. In the event, it has been agreed that all matters concerning alleged essentiality as well as any other relief should be determined at a separate hearing.

10. In his judgment on that occasion, Arnold J also said that the arguments on validity were not of particular complexity but that it would not be safe to conclude at that stage that BG had anything approaching an unanswerable case. His view was that BG was realistic to recognise that the claims would require a trial for their proper resolution even though BG maintained that the claims were, in its words, "hopelessly invalid".

Issues on the pleadings

The statements of case

11. Statements of case on infringement and validity have been provided. These are useful but the lengthy expert evidence in the case has developed the points made in the statements of case considerably further. Meter-Tech contended that BG was, in effect, confined to its statements of case and where, for example, it had suggested that the identifier which would be natural to use was in particular the MPxN (as to which see further below) that

was inconsistent with its case developed at trial that the meter serial number (MSN) or some other unique location identifier specific to the meter would have been obvious.

12. While I have considered these statements of case, including what they do not say, a case of this kind must be determined by reference to the evidence given at the trial. Some forensic mileage can be made by pointing to the fact that a case advanced at trial was not put forward or not developed in a statement of case at an earlier stage of the proceedings but it would make little sense if, instead of such statements of case standing as documents to assist the parties in the preparation of their cases, they became instruments which preclude the court from deciding the case on the evidence actually given.

13. Specifically on the point about the MPxN, BG explained that the point made relating to that identifier in its statement of case on validity was because it was thought that Meter-Tech was contending that the identifier in question had to identify specifically the *geographical* location of the meter (which the MPxN could be said to do) rather than identify the meter itself. Since it is now clear that this is not Meter-Tech's case and the focus is much more on identification of the specific meter as opposed to the premises, other identifiers of the meter themselves are more naturally considered. Thus the case developed by BG, which was not framed as limiting, has reasonably responded to the way in which Meter-Tech's approach to the Patent has developed.

14. In the event, neither side adhered rigidly to the statement of case or its own opening skeleton argument at trial. In my judgment, this is a case which must be determined by the evidence taken as a whole and the arguments as they were ultimately refined. I am not satisfied that there was any material departure from the parties' statements of case. The evidence and argument developed these but was not inconsistent with them.

The argument based on obviousness over common general knowledge alone

15. There is, however, one aspect where greater caution is required, namely the case advanced of alleged obviousness over common general knowledge alone.

16. Meter-Tech points to the fact that BG's pleaded case in this respect amounted simply to a statement of what it contended the common general knowledge was and not why such rendered the relevant claims obvious. It differed materially from the detailed particulars given for the case of obviousness over the specific prior art citations, for which BG set out, in each case, what the prior art document was alleged to disclose, by reference to the integers of the claims, how they differed from the patent on various constructions and why the subject matter of the claim was obvious.

17. Meter-Tech contended that it would be unfair to permit BG to develop a case based on common general knowledge alone which was not foreshadowed by the pleadings although it did not go so far as to seek to strike out all of the evidence on this issue. That, so Meter-Tech argued, was particularly the case because arguments based on common

general knowledge alone are more susceptible to hindsight by ignoring inconvenient features of actual prior art references.

18. I think there is force in this aspect of Meter-Tech's argument. That is partly because of the care with which "common general knowledge alone" arguments need to be treated, as the authorities relating to this issue show. Three extracts from the leading judgments merit comment.

19. First, in *Ratiopharm GMBH v NAPP Pharmaceutical Holdings Ltd* [2008] EWHC 3070 (Pat), Floyd J drew attention to the difficulties in addressing common general knowledge. In a familiar passage, which is cited in full since it also sets out the approach adopted below to determining what is common general knowledge, he said:

> 154. The rules of pleading in patent actions require a party to identify the matter in the state of the art which is relied on to support of an attack on the ground of obviousness: see CPD Part 63 PD 11.3(1) and 11.4(1). Notwithstanding that provision, it has been the practice for allegations of obviousness to include a plea founded on nothing other than "common general knowledge". Sometimes, as here, these allegations reach trial without any further particularisation of the plea, except to the extent that the plea has been explained by the expert evidence adduced in support of it. I consider that the time has come when the matter which is said to be common general knowledge ought to receive some more formal exposition in advance of the expert evidence stage. Apart from anything else, the *Pozzoli* approach, which depends on identifying a difference between matter alleged to form part of the state of the art and the inventive concept, cannot begin to be applied without adequate particularisation of the starting point.
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> 155. There are a number of things to note about the plea of obviousness based on common general knowledge. The first is self-evident: it is that it is essential that the starting point for the plea is indeed established to be common general knowledge. If the matter alleged to be common general knowledge is not established as such then the result is just the same as if a documentary starting point is not shown to have been published before the priority date: the attack based on it is likely to fail.
>
> 156. The second point is that it is important to be precise about what it is that is asserted to be common general knowledge. For example, in the present case it is admitted that "the existence of oxycodone" was common general knowledge. But the dispute here is not about whether a skilled person knew about oxycodone. The real dispute is about what oxycodone was used for. If the skilled person has not used oxycodone as an alternative to morphine for oral administration for moderate to severe pain, it becomes difficult to argue that it would occur to him to use oxycodone in the course of deciding on a controlled release formulation for use in such circumstances.

157. Thirdly, it is vital to have in mind the requirements for matter to be part of the common general knowledge. In *Beloit Technologies Inc v Valmet Paper Machinery Inc* [1997] RPC 489 at pages 494-495, Aldous LJ put it in this way:

"It has never been easy to differentiate between common general knowledge and that which is known by some. It has become particularly difficult with the modern ability to circulate and retrieve information. Employees of some companies, with the use of libraries and patent departments, will become aware of information soon after it is published in a whole variety of documents; whereas others, without such advantages, may never do so until that information is accepted generally and put into practice. The notional skilled addressee is the ordinary man who may not have the advantages that some employees of large companies may have. The information in a patent specification is addressed to such a man and must contain sufficient details for him to understand and apply the invention. It will only lack an inventive step if it is obvious to such a man.

It follows that evidence that a fact is known or even well-known to a witness does not establish that that fact forms part of the common general knowledge. Neither does it follow that it will form part of the common general knowledge if it is recorded in a document. As stated by the Court of Appeal in *General Tire & Rubber Co. v. Firestone Tyre & Rubber Co. Ltd.* [1972] R.P.C. 457, at page 482, line 33:

> "The two classes of documents which call for consideration in relation to *common general* knowledge in the instant case were individual patent specifications and widely read publications'. As to the former, it is clear that individual patent specifications and their contents do not normally form part of the relevant *common general* knowledge, though there may be specifications which are so well known amongst those versed in the art that upon evidence of that state of affairs they form part of such knowledge, and also there may occasionally be particular industries (such as that of colour photography) in which the evidence may show that all specifications form part of the relevant knowledge.

As regards scientific papers generally, it was said by Luxmoore, J. in *British Acoustic Films* (53 R.P.C. 221 at 250):

> "In my judgment it is not sufficient to prove common general knowledge that a particular disclosure is made in an article, or series of articles, in a scientific journal, no matter how wide the circulation of that journal may be, in the absence of any evidence that the disclosure is accepted generally by those who are engaged in the art to which the disclosure relates. A piece of particular knowledge as disclosed in a scientific paper does not become common general knowledge merely because it is widely read, and still less because it is widely circulated. Such a piece of knowledge only becomes general knowledge when it is generally known and accepted without question by the bulk of those who are engaged in the

> particular art; in other words, when it becomes part of their common stock of knowledge relating to the art."

And a little later, distinguishing between what has been written and what has been used, he said:

> "It is certainly difficult to appreciate how the use of something which has in fact never been used in a particular art can ever be held to be common general knowledge in the art."

Those passages have often been quoted, and there has not been cited to us any case in which they have been criticised. We accept them as correctly stating in general the law on this point, though reserving for further consideration whether the words 'accepted without question' may not be putting the position rather high: for the purposes of this case we are disposed, without wishing to put forward any full definition, to substitute the words 'generally regarded as a good basis for further action'."

158. Fourthly, allegations of obviousness in the light of common general knowledge alone need to be treated with a certain amount of care. They can be favoured by parties attacking the patent because the starting point is not obviously encumbered with inconvenient details of the kind found in documentary disclosures, such as misleading directions or distracting context. It is vitally important to make sure that the whole picture presented by the common general knowledge is considered, and not a partial one.

159. Finally, the common general knowledge does not include knowledge which does not inform the skilled person's approach from the outset. As Kitchin J said in *Generics (UK) v Daiichi Pharmaceutical* [2008] EWHC 2413 (Pat):

> "I can readily accept that, faced with a disclosure which forms part of the state of the art, it may be obvious for the skilled person to seek to acquire further information before he embarks on the problem to which the patent provides a solution. But that does not make all such information part of the common general knowledge. The distinction is a fine one but it may be important. If information is part of the common general knowledge then it forms part of the stock of knowledge which will inform and guide the skilled person's approach to the problem from the outset. It may, for example, affect the steps it will be obvious for him to take, including the nature and extent of any literature search."

Whether knowledge is common and general depends on the considerations explained by Aldous LJ in *Beloit*. If information does not satisfy that criterion, it does not become common general knowledge by postulating a set of steps that the skilled team might take to find it if they had already embarked on an attempt to solve a particular problem. That is not to say that it is illegitimate, in assessing an obviousness attack, to take

account of material which would inevitably be found and treated as reliable in consequence of a step or steps which it is obvious to take. If the material so found is such as would be accepted, then it may assist in showing obviousness of a further step. But what it cannot be used for is in support of an argument that the series of steps being undertaken were obvious from the start."

20. One of the important points made in that judgment is that it is necessary for the court to evaluate not merely whether a given product or feature of the art was well known to the skilled person but what it was well known to be useful for.

21. Second, in *Accord Healthcare Ltd v Medac Gesellschaft Für Klinische Spezialpräparate Mbh* [2016] EWHC 24 (Pat), Birss J said:

"120. Before leaving the argument based on common general knowledge alone, I will mention the words of Floyd J (as he then was) in ***Ratiopharm v Napp*** [2008] EWHC 3070 (Pat) at paragraphs 155-159 and in particular the passage at paragraph 158 which warns that such attacks need to be scrutinised with care since they can be favoured by parties because the starting point is not obviously encumbered by inconvenient details of the kind found in documentary disclosures. I respectfully agree with Floyd J. Since it seems to me that this case provides a good example of the problems identified in ***ratiopharm*** I will add a few words of my own.

121. Normally the person attacking validity will rely on a particular concrete document or well defined prior use as a starting point. The fact that such a concrete item of prior art may be part of the common general knowledge is not the point. That is different from an attack based on common general knowledge alone.

122. Many inventions involve a combination of known features. However a combination of features, all of which individually were common general knowledge, can give rise to a valid patent claim if that combination is new and non-obvious. Patent trials are inevitably ex post facto and a key problem is to identify and avoid hindsight. Combinations of features can pose a particularly acute hindsight problem. The thing about concrete items of prior art, whether they are prior published documents or prior used products or processes, is that whatever combination of features that concrete prior art consists of, is not one which was created with hindsight knowledge of the invention.

123. The problem with arguments over common general knowledge alone is that the combination of features relied on is always and necessarily one created with hindsight knowledge of the invention, and worse, is one which the person attacking validity has not been able to find as a pre-existing combination in the concrete prior art. If they had they would have relied on that concrete prior art. Either the combination has not been made in the concrete prior art at all or it only appears with additional inconvenient details. If an invention is not obvious over the concrete prior art which is relied on, the

court is entitled to be sceptical that an argument that it is nevertheless obvious over common general knowledge alone is correct.

124. The problem is illustrated in this case. Sometimes an invention belongs to a field which is not well documented but in this case Accord did not lack possible starting points. It has pleaded two documents and could easily have pleaded others, such as the existing SmPCs for subcutaneous methotrexate. However the documents contain what might have been thought of as "inconvenient" details. Russo does not mention subcutaneous administration by name and is aimed at JCA rather than RA. Russo is also a small study and was published six years before the priority date. Jansen does mention subcutaneous and is for RA but it does not mention pain and contains the two statements referred to above which Medac relies on. That the "inconvenient" details in Russo have not led to a finding of non-obviousness is not the point. To invent as a starting point in the prior art an amalgam of the best bits of the two cited documents while leaving out the inconvenient aspects, which is in effect what the argument was, created a combination which did not hitherto exist."

22. Those observations are particularly apposite where the case on obviousness over common general knowledge has not been set out in a statement of case, despite an order to do so. There is an important difference between a pleading of the alleged common general knowledge and a pleading of why a given claim is said to be obvious in the light of it. If it is said that a claim to A+B is obvious because both A and B are part of the common general knowledge, the mere fact that they are proven to be common general knowledge at the priority date does not, of itself, render the combination A+B obvious. In some cases, that may itself be evidence that the combination A+B was not obvious (if, for example, both A and B had been well known for many years and no-one had thought to combine them in that way).

23. An additional need for caution with these arguments arises because there is sometimes a dispute as to whether matter, even if common general knowledge, would have been known to the relevant skilled team (rather than some other skilled person or team).

24. Invention can sometimes lie in bringing knowledge which is common to one field together with knowledge common to another related or different field. There is therefore some incentive for epistemic salami-slicing with respect to the skilled person or team on the side of a patentee which is driven to admit that something was common general knowledge, then seeks to define the relevant skilled team for the patent so specifically as to exclude or downgrade the matter in question from the knowledge of that team. Conversely, for an undertaking attacking the patent.

25. The court is then required to consider not only what was notionally widely known but by which, precisely defined, notional construct it was widely known. The difficulties of doing so reliably and reaching conclusions which are technically robust are compounded by the fact that the exercise of identifying specifically common general knowledge is

itself somewhat artificial, usually takes place many years after the relevant date, in circumstances which are rarely disinterested and are themselves often freighted with hindsight. This is therefore an area in which, through no-one's fault, evidence on each side can be prone to spin.

26. Third, in *Unwired Planet International Ltd v Huawei Technologies Co, Ltd & Ors* [2016] EWHC 576 (Pat), Birss J said of an argument based on common general knowledge at [233]:

> "…The argument in this case had not been properly pleaded. That is not the defendants' fault because the parties agreed to treat Mr Townend's first report as a statement of the case. However the case then shifted very close to trial, which demonstrated why it should have been pleaded properly in the first place. Furthermore the argument presented a combination of common general knowledge features which had been created with hindsight knowledge of the patent. It was presented in a way which lacked inconvenient details which were found when the same ideas appeared in the committee documents and it presented points of common general knowledge at a level of generality which itself was crafted with hindsight."

27. In that case, Birss J rejected the argument based on common general knowledge.

28. These authorities suggest that where a party is relying on obviousness over common general knowledge alone, it should set out in its statement of case, if ordered to provide one, not only what the common general knowledge is alleged to be but also how that differs from the invention of the patent and why such is said to render the claim in question obvious. That requires a pleading not of just the starting point but of the allegedly obvious route to the claimed invention so that the notional thinking of the skilled person can be seen and evaluated.

29. That said, in my view, the court should be careful not to place undue forensic weight on the precise manner in which such a pleading is done. Usually, such a case of obviousness over common general knowledge would be set out in a statement of case well before expert reports and the case may reasonably develop from them on the evidence. Parties should not, in my view, think that simply because a case was put in a particular way at one point in a statement of case, that it will invariably be used against them at trial because it is said that the case ultimately developed was slightly different. Inconsistency during the course of a case of the argument as to why a patent is obvious over common general knowledge may, on occasion, shed some light on whether the argument is sound and whether it was really obvious but the mere fact that such an argument develops somewhat in the light of the way that points are put by the patentee carries limited weight. I have therefore not given undue significance to the fact that BG's pleaded case based on the prior art was put slightly differently at trial from the way in which it was put in the statements of case and points made were given somewhat different emphasis (see above and the discussion of the points below).

30. However, there was no real pleading of obviousness over common general knowledge at all in this case. Instead, paragraphs 80-81 of the Amended Grounds of Invalidity set out a disparate group of facts alleged to be part of the common general knowledge and in my view the court is bound to consider whether, in those circumstances, it would be fair to permit such a case to be developed at trial. I return to this issue after considering the case on the individual prior art below.

Other procedural aspects

Other developments

31. Since the hearing before Arnold J, there has been an application to amend the Patent and the respective amended statements of case have sought to develop the infringement and invalidity argument. For the former, a case of joint liability for infringement by common design has been raised. For the latter, more prior art is now cited than was before Arnold J, following an application by BG to amend its statements of case in October 2015.

32. In the later judgment on adjournment of the trial ([2015] EWHC 3823 (Pat)), Mr Justice Birss made an adjustment to the timetable and it was re-listed for May 2016. The reason put forward by Meter-Tech for adjourning the case in 2015 was that they had identified what Birss J described as a "very serious problem" in continuing the case relying on the evidence of its then expert, a Mr Orchard, who, it was said, had an apparent hostility to British Gas. Birss J rejected Meter-Tech's application for a relisting in October 2016. I consider this issue briefly below in the evaluation of the expert evidence since Mr Orchard's draft report has been provided in disclosure.

Timing

33. The consequence of all these developments is that the case, which started life as a short, rapidly resolvable, single-item-of-prior-art invalidity case in IPEC has mushroomed into a major multi-million pound, multi-point infringement claim. It has included evidence of BG's trial programmes, details and disclosure by PPD and description of multiple systems. I offered to indicate to the parties somewhat earlier than delivery of a complete draft judgment what the disposition of the case would be, in general terms, in case that affected the parties' commercial plans. Meter-Tech declined that offer and indicated that it preferred to await the full draft and I therefore gave no such indication.

ISSUES

34. As the case has developed, there are six broad issues and multiple sub-points:
    a. Meter-Tech's title to sue.
    b. Construction.

c. Infringement. Four different systems are alleged to infringe. Two of these are said by BG to be historical and commercially unimportant, one is the system currently operated and the fourth is the system to be operated in the future, SMETS2, mandated under the Government's smart metering initiative known as SMIP (smart metering implementation programme). This issue also involves consideration of which undertaking is liable for infringement.
d. A defence of experimental use under s.60(5)(b) Patents Act 1977 is alleged in respect of the two historical systems and the system currently operated.
e. Validity, including (i) novelty (ii) obviousness over pleaded items of prior art and over common general knowledge and (iii) added matter. The claims in issue are 1, 5 and 11 (as granted and as proposed to be amended). Claim 5 is not alleged to be infringed but it is asserted to be independently valid.
f. Amendment of the patent. The amendment application is, in the main, said to be directed to making the key claims say expressly that which Meter-Tech contends they mean anyway.

35. Meter-Tech's opening skeleton identified 22 issues which arise for determination, of which several involve multiple sub-issues. A few have fallen away and in order to keep this judgment to reasonable length, I will deal with some of the points more briefly, focussing on the central issues.

WITNESSES

36. I shall mainly deal with the specific criticisms made of the witnesses' evidence under the various headings where they arise. The factual witnesses who dealt largely with the issue of BG's trials were not subject to any serious criticism. I deal with their evidence briefly below.

Expert witnesses

Meter-Tech's expert - Mr Pollock

37. Meter-Tech relied on the evidence of Mr Martin Pollock. In the 1970s, Mr Pollock gained a BSc with distinction from the University of Edinburgh in Architectural Studies, with Technical Maths, Civil Engineering, Architecture, Building Services, Metaphysics, and Theory of Design. That was followed by a Cert Ed, and Dip Ed in Human Intelligence, followed by 3 years teaching to gain full registration. In 1981, he took an HND Mechanical Engineering and he won the CCAT and IMechE Prizes. He began to work as a systems engineer in 1979. In 1989 he moved to Landis & Gyr, a utility meter manufacturer, as head of development. He then worked at Landis & Gyr until 1998, progressed to technical director, then to marketing & technical director, followed by sales and marketing director, and finally to head of the global payment systems strategic business unit. He gained extensive first-hand experience in the prepayment/Pay As You Go (PAYG) metering field.

38. In 1998, Siemens acquired Landis & Gyr's parent company and he became sales and marketing director of the newly formed British part of the process, known as Siemens Measurements Ltd., where he occupied senior roles focussing on the prepayment/PAYG metering field until around 2005. He has published widely and sat on various industry groups and committees.

39. BG criticised Mr Pollock, for not accepting points he should have accepted and for reading matter into the claims which was not there. It was said that he ought to have accepted sooner that digital cellular communication was an obvious method to employ at the priority date and that RF communication in the home was known or obvious and that two way communication was envisaged in some of the prior art documents. There is some force in these points and I deal with some of the evidence he gave demonstrating this below. However, these aspects of his evidence may have resulted from the manner in which he was instructed. Overall, I found his evidence of assistance as to the common general knowledge and what was known in the field at the time although at times it strayed into areas of doubtful relevance.

40. In general, he did his best to assist the court but, on the key aspect of the case, I found the reasons he gave for considering the main disputed integer of the main claims to be inventive to be inadequate. They were insufficiently focused on the actual claims and were in some respects lacking in reality. Nor did they seem to me to take into account all relevant aspects of common general knowledge. In certain important respects, he did not seriously maintain the views he had expressed in his written evidence, particularly with respect to the methods of communication which would have been obvious at the filing date and I have taken that into account in assessing his evidence as compared with the evidence of BG's expert.

BG's expert - Mr James

41. BG relied on the evidence of Mr Andrew James. Mr James read Natural Sciences at the University of Cambridge graduating in 1975. He received a Diploma in Computer Science also from the University of Cambridge in 1976.

42. He then worked in the Computing Planning and Development Department of the Central Electricity Generating Board and, while there, developed the software for two experimental meters. He then moved to SEEBOARD as First Engineer, partly on secondment as Senior Engineer to the Electricity Council on another advanced metering project. In 1989 he moved to Polymeters Response International Ltd which later became Secure Meters (UK) which manufactured solid state meters. He became Chief Scientist there and worked largely on meter development. He had extensive experience of meter design including specifically of pre-payment meters.

43. Mr James was, in my judgment, a careful, precise and modest witness with a wide and deep expertise in the subject. He too gave considerable assistance to the court although I have not in every respect followed his approach, particularly on the question of infringement. However, on the key issue upon which he gave evidence, his reasons for saying that the Patent was obvious seemed to me more cogent and soundly based than Mr Pollock's. I do not accept the criticism of him that he failed to answer straightforward questions. In my judgment, he was seeking to provide nuanced answers to questions which did not admit of a simple response.

44. Moreover, as he made clear, he looked at matters primarily to determine whether the invention was technically obvious at the filing date to a person skilled in the art, not whether particular energy suppliers would have had a strong motivation to adopt it at that date given the particular regulatory and market context. That accords with the approach required by the Patents Act 1977, whereas, in material respects, I found Mr Pollock's evidence to lack the appropriate perspective.

45. I do not accept that the criticisms made by Meter-Tech of his evidence on infringement and the positioning of the various parts of the BG systems in the depictions of them affected the overall credibility of his evidence.

46. Accordingly, where there was a real dispute of substance as to the approach a notional skilled person would have taken at the filing date, I generally prefer Mr James' evidence to Mr Pollock's.

TITLE TO SUE

47. I can deal with this briefly since the matter has been overtaken by events. Meter-Tech and Vanclare are Delaware companies, incorporated in late 2014. Vanclare owns the Patent in suit. BG put Meter-Tech to proof as to its right to sue although accepts that this "would be academic" if Vanclare were to be added as a co-claimant. That has now been done. The issue is said to have significance because of the implications for costs and damages which I will consider separately if necessary.

TECHNICAL BACKGROUND - PERSON SKILLED IN THE ART

48. There is no real dispute as to the characteristics of the person skilled in the art. Meter-Tech's expert, Mr Pollock, considered that such a person would have a degree in electronic or electrical engineering with extensive experience working in the utility metering industry with experience of standard communication techniques. BG's expert, Mr James, did not dispute this and added that such a person would be employed at a reasonably senior level by a meter manufacturer or utility company and would have up to date knowledge of pre-payment systems. In particular, he drew attention to the fact that while such skilled persons might be working at utilities, they would also be working at independent meter design companies. I accept that evidence.

49. I also consider that for the purpose of this case it is right to assume that the skilled person or team would notionally be working in the United Kingdom on developing a pre-payment metering system at the filing date albeit not necessarily a system for use in the United Kingdom or in the particular industry framework that obtained at the time. Thus the skilled team would not be confined to thinking about systems that would be acceptable in only that commercial context.

TECHNICAL BACKGROUND - COMMON GENERAL KNOWLEDGE

50. There was, ultimately, relatively limited dispute as to the key relevant points of common general knowledge.

Preliminary points on approach

51. The relevant material which would have been known or readily found out by the relevant skilled team at the filing date and which would have formed a sound basis for further action is as follows and combines the most important points from the evidence of both experts on which there was agreement.

52. Because of the argument advanced by Meter-Tech, I have included in this account material concerning the commercial position and the nature of the market referred to by Mr Pollock. This is not strictly common general knowledge in the sense in which this is traditionally understood in patent law. It is not technical knowledge. Nonetheless, I accept that this is information which, at a general level, may have informed part of the thinking of the skilled team, albeit that I have in what follows borne in mind that such a team is primarily concerned with technical considerations.

53. It was common ground that sources of common general knowledge in this area do not tend to be text books and there was no standard reference work at the filing date. However, it was common ground that the skilled team would keep up with relevant industry trends partly through attendance at international conferences. I am not satisfied that the material made available at such conferences was common general knowledge as such but for the reasons given below, that does not matter for this case, given the contents of the prior art and what is agreed to be common general knowledge.

54. In connection with this point, my impression of the evidence as a whole in this case is that this is a field of technology in which it is unlikely that everything which would have been thought about by manufacturers would be published. The argument in favour of invention that relies on the absence of publication of the idea in question depends on it being shown that one would have expected it to have been published. In my judgment, such arguments must be treated with care save in areas where it is clearly shown than such could have been expected.

TECHNICAL BACKGROUND –FACTS

Electricity generation and supply and the landscape of the industry

55. Power is generated, often in power stations, and fed (at a high voltage) into the national grid, which delivers power to "grid supply points". Electricity distributors take power from the grid supply points in their region and feed it through major substations to local substations and then to individual premises at 400V or 230V.

56. Prior to 1998 there were 14 regional electricity companies (RECs) (for example, London Electricity, Northern Electric, Southern Electric, Scottish Power etc). The distribution functions within the RECs were responsible for providing energy to the premises including metering. The supply functions within the RECs were responsible for procuring energy from generators and selling it to end-user customers.

57. The customer-management side of the business was known as the Public Electricity "Supplier" or 'PES', even though, technically, it was the distribution side of the business that was actually making the power flow to the premises.

58. Following deregulation of the electricity industry in 1998, the distribution and supply functions of each of the 12 regional electricity distributors were separated. Suppliers and distributors underwent mergers and acquisitions between 1998 and 2005.

59. Prior to deregulation in 1998, metering was owned and operated by the distributor. After 1998, the metering process became the responsibility of the supplier but the meter was still owned by the distributor. However, after 1998, new metering became the responsibility of the supplier.

60. There was a licence obligation on distributors to continue to offer a metering service and most suppliers relied on this for many years including well after the filing date. At the filing date, the majority of meters were owned by the distributor, although, as new meters were installed each year, some could be owned and operated by the supplier. Regardless of ownership of the meter, at the filing date, the supplier was responsible for reading the meter.

61. Each distributor (together with National Grid) was able to measure how much energy it was taking from the grid, and would bill the supplier on a half-hourly basis. However neither the distributor nor the supplier knew how much power each individual consumer was using until a meter reading was provided. The parties were reliant on the end-user meter-reading process to determine exactly where and when, and how much of, this energy was being used.

Types of meter

62. There were several types of utility meter at the filing date: gas, electricity and water, domestic and industrial.

63. There were very few electronic gas and water meters deployed, the majority being mechanical. It was easier to devise a practical electronic or solid-state device for electricity metering than such a device for gas or water because an electricity meter can take a small amount of power from the 230V ac customer supply, reduce it to normal electronics voltages, say 5V dc, and use that to power the device.

Electricity metering

64. Usage by individual customers was normally measured using a regulator-approved electricity meter. Such meters have an electrical input from the distribution mains and an electrical output into the premises. The meter measures the electrical energy passing through the meter over time, and records the cumulative amount of electrical energy consumed in kilowatt hours (kWh).

Basic characteristics of electricity meters

65. All electricity meters (and it suffices for present purposes to focus on these since in the relevant respects other meters were similar) would have at least:

a. the necessary metrology (i.e. the ability to record energy consumption of the premises) with appropriate accuracy;

b. a visible display of the cumulative energy consumption recorded by the meter;

c. a faceplate stamped with a unique manufacturer's meter serial number identifying the individual meter and type designation identifying the approved meter type;

d. often, at least in the newer meters, an optical communications port (IEC1107). This enabled an authorised agent with the necessary software keys to pull data from the meter automatically, and to alter certain internal field-programmable parameters. This port was analogous to a typical "serial port" that was commonly used on communications devices except there was no direct electrical connection between any device outside the meter and any parts within the meter; and

e. a seal, making it impossible to remove, alter or disassemble the device without leaving forensic evidence of doing so. The seal protected access to the electrical inputs and outputs, such that all communication was via the optical port.

Credit and pre-payment meters

66. There were two well-known ways of billing customers.

a) Credit-based;

b) Prepayment / pay-as-you-go (PAYG).

Credit-based metering

67. In a credit-based metering system, the customer's metered supply would deliver electricity on demand into the premises. The electricity supplier would therefore need a meter reading from the display on the electricity meter. This was often done by the customer, who would pass the meter reading to the supplier typically by filling in a special card left by the supplier for this purpose. Following receipt at its billing centre of a dated meter reading, the supplier would compare the new reading with the previous dated reading, apply the appropriate tariff, and generate a bill for the customer. The customer would consume energy subject to a credit agreement with the supplier.

68. At the filing date, a credit meter had no means of turning the energy flowing through it on and off. The only way the supplier could turn a credit meter off was to disconnect it. To do this an engineer had to visit the premises and remove the main 100A fuse, which is in a special sealed unit on the live side of the meter. Similarly, the only way a supplier could enable energy supply to a premises was to send an engineer out to replace the main fuse. The main fuse, like the meter, was sealed so that only authorised staff could access it.

Pay as you go meters

69. A well-known alternative to credit metering at the filing date was a pay-as-you-go (PAYG) meter. Such meters have an additional "breaker" which may be built into the meter or placed between the meter and the distribution box. The breaker can break the circuit (i.e. disconnect the power supply), and can be controlled by the meter automatically with no intervention necessary from a visiting engineer. There is no automatic re-connection. A PAYG meter, unlike a credit meter, only delivers electricity into the premises if there is sufficient credit in the meter. A credit meter is normally 'on', unless it has been disconnected by an engineer, in the sense that it always delivers electricity to the customer regardless of the customer's account balance. On the other hand, a PAYG Meter is normally 'off', and is only turned on if the customer manually reconnects the supply by crediting the meter with a recognised form of payment.

Developments in pre-payment meters

70. The earliest PAYG meters used a coin-box. A customer would introduce credit by putting a coin in the box, and then turn the dial to reconnect the power and turn the meter 'on'. As energy was consumed, the dial would slowly return to zero, at which point the meter would break the circuit and return to its 'off' state. Coin-operated meters were, by the filing date, well-established albeit somewhat old fashioned, technology.

71. In the 1980s there had been a rise in bad debt amongst credit customers, resulting in an increasing number of disconnections arising out of customers not paying their bills. As Mr Pollock says, there was a feeling in society that it was disproportionately onerous to remove a person's electricity supply altogether, and so the suppliers wanted to move to a new solution. The difficulty of managing the problem of bad debt was also something that suppliers wanted to avoid. A PAYG Meter solved both these problems, as the consumer became responsible for managing his or her own debt, and it was up to the

consumer to decide whether the meter was ‘on’ or ‘off’. As a result, PAYG systems became more prevalent in the 1990s and in my judgment by the priority date a skilled person would have been interested in developing PAYG systems.

72. PAYG meters had all the features common to credit electricity meters discussed above. In addition, PAYG electricity meters that were being newly installed at the filing date would have had the following extra features in addition to those of a credit meter:

a. An internal memory capable of holding energy consumption data;

b. An internal memory capable of holding the MSN, put there at the time of manufacture;

c. An internal memory capable of being programmed at the time of installation, with field installation information (such as debt balance, tariff etc.);

d. An internal memory capable of holding software for PAYG operations;

e. A display showing how much value there remains to be consumed;

f. A means of entering credit, such as a card slot or token slot; and

g. A breaker capable of switching off the whole supply to the premises.

Principles of identification of PAYG meters

73. One of the most fundamental principles of PAYG meters, and almost too obvious to mention, is that they operated on the principle of crediting specified and identified meters with appropriate funds. With coin-in-slot meters, this would present no difficulties – the customer would put the coins into the slot of his or her meter at home.

74. With electronic meters where credit was to be applied remotely in any way, it was necessary to have a mechanism for directing the payment in the appropriate way so that the relevant meter would be credited. That required some form of identification of which there were various known kinds.

Cashless PAYG Meters

75. In the mid 1990s there were a number of cashless prepayment systems, each of which provided the supplier with advance payment, and avoided the need to empty the coin box:

a. the one-time-use numeric code;

b. the mag-stripe token;

c. the prepayment key; and

d. the smart card or smart key.

One-time-use numeric code

76. This was a system developed largely in South Africa in the early 1990s to support the rural electrification program, and later promoted successfully post 2000 in Northern Ireland by PRI, a manufacturer of solid-state digital meters.

77. A prepayment meter in this system had a keypad for entering a code. A feature of the South African meters was that they had no slots or apertures that might admit tiny insects or provide a focus for mechanical interference.

78. The customer would visit an appropriate shop, identify herself and/or her meter via a mag-stripe electricity "identity" card, and pay a desired amount for electricity. In return, she would receive a code printed on her receipt. When she returned home, she would type this code into the meter. If the code was recognised by the meter, the meter would be credited with the appropriate amount of credit.

79. It was known that these one-time-use codes could not be used a second time in either that customer's meter, or in another meter, but it was not generally known how. This was a guarded secret as there was concern that someone could create their own codes by reverse engineering the process.

80. There was some dispute on the evidence as to how much would have been known by the notional skilled team about the position in South Africa. Ultimately, I consider that taking the evidence of the experts as a whole, both of whom referred to the position in South Africa and its importance as a PAYG territory albeit did not develop it in great detail, those skilled in the art in the UK would either have known that, in South Africa, pre-payment customers did not have utility accounts or account numbers or it would have been natural for the skilled team to find this out when embarking on designing a PAYG meter system. Exactly how much would have been known by the skilled person of the identifiers used in South Africa, to make payment to the correct meter was not, in my view adequately established on the evidence. For reasons which appear below, I do not however, consider that exactly what would have been known about the position in South Africa is of real relevance to the case. Of somewhat greater importance was the more general fact that for millions of customers, in an important market, identification of the destination of payment did not take place by reference to an account number.

The mag-stripe token

81. Through the early 1990s the dominant prepayment technology for electricity was based on paper cards with value encoded on a magnetic stripe. Customers would buy these cards over the counter. Originally these were undifferentiated tokens that were known to work for any person in any meter, so they had intrinsic value on the illegal "secondary market".

Prepayment key

82. In the late 1980s Schlumberger introduced a cashless 'key' system. The key was essentially a memory chip housed in a plastic casing shaped like a real door key and designed to be kept on a key-ring. The plastic keys were programmed to work with an

individual meter, and were shipped with the meter by the manufacturer. When the key was inserted into the meter, the meter was able to recognise the unique key through the code in the memory and to "read" any additional information that it was carrying, such as credit data.

83. When paying for electricity, the customer would take her key to an authorised retail outlet. The customer would insert the key into a special crediting device, pay the shopkeeper the desired amount of money, and the crediting device would then "charge" the key with that amount of credit by writing to the memory. When the customer returned home and inserted the key in the meter, the meter read the memory, transferred the credit to the meter memory, and then overwrote the memory in the key to erase the credit. The data held on the key and details of the crediting process was a secret that was not known outside Schlumberger.

Prepayment smart-card or smart-key

84. The prepayment key system required that the customer was repeatedly transferring the physical key between the meter and the retail outlet each time payment was made. If the key was not only able to carry payment information from the retail outlet to the meter, but was also able to carry metering data from the meter to the retail outlet, then the need for a meter-reader to visit the property would be substantially reduced from quarterly to every 15 – 18 months. This bi-directional communications feature was first introduced in the early 1990s by Landis & Gyr on behalf of BG. The smart key (or actually a smart card in this case) technology looked very similar to the simple prepayment key from the user's point of view, but the memory capacity was much greater (2k bytes), and the smart key had its own processor. In my view, by the filing date it was well known that there were means for electronic communication of meter reading information.

85. When inserted into the meter, the metering data would be recorded on the smart key so that the reading on the key matched the reading on the meter. Furthermore, a set of additional status information (such as detected interference with the meter or meter malfunction) was recorded on the smart key. When the customer took the smart key to the retail outlet, the "status report" from the meter was transferred into the retailer's key reader while the credit transaction and other outbound data was transferred from the retailer's key reader to the customer's smart key. A telephone link from the retailer's key-reading device back to the utility company completed a full bi-directional communications path between the meter and the central billing system. The process of reconciliation could therefore be conducted remotely from the meter, and a meter-reader or meter engineer needed only to visit the meter in the event that the regular status reports revealed the need to do so.

86. The outbound data that was transferred at the retail outlet on to the smart key could be used to transfer any new tariff data via the key to the meter obviating the need for special adjustments for two-rate consumption or standing charge collection. The meter had all the information needed to calculate the appropriate rate to charge exactly as it would be

done in the billing system. In this way, the information in the meter was synchronised with the information in the billing system subject to the frequency of the payments actually made.

87. By the filing date, in the UK, key, mag-stripe, smart card and smart key systems were the predominant methods of prepayment, while elsewhere in the world the one-time-use code system was widespread. That, in my view would have been part of the skilled person's common general knowledge.

The industry needs at the time

88. The favoured method, by both customer and supplier, was the smart card/key method. This provided the minimum of disruption to the supplier and to the customer. Mr Pollock says in his report that the supplier was content to receive regular metrology data and payment in advance, whilst the customer was happy that topping up the meter was relatively straightforward, and he or she didn't need to be bothered by the meter-reader every quarter. He observes that the smart key system "solved all of the problems that the utility companies wanted solving, and kept the customer happy. There was no need or desire to have any better system." I do not accept that evidence at that level of generality.

89. It is, in my view clear, inter alia from the prior art discussed below and the (correct) acceptance as to what formed part of the state of the art on behalf of Meter-Tech that there was considerable thinking at the filing date about remote crediting by a suitable data link of PAYG meters and in my judgment it was well known that this could be done and had significant advantages.

Trials of remote crediting PAYG systems

90. Mr James' evidence, which I accept, was that there were numerous trials of systems before the filing date which involved remote crediting of PAYG meters in the UK in which a large number of electricity boards had been involved. He says that there were "numerous" examples of prepayment systems trials actually operating by remote transmission of credit value from a central station by a telephone or similar link to a unit in the home and that these were reported in the relevant technical literature.

91. Mr James also said and I accept that at least the senior personnel at most meter manufacturers are likely to have had experience of such trials by the filing date. I do not consider that each individual trial or report of it was common general knowledge but, in my judgment, the skilled person would have been aware that there were trials of such systems going on (or had been in the past) although they would not necessarily be aware of the details of each of them. Again, because of the nature of the specific prior art referred to below, the case does not turn on whether these were common general knowledge because some of the prior art specifically reports on those trials.

Approaches to new designs

92. In my view, the skilled person would have been well aware that new approaches to remote crediting were being proposed and in several cases trialled and that they were in principle attractive options.

93. I also think that Mr Pollock puts it too high when he says that the energy industry was "opposed to implementing anything which would make it easier for the customer to switch suppliers". It is easy to understand that some in the industry may have been opposed to this but others would have wanted to make it easier. It is, in any event, in this case not important whether particular undertakings would or would not have been interested in adopting a particular system at the filing date. The evidence, taken as a whole, comes nowhere near establishing a technical prejudice against developing convenient metering systems even if they had the effect of facilitating switching between suppliers. This is not a situation analogous to the *Dyson* case in which there was an overriding prejudice at developing a particular kind of technology.

Identification of meters

94. An important aspect of the common general knowledge in this case concerns the manner in which meters were identified.

95. Having considered the evidence as a whole, in my judgment, the following picture of the position with respect to identification emerges and would have been known to the skilled person at the filing date.

96. First, with coin prepayment, the customer would charge his or her meter directly with a coin.There was no need for any more identification for individual prepayment transactions. When meters were read, they would be read directly by a meter-reader present at the meter.

97. Second, with the introduction of the first "key" methods of prepayment in the late 1980s, it became possible to link the keys to a specific meter and specific customer. For this kind of system, when a payment was made, the customer would need to identify him or herself.

Account number

98. Third, the account number is and would have been well known to be an identifier that the supplier uses to identify a particular customer account. This was the primary reference that the supplier's billing system would use. If a customer wished to make a credit to his PAYG Meter, (or any other kind of payment regardless of meter type) it would be related to a specific account number, as it is this identifier that is commonly used within the supplier's billing system. An account number is unique to a particular customer within a single supplier's billing system, but at the filing date, as now, may well not be unique as between one supplier and another.

99. The account number was also used by credit customers. If a credit customer needed to make a payment on his account, he would go into a shop with his account number and make the payment or post a cheque with an accompanying payment slip bearing the account number. It was also common practice to write the account number on the back of cheques in case the cheque became separated from the payment slip.

100. Mr Pollock says that, at the filing date, the only certain way a utility supplier would have of identifying a customer would be his or her customer account number. Although utility suppliers may have had records of some customer's meter serial numbers, the list would not have been complete. While I accept that utility companies would have had complete records of accounts and, in contrast, records of meter serial numbers (or other identifiers of the meter) may have been incomplete (see below), I do not accept that a skilled person would have understood that the only way of identifying a meter was by way of the customer account number. I do accept that the account number was not necessarily unique to the meter or to the location of the meter.

Meter Serial Number ("MSN")

101. Fourth, at the filing date it was well known that every meter had a unique number identifying that particular meter, namely the Meter Serial Number ("MSN"). An MSN was assigned to a given meter by the manufacturer. It was originally stamped into the metal faceplate inside the meter, and later laser-etched on the outside either as a number or a barcode. In some instances it was also programmed into internal memory within the meter prior to the meter leaving the factory. That too would have been well known.

102. I accept that, by the filing date, it was well known that the meter serial number is (in the UK) a reference number that can be used to identify an electricity meter and, even though there may have been some duplicate MSN's in existence, for practical purposes, the MSN would uniquely identify a given meter. Mr James said that it would have been common knowledge to anyone involved in electricity metering that all meters had a meter serial number unique to the meter and Mr Pollock agreed.

103. Such MSN's were not in a standard format and each meter would have a different number so that, if a meter was replaced, there would be a new MSN for the meter at that property. I also accept Mr Pollock's evidence that a supplier may not necessarily have had an accurate or up to date list of the MSNs associated with each of its customers. However, it would have been a matter of routine to obtain such number or numbers, if wanted.

104. Mr James says, and I accept, that of these various identifiers, the number that was unique to the meter and thereby unique to the location was the MSN and that in many kinds of electricity meter this would be embedded in the sense that it would be electronically stored in the meter and could not be changed or tampered with. In my judgement, that would have been well known and understood by the skilled person at the filing date.

Meter Point Administration Number ("MPAN")

105. Fifth, in 1998, the introduction of competition allowed consumers to choose their own supplier and move more easily between suppliers.

106. To facilitate the transfer of one customer to another supplier, the introduction of the Meter Point Administration Number, more commonly known as MPAN, Supply Number or S-Number, was imposed. This is a reference that identifies electricity import and export points onto the distribution network. The gas equivalent is the Meter Point Reference Number (MPRN). Collectively they are referred to as MPxN. The intention of MPxN was to make identifying the electrical and gas supply points easier so that any utility could supply any supply point. The MPAN was useful to the distributor, as it represented the 'end point' of the distributor's responsibility. The obligation to assign MPANs lay with the distributor, because the distributor was responsible for supplying electricity to the metering point.

107. Mr Pollock says that, at the filing date, those concerned with meters (i.e. the suppliers and the meter manufacturers) had no real interest in MPxN because the suppliers already had a customer identifier in the account number, and the meter manufacturers were not interested in where the meters were being installed (and could already identify their own meters by the MSN). He therefore took the view that the MPxN was not common general knowledge to the relevant skilled person at the filing date even though it may have been common general knowledge to others.

108. The extent to which the MPxN was known to those involved in designing meters is not very easy to assess on the evidence in this case and, ultimately, in the light of my findings that the MSN was very well known to those concerned with meter design, it does not matter. However, I consider that on balance, it is likely that the skilled person would either have known about this or would have found out about it at the filing date. There is no doubt it was a well-known identifier. The skilled person would have recognised, however, that for a range of reasons it was a less attractive identifier of an individual meter than the MSN.

109. It is important to note that, at the filing date, there was not a wide range of different ways of identification for effecting payment. In the evidence, really only three kinds of identifier were referred to (a) account number – which identifies the account (b) MSN – which identifies the meter and (c) MPxN – which identifies the point of supply. So this is not a situation in which the common general knowledge presents a large number of different established existing identifiers or kinds of identifiers.

Types of communication

110. There was ultimately no dispute that by the filing date a range of different means of wireless communication between electronic devices were well known. I have no doubt that a skilled person would have been well aware that the relevant information could be communicated using standard telephone lines, analogue cellular systems, digital cellular systems, radio and a range of other standard ways of communication of data. Equally, it

was ultimately common ground that the use of RF signals in the home would have been a common general knowledge technique for communications generally.

111. Specific examples of such kinds of communication, including Paknet, which was a main alternative to BT landlines were referred to in the evidence. This was a wireless system which was used by meter operators. It relied on the Vodafone network for coverage and it was well known that it could be used to obtain data from and provide data to meters. As Mr Pollock said, "Paknet could connect anything to anything via standard I/O hardware at either end" and was analogous to a hard-wired telephone connection. It was, in his words, an "enabler for a wide range of communication-based applications". At the filing date, it was known that cell-phone technology was becoming widespread, especially in urban areas, for mobile telephony although the actual coverage was not universal.

Other aspects of common general knowledge

112. Both experts referred to other aspects of common general knowledge at a considerable level of detail. While these formed useful background, it is not necessary to summarise this further.

THE PATENT

113. The Patent is entitled "A PREPAYMENT UTILITY METERING SYSTEM" and the invention is said to relate to a prepayment utility metering system which may incorporate a transaction authorisation system for secure authorisation of transactions and, in particular financial transactions.

114. In the section on the background to the invention the Patent states

> "Prepayment utility meters are typically installed in homes where the occupants cannot be permitted credit for electricity, gas or other utilities. A prepayment utility meter is fixed in place and arranged so that it cannot be tampered with. A user is provided with a key or some other form of crediting means that can be taken to a crediting terminal at a shop, Post Office, store of the utility provider or other public place and charged or loaded with credit in response to payment by the user. The key is then taken to the prepayment utility meter and inserted in an interface provided to credit the prepayment utility meter with the credit loaded or charged on the key. The prepayment utility meter then stores the credits in a memory and deducts appropriate amount from the credits for consumption of the utility.
>
> Whilst the arrangement is secure and convenient for the utility supplier, it is extremely inconvenient for the user and requires them to monitor credits within the prepayment utility meter and obtain credits as and when necessary. Particularly since most stores in which keys can be charged with credit are open only during normal working hours, the user must be sufficiently organised and monitor the prepayment utility meter so

that sufficient credits are available for evenings, weekends and Bank Holidays. Whilst some utility meters provide a small amount of credit, in premises where central heating, cookers and the like are all provided by one utility system this credit is quickly eaten up. Furthermore, user's resent a special trip merely to obtain credit for their prepayment utility meter.

A further form of abuse is often experienced by government agencies. It is common for government agencies to provide the aged, the infirm and the unemployed with benefits to cover central heating and basic utility usage. However, in present prepayment utility meter systems, the government agencies cannot directly provide prepayment utility meter credits and must instead provide the cash equivalent and rely on the users discretion to use the cash for purchase of such credit. Obviously the government agencies cannot control how this money is spent and this facility is often abused.

In addition, fraud is increasing dramatically for "card not present" credit card transactions. In such transactions, business is typically effected remotely, e.g. by Telephone or Internet Shopping. The purchaser discloses his or her name, credit card number and expiry date in order for the credit card to be charged for a product or service.

These sorts of transactions are different to "card present" transactions at Electronic Point-of-Sale Terminals or the like, where both the cardholder (purchaser) and the card are required to be physically present. The purchaser is required to sign an authorisation to permit a transaction to be charged against that card's account. The merchant is accountable for the verification and authentication of the card and the validation of the cardholder's identity.

By the fact that: 1. A recognisable card is presented 2. Identification, Authorisation and Entitlement processes are enforced 3. The location of the transaction is legitimate

Then the transaction qualifies as a "card present" transaction."

115. The invention is therefore primarily concerned with providing a way of using a utility meter (which is at a fixed location) as a way of simulating a conventional "card present" transaction by relying on the completely fixed and stable locations of the large number of utility meters and the fact that each of them has a unique identity. The statement of invention says:

"According to one aspect of the present invention, there is provided a prepayment energy supply system including a pre-payment utility meter, and a digital cellular transceiver provided at a location, the utility meter having an associated location identifier unique to the location and a memory for storing pre-payment credits, the

utility meter being arranged to communicate with a remote communication unit via the transceiver, the remote communication unit having a database of the unique identifiers and transceiver numbers, wherein a payment for crediting to a meter includes the unique identifier, the remote communication unit being arranged to determine the transceiver number from the unique identifier, to communicate with the utility meter via the transceiver and to add appropriate pre-payment credits to the memory. Utility meters must be fixed at, or very close to, the location to be metered because they need to measure the supply of the utility as it enters the location.

Taking advantage of the fact that an installed meter is virtually immoveable, that the meter has an embedded unique and secure identifier that identifier satisfies criterion 3 (the location of the transaction is known) and meets "card present" requirements. The user interface unit enables the user (the purchaser) to confirm their identity and to prove that the card is present by inputting a transaction authorisation (such as by entering the card in a card reader and providing an authorisation code), therefore satisfying criteria 1 and 2. The transaction authorisation can be securely communicated to the financial institutions for fulfilment and settlement as a legitimate "card present" transaction."

116. In this description of the invention, the device is used to pay for metered electricity. However, other aspects of the specification are more general and disclose the use of the approach to pay for other goods or services ordered over the internet which may or may not be payment of utility bills.

117. The invention as applied to a pre-payment meter in which a payment for the electricity metered by that meter may be made in advance, at a shop or bank for example, is shown in Fig. 5 which is described as follows (see **Annex 1)**:

"Figure 5 is a schematic diagram of the system of Figure 4 according to one aspect of the present invention. Where a utility meter 10 is configured as a pre-pay meter, the location is also provided with an identification card. The identification card carries the unique identification code embedded within the utility meter 10 and allows somebody to credit pre-payments to the meter 10 remotely. On visiting a bank, supermarket or other facility offering pre-payment facilities 210, someone possessing the card can present it along with a pre-payment in order for the meter to be credited. Data from the card is obtained at the pre-payment facilities 210 by reading the card using a card reader. From the data, the unique identification code is obtained and communicated, along with the amount of pre-payment received, to a central communication unit 220.

The communication unit 220 includes a database 230 of the unique identification codes cross-referenced with the digital cellular network number for the transceiver for the meter having that code. The code received from the pre-payment facility is cross-referenced in the database 230 and the digital cellular number is obtained. The communication unit 220 communicates with the meter 10 via the digital cellular

network 120 and instructs it to credit the amount pre-paid. A pre-payment transaction does not have to be done by the occupant of the location and could be performed by other parties, including Government Agencies. In addition, the system could be configured such that pre-payment could be made from the home via the user interface unit 30 in the same manner as a regular financial transaction is made. Since the utility meter is in affixed place it provides a unique identification key that cc passports" all other intelligent devices within the location. The utility meter can use its unique electronic identity and its "fixed place" location to log the activity of all related Pico-net devices."

118. The central idea is therefore to use the unique identity of the meter to identify the meter to which payment is to be credited, use the digital cellular number to communicate with the relevant meter and use a system of cross referencing the unique identity of the meter with the digital cellular number in a database. One of the benefits of the invention is said to be that, inter alia, government agencies can credit users' pre-payment meters directly by using the unique identity number of the meter instead of providing customers with the cash equivalents which might be spent on other things and relying on them to use the cash to purchase such credit.

Meter-Tech's characterisation of the invention

119. In my judgment, Meter-Tech makes too much of this benefit stated in the patent. In its closing skeleton it submits that:

> "…the invention in this case is an idea: the idea of using a neutral identifier for the purpose of opening up a pre-payment meter to wireless access unconstrained by suppliers".

120. This submission is not justified by the specification of the Patent or the claims.

121. First, the claims in issue are not limited, either in their terms or by implication, to a situation in which access is provided to third parties unconstrained by suppliers. Indeed, the claims may be satisfied by a system and method in which such access was or was not provided. Although it is true that the design of the Patent could be so used, that would only happen if suppliers or the undertaking operating the database were to give out the identity numbers of the relevant customer's meters.

122. Second, a system which used account numbers (or any other suitable identifier of the destination of the payment) could also be used by third parties to top up customer accounts if details were given out to third parties. Conversely, a system which uses numbers specifically identifying the meters does not need to be useable for this purpose and may well not be.

123. Third, the passage said to support the centrality of that concept only refers to the ability to use the system for third parties to pay credit to a meter directly instead of paying cash equivalents to a customer. That could just as well be done by paying a credit into a customer's account instead of paying the customer in cash. The distinction drawn in that part of the specification is between third parties paying the money to the meter or paying the money to the customer, not between different ways of paying money into the meter.

124. Fourth, there is nothing in Fig. 5 of the Patent which limits the invention to a situation in which access is given to third parties. It is said that this is the result of considering the various computers and communication lines at the top right hand corner. This is not justified since each of those units could be operated by any entity including a supplier.

125. Fifth, this seems to be a case of a reconstruction, using hindsight, of an allegedly more specific inventive concept which is not that of the Patent and which was never seen as such in the document itself.

126. In this connection, an enthusiastic submission was made by Meter-Tech in closing to the effect that the "government has come round to the attractions of the Patent" and has "forced the Patent on the industry". There was no evidence for this submission and I reject it without hesitation. It is particularly unjustified since in the alleged infringement by the future systems pursuant to the UK Government scheme the alleged benefit is not even used – all payments go to the suppliers, which remain in control of allocation of the credits once payment has been received into their accounts. Thus, it would appear that not only is the alleged invention not present, the scheme actually adopted does not make use of it.

CONSTRUCTION

Law

127. The approach of this court to the construction of patent claims is well-established and was not seriously in dispute save to the extent as indicated below.

General principles and the Protocol questions

128. First, the general law is summarised in *Virgin Atlantic Airways Ltd v Premium Aircraft Interiors Group* [2009] EWCA Civ 1062; [2010] R.P.C. 8, in the main interpreting the judgment of Lord Hoffmann in *Kirin-Amgen v Transkaryotic Therapies (No.2)* [2005] 1 All ER 667:

> "(i) The first overarching principle is that contained in article 69 of the European Patent Convention.

(ii) Article 69 says that the extent of protection is determined by the claims. It goes on to say that the description and drawings shall be used to interpret the claims. In short the claims are to be construed in context.

(iii) It follows that the claims are to be construed purposively—the inventor's purpose being ascertained from the description and drawings.

(iv) It further follows that the claims must not be construed as if they stood alone—the drawings and description only being used to resolve any ambiguity. Purpose is vital to the construction of claims.

(v) When ascertaining the inventor's purpose, it must be remembered that he may have several purposes depending on the level of generality of his invention. Typically, for instance, an inventor may have one, generally more than one, specific embodiment as well as a generalised concept. But there is no presumption that the patentee necessarily intended the widest possible meaning consistent with his purpose be given to the words that he used: purpose and meaning are different.

(vi) Thus purpose is not the be-all and end-all. One is still at the end of the day concerned with the meaning of the language used. Hence the other extreme of the Protocol—a mere guideline—is also ruled out by article 69 itself. It is the terms of the claims which delineate the patentee's territory.

(vii) It follows that if the patentee has included what is obviously a deliberate limitation in his claims, it must have a meaning. One cannot disregard obviously intentional elements.

(viii) It also follows that where a patentee has used a word or phrase which, acontextually, might have a particular meaning (narrow or wide) it does not necessarily have that meaning in context.

(ix) It further follows that there is no general ‘doctrine of equivalents’.

(x) On the other hand purposive construction can lead to the conclusion that a technically trivial or minor difference between an element of a claim and the corresponding element of the alleged infringement none the less falls within the meaning of the element when read purposively. This is not because there is a doctrine of equivalents: it is because that is the fair way to read the claim in context.

(xi) Finally purposive construction leads one to eschew the kind of meticulous verbal analysis which lawyers are too often tempted by their training to indulge.”

The role of the Improver/Pozzoli questions

129. Second, the courts have derived an approach to the assessment of whether a minor variant is properly to be regarded as within the claim in the form of the “Improver questions”, also called the “Protocol questions” after article 69. The questions are intended to assist where the issue is whether a feature which fell outside the primary, literal or a contextual

meaning of a word or phrase in the claim was nevertheless within its language as properly interpreted (see *Improver Corpn v Remington Consumer Products Ltd* [1990] FSR 181 and *Kirin-Amgen*. They are as follows:

> (1) Does the variant have a material effect on the way the invention works? If yes, the variant is outside the claim. If no:
>
> (2) Would it be obvious at the date of publication of the patent to a reader skilled in the art that the variant solves the problem underlying the invention by means which have the same technical effect? If no, the variant is outside the claim. If yes:
>
> (3) Would the reader skilled in the art nevertheless have understood from the language of the claim that the patentee intended that strict compliance with the primary meaning was an essential requirement of the invention? If yes, the variant is outside the claim.

130. In *Actavis UK Ltd v Eli Lilly* [2014] EWHC 1511 (Pat) [2015] Bus. L.R. Arnold J remarked that in recent years, the *Improver* questions had fallen out of fashion in judgments of the English courts, but that this was unfortunate given that they provide a structured approach to the question of equivalents and they have been influential across Europe.

131. I agree with Meter-Tech's submission, that they are of particular utility where a feature of a claim strictly construed would exclude a variant but there is no technical reason to do so and they are applied with greatest utility in this context (see e.g. *Gemstar-TV Guide International Inc v Virgin Media Ltd* [2009] EWHC 3068 (Ch); [2010] R.P.C. 10 Mann J). They remain useful so long as it is borne in mind that the key issue is whether a technically trivial or minor difference between an element of a claim and the corresponding element of the alleged infringement none the less falls within the meaning of the claimed element, when read purposively (*Kirin-Amgen*).

The role of evidence on construction

132. Third, the views of experts on matters other than terms of art is inadmissible for construction (see Aldous LJ in *Scanvaegt v Pelcombe* [1998] F.S.R. 786 and Floyd J (as he then was) in *Qualcomm v Nokia* [2008] EWHC 329 (Pat) at [9] to [11]).

133. In this case, Meter-Tech applied to strike out a good deal of Mr James' evidence on scope of claims before the trial but Mr John Baldwin QC, sitting as a deputy High Court judge, declined to do so, as a matter of case management. In my view, with respect to him, he was clearly right on this, not least because Meter-Tech's expert also gave his own views on the scope of the claims, some of which revealed that he had been approaching key issues in an incorrect way by reading matters into the claims which were not there in order to defend their validity.

The relevance of specifically disclosed embodiments

134. Fourth, Meter-Tech contends that the court should have regard to the advantages provided by the specific embodiment described in the specification in construing the claim. As to that, it is necessary to bear in mind the well-established principle of law restated by the Court of Appeal in *Adaptive Spectrum and Signal Alignment Inc v British Telecommunications Plc* [2014] EWCA Civ 1462. Floyd LJ said at [45]:

> "45. Subject to a point which arises in connection with 495, the parties did not dispute that the correct approach to construction of a patent is that explained by Lord Hoffmann in his speech in *Kirin Amgen v Hoechst Marion Roussel* [2004] UKHL 46; [2005] RPC 9. The object is to ascertain what the person skilled in the art would understand the patentee to be using the words in the claim to mean. The Court of Appeal summarised the relevant principles in *Virgin Atlantic Airways v Premium Aircraft Interiors UK* [2009] EWCA Civ 1062 at [5]. There is no need to repeat them here. It is however worth emphasising one point. A number of BT's arguments on this appeal involve reading limitations into the claim which are not there as a matter of language, on the grounds that to do so would follow more closely that which is disclosed by way of example in the body of the specification. It must be remembered, however, that the specification and claims of the patent serve different purposes. The specification describes and illustrates the invention, the claims set out the limits of the monopoly which the patentee claims. As with the interpretation of any document, it is conceivable that a certain, limited, meaning may be implicit in the language of a claim, if that is the meaning that it would convey to a skilled person, even if that meaning is not spelled out expressly in the language. However it is not appropriate to read limitations into the claim *solely* on the ground that examples in the body of the specification have this or that feature. The reason is that the patentee may have deliberately chosen to claim more broadly than the specific examples, as he is fully entitled to do."

Construction to avoid the common general knowledge

135. Fifth, Meter-Tech also contends that the claim should be construed so as to avoid invalidity in the light of the common general knowledge. In the *ASSIA* case, cited above, the Court of Appeal said on this issue:

> 107. Mr Wyand submitted that the court should be slow to arrive at a construction which resulted in a finding of invalidity for obviousness over common general knowledge. He relied on a passage in Terrell on the Law of Patents, 17th Edition at paragraph 9-107:
>
> > "The overall principle is therefore that a construction which leads to a foolish result should, if possible, be rejected as being without the intention of the patentee, for a construction which does not lead to an absurd result is to be preferred.

> However a finding of invalidity cannot of itself be regarded as an absurd result, unless the relevant piece of prior art is specifically acknowledged in the patent, or unless the invention would to the knowledge of the ordinary reader then be obvious simply in the light of common general knowledge."

108. This passage follows a discussion of two cases. The first is a decision of this court in *Ocli Coating Laboratory v Pilkington* [1995] RPC 145. In that case the court concluded that a good reason for confining the meaning of the claims to what it described as a literal construction was that, if the wider construction was adopted, the patent would be rendered obvious in the light of the prior art. As the authors of Terrell point out, however, that cannot be a universal proposition. Where there is no reason to assume that the patentee was aware of a particular piece of prior art, his claim may well have been framed in ignorance of it. In such circumstances it would be wrong to impute to the patentee an intention to frame a claim so as to avoid attacks which could be based on it. It is also perhaps relevant to observe that that case was decided at a time when the courts decided construction by making a distinction between the strict, literal or acontextual meaning of the language and its purposive meaning, as opposed to adopting the unitary approach propounded in *Kirin Amgen*. One aspect of that approach invited speculation as to whether there was a possible reason why the patentee might have wanted to restrict himself to the strict, literal meaning.

109. The second case cited was a decision of Jacob J in *Beloit v Valmet (No 2)* [1995] RPC 705. At page 720 Jacob J pointed out:

> "… there is normally no reason to suppose the patentee when he set the limits of his monopoly knew of a particular piece of prior art … Of course the position is different if the prior art is specifically acknowledged in the patent…"

110. Even if prior art is specifically acknowledged, much may turn, as Lewison J pointed out in *Ultraframe v Eurocell* [2005] RPC 7 at [73], on the way in which the prior art is referred to in the patent.

111. As with any canon of construction, one must be wary of treating it as a rigid rule. Moreover as soon as one departs from documents specifically acknowledged in the specification, the skilled reader has no basis for assuming that the patentee was aware of the document in question. Still further, where the objection is one of obviousness rather than lack of novelty, a value judgment is involved on which widely differing views are possible. It is true that if the document is said to form part of the common general knowledge, it might be said to be more likely that the patentee is aware of it. But a patentee may have been isolated from the common general knowledge, or may, despite the later finding of obviousness, have genuinely believed that he had made an invention over it. As will be seen below, the argument of invalidity over Kerpez involved, amongst other things, resolving a dispute between experts as to the feasibility

of identifying noise sources. I am not persuaded therefore that it would be right to give weight to this factor in the present case."

136. In my judgment, this approach is equally applicable in the present case, having regard to the contents of the specification, the disputes over the common general knowledge and those over obviousness. That is partly so because Mr Pollock's (and Meter-Tech's) original view was that the Patent would be valid regardless of whether it was given a broad or a narrow construction.

Construction to avoid added matter

137. However, the approach may, in an appropriate case, be somewhat different if it is said that a given construction would add matter (such as by reading implicit requirements into a claim which were not disclosed in the specification or application) or if a given construction would result in insufficiency. In those circumstances, the reason that it is appropriate to take that into account in construing the claim is that the points on construction are internal to the document itself: there is no particular reason to construe a claim in such a way as would result in the specification, taken as a whole, disclosing additional matter. That is not because of a desire to construe the claim to avoid invalidity of the patent on the ground of added matter but rather because it is inappropriate, in any event, to construe a claim by reading into it matter which was not disclosed in the specification or the patent itself.

Issues of construction

138. The parties have divided claim 1 into labelled integers as follows:

> [A] A pre-payment energy supply system including [B] a pre-payment utility meter, [C] and a digital cellular transceiver [D] provided at a location to be supplied with energy, [E] the utility meter having an associated location identifier unique to the location [F] and a memory for storing prepayment credits, [G] the utility meter being arranged to communicate with a remote communication unit via the transceiver, [H] the remote communication unit having a database of the unique identifiers and transceiver numbers, [I] wherein a payment for crediting to a meter is directed as a signal to the remote communication unit and includes the unique identifier, [J] the remote communication unit being arranged to determine the transceiver number from the unique identifier, [K] to communicate with the utility meter via the, transceiver and to add appropriate pre-payment credits to the memory.

139. Issues of construction have been raised on the majority of the integers, underlined above. Some of these intersect closely with the infringement case. It is nonetheless convenient to discuss the general points in this section, albeit leaving the application of the

construction to the products and systems identified in the PPDs to be addressed more specifically below.

(i) "A pre-payment energy supply system including a pre-payment utility meter" [A] and [B]

140. The reason the issue arises is because, in some of the BG installations, the meters can be configured as credit meters or as pre-payment meters or, indeed, in other ways. The majority of meters in the country currently installed do not operate as pre-payment meters and it appears to be BG's customers' preference to have credit meters. This point therefore goes more to the question of the extent of infringement rather than whether there is or is not infringement at all.

141. Meter-tech contends that the requirement that a meter be a "pre-payment utility meter" requires only that the meter is capable of being configured so as to be useable as a pre-payment meter (i.e. has the relevant hardware and firmware even if it has not been configured to operate as such). Meter-Tech submits that a meter having those necessary characteristics of a pre-payment meter falls within this integer even if at a given point in time it cannot be operated in such a mode because it has not been so configured.

142. Similarly, it is said that "a pre-payment energy supply system" does not require that all of the meters are in fact configured to operate in pre-payment mode.

143. Although its arguments are not entirely clear on this issue, BG's position on this appears to be that a meter which is installed as a credit configured meter but which is capable of operating as a pre-payment meter does not fall within the claim and would only fall within it were it to be reconfigured to operate in pre-payment mode. I have taken BG to contend that, likewise, a system is not such a system unless in fact operated in pre-payment mode.

Discussion

144. Issues of this kind are increasingly common in patent cases, because the functional characteristics of devices which formerly were either hard-programmed or where characteristics were mechanically/electro-mechanically provided in a fixed way are now more commonly provided by modifiable and upgradeable software or firmware. In such products, sometimes a functional characteristic can be turned on or off remotely, by in effect activating or deactivating installed software rather than even by installing or removing the software. Moreover, it is increasingly difficult, with software functionality often distributed over more than one part of an integral system, for a clear boundary to be drawn between software that is actually installed and not installed.

145. Nonetheless, there is a relevant distinction between a device which has a given functionality installed by way of software but where that functionality has not been activated and one in which there is no such software at all. It is not, in my view, unreasonable to treat a meter which has, for example, firmware enabling it to operate as

a pre-payment meter to be regarded as such even though that software may need to be activated in order for it to operate as such.

146. Moreover, in the context of this case, whether a meter is a pre-payment meter does not just depend on the software. A pre-payment meter has to contain some means for switching the electricity on when there is sufficient credit in it. If such a meter has such a facility and a facility to activate or install software which would enable the meter to operate as a pre-payment meter, in my judgment, it satisfies this integer, even if all of the software is not installed at that moment.

147. On this issue, I have had regard to the evidence from both experts on the characteristics of a pre-payment meter which is essentially the same as to the principal characteristics of such a meter and which, to my mind, accords with what the Patent itself states or implies about such meters. In my view, the same applies to a pre-payment "system".

148. In my judgment, taking the context of the words and their purpose into account, Meter-Tech is correct on this issue that a meter which has the facility to be operated as a pre-payment meter as a result of installed software and hardware is a "pre-payment meter" within the scope of the claim, even if that facility is not activated.

149. As to the system, I think the position is somewhat more complex. The Patent contemplates that a system may include any number of meters. However, it may seem rather artificial to treat a system of meters which, taken as a whole, employs mainly credit meters as a "pre-payment utility metering system". It makes more sense to treat only that part of the system which employs such metering as such a system. On this approach, this integer would only be satisfied if the meters, even if capable of being operated as such, were actually activated. On the other hand, a more realistic and technically justifiable approach would be to treat such a system as being a pre-payment utility metering system, albeit that it is also another kind of system. That would be more consistent with the approach to interpretation of this integer insofar as it relates to the meters.

150. I therefore consider that this integer (taking [A] and [B] together) is satisfied if the system includes at least one meter which may be configured to operate as a pre-payment meter and has the necessary switching facility to turn the supply on and off if so configured.

This issue of construction in the context of the infringement case

151. However, the point is not quite as simple as that. BG says in its main skeleton argument (para. 243) that Meter-Tech's case is that meters installed as credit configured meters are "not alleged to infringe" and reference is made to the Re-re-Amended Particulars of Claim, para. 19. I am bound to say that I read Meter-Tech's pleading as alleging the opposite and that it contends that BG infringes by the use of meters which have a pre-payment facility and that, even if they do not, there is a threat to infringe as and when converted to pre-payment meters.

152. I do not think this matters for the case overall, since neither side contends that the precise basis upon which infringement is found is critical at this stage of proceedings.

153. It is, however, important to bear in mind that, where a product or method falls within this claim on the basis that the integer is satisfied by the presence of a facility which may be configured to pre-payment mode, it does not follow that significant monetary compensation or injunctive relief could be obtained in respect of the operation of the system where such meters were installed with that capability but where that facility was not activated.

154. It is possible that such would be regarded as disproportionate as a matter of UK law, as well as contrary to the requirements of the Enforcement Directive. Although the court would doubtless be open to argument to the contrary if the need arose, prima facie, the role of the patent system and the courts in the context of claims for royalties for use of an invention is to provide reasonable compensation which reflects the extent to which the invention is used, not to provide a mechanism for extracting unreasonable compensation even for situations where an invention is not being used. As Meter-Tech recognised in its opening, there may be a separate argument to be had over the right remedy if there were infringement of the system and method claims only or largely as a result of the presence in such meters or systems of features which can be activated but which, for millions of customers (the vast majority), may never be activated at all.

155. That reflects a wider point that issues of scope of claim and whether there is infringement must not be confused with issues of remedy on the assumption that the claimed features are present. These points are of particular importance where individual products operate as part of a wider system. The argument put forward by BG that it would be wrong to treat this claim as infringed in respect of the latent but unused facility to some degree conflates the separate issues that require analysis here.

156. A similar point applies to an allegation of infringement or threatened infringement by the supply (in shorthand) of "means essential". In supplying a meter to a customer which was capable of being configured as a pre-payment meter but which was configured as a credit meter, BG may not infringe in virtue of the supply of means essential on the footing that BG may not, at that moment, intend that the meter should be reconfigured as a pre-payment meter. It would, however, be somewhat unreal to say that BG intended that to happen with respect to that meter if its primary and preferred approach would never to be to activate the pre-payment facility for the majority of its customers, because it was never necessary to do so.

157. These issues may broadly be categorised as all matters going to the extent to which there has been, or there is threatened to be, use of the invention and the consequences if there has been such use. The focus of this trial has been whether there are valid rights and whether they have been used at all. Because there is a degree of overlap between liability

and relief issues, aspects of extent of liability are more appropriately addressed together with relief more generally. Moreover, the facts and arguments relevant to this potentially complex issue have not been explored at this trial and it is unnecessary to make a specific finding in that respect because, for the purpose of this case, I proceed on the basis that, for the reasons given, in relation to the current and past systems, at least one meter has been operated or attempted to be operated as a pre-payment meter and that such is also the intention with respect to the future systems. As regards the systems currently installed it is not in dispute that tens of thousands have been operated as pre-payment meters and it is equally not in dispute that a large number of the future systems will also be operated in that mode.

(ii) "provided at a location to be supplied with energy" [D]

158. This integer requires the digital cellular transceiver to be provided at a location to be supplied with energy. The description does not go into details about the precise location of the transceiver but, of the utility meter, it says that the meter is provided at a location to be metered (p6, lines 14-15) and states:

> "Utility meters must be fixed at, or very close to, the location to be metered because they need to measure the supply of the utility as it enters the location".

159. BG contends that the transceiver of this integer is not to be treated as at a location to be supplied with energy if it is, for example, outside premises or in collective communal locations such as an entrance hall of a block of flats. Meter-Tech submits that such a construction does not have sufficient regard to the purpose of the integer. I prefer Meter-Tech's contentions on this issue for the following reasons.

160. First, there is nothing in the Patent which gives precise directions as to the location of either the meter or the transceiver. Although, it contemplates that they are both at the location to be supplied with energy the location of the claims can be something as broad as a house or an address.

161. Second, I do not think it makes any technical difference whether the transceiver is immediately adjacent to the point at which the energy enters the premises or somewhat more removed. It is sufficient if it is very close, which it would be if it were in a collective communal location or outside premises.

162. Third, there is no reason to think that a skilled person would make a technical distinction in the context of this patent between meters and transceivers which were respectively inside or outside the door of a dwelling.

(iii) "*the utility meter having an associated location identifier unique to the location*" [E]

163. Meter-Tech contends that this integer requires there to be a location identifier which is (a) unique; (b) associated with and possessed by the utility meter.

164. BG contends that the term is sufficiently broad to encompass an identifier which, while being unique, is not specific to the meter but is specific to a customer account which (indirectly) may uniquely identify the meter.

Discussion

165. This is an issue at the heart of the case, because Meter-Tech accepts that the main claims would be invalid in their un-amended form if the Patent is construed more broadly.

166. I marginally prefer Meter-Tech's contentions for the following reasons, albeit with the following qualifications.

167. First, as a preliminary remark, this is a divisional patent of which the description primarily relates to the "card not present" invention. There is limited teaching in the description associated with the invention claimed or this aspect of it. It does not follow that there is therefore *carte blanche* to read into the modest disclosures whatever suits a patentee to say for a case at trial.

168. Second, the 'location' is the customer premises, typically the home, although that term is sufficiently broad to encompass an identifier of the physical location of the meter rather than the meter as such.

169. Third, however, the identifier itself is described in the Patent as "a unique identifier for the utility meter to be credited". The relationship is reinforced by the purpose of the unique identifier, namely to determine a transceiver number for communication with that specific meter. This point and Meter-Tech's main skeleton argument highlight a difficulty in its argument on Claim 1. It says: "In the context of the prior art in this case, the following well defined question arises: is a customer account number such a location identifier, i.e. unique to the location and associated with the meter?" That suggests that there may be a relevant difference between an identifier of the location and of the meter (the wording underlined is of course not used in this claim). However, I think that this is not a real distinction in context. What is here meant in Claim 1 is "unique to the location of the meter".

170. Fourth, Claim 11 includes the wording "a unique identifier for the utility meter to be credited". This, is directed to the same concept as that of claim 1 of which it is the method analogue, expressed in slightly different language.

171. Fifth, taking the specification as a whole, it would be more natural to read both claims as referring to an identifier somewhat like a meter serial number (MSN) which is unique to the meter itself and thereby indirectly identifies its location, rather than something like an

MPxN which is unique only to the general physical location of the meter and not to the specific meter.

172. I do not think that a customer account number is sufficiently tied to the actual meter itself, or its location, to satisfy this requirement of the claim, albeit that, in certain systems such may well suffice uniquely to identify meters for crediting payment specifically to them. The Patent as a whole is directed to providing a means of remotely "feeding" a customer's specific pre-payment meter when it is known to be at or close to a phone communication point. For that purpose, identification of the meter itself rather than the account associated with the meter is important.

173. Sixth, one purpose of the invention requires a degree of stability of the identifier with respect to the meter. There is, however, nothing in the Patent that suggests that the identifier must be independent of the supplier and, contrary to Meter-Tech's submissions, the Patent has nothing to do with (or say about) facilitating supplier switches. It is not directed to that issue and cannot be construed as though it had that purpose in mind. It is, with respect to Meter-Tech, clearly wrong to say that "the Patent is intended to overcome such Supplier switches". Supplier switches may or may not be facilitated by the relevant regulators requiring that suppliers provide appropriate information for accessing customers or accounts. The Patent is silent on this. It would, again, be wrong to use matter not clearly disclosed in the Patent to seek to narrow the scope of the claim.

174. However, notwithstanding that point, for those reasons, in my judgment, on balance I consider that the term "the utility meter having an associated location identifier unique to the location" requires the identifier to be an identifier specifically of the meter and to identify the meter sufficiently uniquely to enable credits to be made to that meter. That accords with the language of the claim, the disclosure in the description and the purpose of the Patent.

175. On that approach, a customer account number would not fall within this integer. Somewhat puzzlingly it might be said, on this construction, an identifier which everyone agrees would identify the physical location of the meter, namely the MPxN, would also not fall within this integer. As noted, for a range of reasons, both of these identifiers might be perfectly suitable in any given system to identify a meter sufficiently to make payments to it. They are not however within the claims, on this construction.

Qualifications

176. I reject Meter-Tech's submission that the identifier "must be unique on a national basis, irrespective of supplier or the nature of the utility supplied". That is not what the claim or specification say or require. The specification does not address that issue at all, expressly or by implication. The identifier must be sufficiently unique to enable payments to be made to that particular meter. One could imagine a system using the features of the claim which was operated by a single utility company and a parallel one operated by a

different utility company in which the first utility company used numbers 1-100000 (say) for its meters and the second utility company used numbers 1-100000 (say) for its meters.

177. They would still be unique identifiers within the claim, if different suppliers had allocated the same number for the meter for which they were responsible, just as a telephone number is unique, despite the fact that someone in another country with a different country code might have the same number. A number of other examples of unique identifiers which may nonetheless have duplicates applicable elsewhere can be imagined.

178. The passages of the Patent cited to support Meter-Tech's contention in this regard (mainly p11) do not do so. The uniqueness of this number has nothing to do with independence from a supplier. An attempt to read that requirement into the claim would, in effect, result in the claim adding matter of the kind underlined in the text of Meter-Tech's submission above, which appear nowhere in the specification of the application either explicitly or implicitly, as to which see further below.

179. Meter-Tech says in its main skeleton: "this aspect of the invention receives very little explanation in the Patent itself". That is right. The reason for the paucity of description is that it is not an aspect of the invention as disclosed in the Patent. It has been sought to be retrofitted into the Patent with the assistance of Mr Pollock's *ex post facto* evidence on construction and the argumentation in this respect on behalf of Meter-Tech, which I consider to be artificial. That appears by considering the Patent itself but it is forensically reinforced by comparing the extensive text devoted to this issue in the skeleton arguments and evidence on behalf of Meter-Tech with what is actually said about this issue in the Patent, namely nothing.

180. It is wrong to construe a claim by reference to features or limitations in specific embodiments which are present in the Patent. It is equally wrong to construe a claim by reference to features or limitations which are not present at all.

181. In this context, Meter-Tech draws attention to the depiction at Fig 5 but I do not think any assistance for its argument can be obtained from this depiction of a specific embodiment.

182. It is said by Meter-Tech that the card referred to on p11 allows "somebody" to execute a pre-payment "to the meter". In particular, "someone possessing the card" in a manner which does not involve the payment passing through the user's account with the supplier. The payment goes to a "bank, supermarket or other facility", and then on to the remote communication unit. Thus the meter can receive its update without interference from the Supplier. Again that latter point is to read more into the specification than is actually there.

183. The Patent has nothing to do with removing "interference from the supplier". In so far as it is concerned with this general issue at all, the Patent is concerned with a much more

general point namely the ability to make payments for crediting a meter rather than paying users in cash who may use the money for something else.

(iv) "*remote communication unit" [G]*

184. Claim 1 of the Patent refers to a "remote communication unit" ("RCU"). That unit is required to communicate with the utility meter via a transceiver associated with the meter [integer G]; to have a database of unique identifiers and transceiver numbers [integer H]; to be subject to a signal comprising a payment for crediting the meter [integer I]; to determine the transceiver number from the unique identifier of the meter [integer J]; and to communicate with the meter via the transceiver so as to add prepayment credit to it [integer K].

185. The question here is, in effect, how "unitary" such a unit must be and, in particular, whether that functionality could be spread over more than one module in various locations.

186. I agree with Meter-Tech that there is nothing to suggest that the remote communication unit cannot be comprised of multiple modules. Nor does it matter where the modules actually are. They may all be at a supplier and there is nothing in the Patent to suggest that the unit must be remote from the supplier in any respect. Such a unit could be operated on a supplier's servers (indeed, part of Meter-Tech's case is that such a unit operated on BG's own servers would infringe). "Remote" is therefore only from either the input of the credit at the supermarket or from the meter itself (or both). I agree with Meter-Tech that the purpose of the Patent is satisfied if the remote communication unit is found in multiple discrete hardware units.

187. Meter-Tech is right that the Patent is not concerned with the details of the hardware and software deployed to create the remote communication unit and I do not accept BG's argument that "unit" requires that all of the functions of the RCU must be undertaken in a single module or co-located.

(v) "*a database of the unique identifiers and transceiver numbers" [H]*

188. The arguments here are similar to those that arise on the previous integer.

189. First, BG contends that there must be a single database held within the unit. I do not accept that argument for reasons similar to those set out above. As Meter-Tech says, there is no technical distinction between a direct mapping within the database from unique identifier to transceiver number, or a relationship established through a series of look up tables (e.g. unique identifier to attribute x (such as account number or MPxN); followed by attribute x (such as account number or MPxN) to transceiver number). Integer H does not require a direct mapping; it requires only that the necessary fields are in the database

and that one can be determined from the other. In *Improver* terms, these would also all be regarded as obvious immaterial variants of a "direct mapping" design.

190. Second, as to "transceiver number", the technical purpose of this integer as the specification explains is to enable the meter to be (in effect) phoned up to phone in a credit. The unique identifiers are cross-referenced with the "digital cellular network number for the transceiver"; that number is retrieved so that communication can be achieved with the particular meter connected to the transceiver. As Meter-Tech says, there is no basis in the Patent for excluding any such number that would be known to be suitable for arranging communication with a digital transceiver.

191. BG's additional contentions are better addressed in the context of the specific arguments on infringement in which they arise since there is a further complication to this point namely how to deal with dynamically allocated transceiver "numbers" in an IP system which do not remain constant. These are not contemplated or described in the Patent and I discuss this issue below.

(vi) *"a payment for crediting to a meter" [I]*

192. The issue that arises on this integer is quite complex. BG contends that the claim is limited to the situation where the payment itself is channelled to the remote communication unit and from there it is dealt with by the supplier's accounting system, whereupon it becomes a credit, and not a payment. Thus a distinction is sought to be made between a credit and a payment.

193. In principle, there is a distinction between a payment and a credit and the evidence to that effect is, to that extent, right. However, I do not accept that the Patent is seeking to make any real distinction between the two. The language of the Patent is not particularly precise in any respect. While in some documents written in particularly precise terms, it would be right to proceed on the basis that this distinction was material, I do not think it would be right to do so here. In simple terms, the Patent is simply saying that it is possible to make a payment remotely to the meter which ends up crediting the right meter as a result of the RCU finding the right telephone number to call up to access that meter.

194. I do not accept, as Meter-Tech contends, that Claim 1 is "not concerned with the supplier receiving money". This seems to me to be an unreal way of reading a Patent which is all about paying for energy and where the main infringement alleged involves the supplier receiving money in every case. The whole point of the invention is that the suppliers get paid and the relevant meter is credited.

Claim 11

195. There are no separate issues of construction arising on Claim 11.

AMENDMENT

Application to amend the Patent

196. Meter-Tech (more strictly Vanclare) has made a conditional application to amend the Patent. BG objected to the application as currently formulated proceeding at all on the grounds that the current version of the proposed amendments had not been properly advertised.

197. The application for permission to amend was made on 10 December 2015. The essence of the amendment sought was to add the requirement that the location identifier unique to the location be "embedded within it" to both claims 1 and 11 of the Patent. The proposed amendment was advertised by the Comptroller in the usual way. Following an extension of time granted for opposition to be filed, BG opposed amendment on a number of grounds (considered below) but no other undertaking did. Directions were subsequently given on 8 February 2016 and the amendment application was directed to be heard at the trial.

198. On 23 February 2016, BG's attorneys brought to Vanclare's attention the fact that the Statement of Grounds contained a number of errors which were identified and proposed to be corrected in a marked-up corrected Statement of Grounds. These changes were, in my judgment, trivial. They consisted of a deletion of a reference to the specification and the addition of the word "associated" to qualify "location identifier".

199. This document, as proposed to be corrected, was sent to the Comptroller, who confirmed that he had no further comments and did not wish to be represented in Court. The proposed corrected document was also sent to the court to update the file.

200. BG nonetheless contends that this approach is procedurally improper and that the amendment application should not be permitted to proceed at all. I disagree.

201. First, the proposed alteration to the wording of the amended claims is not substantial. It does not affect the amended wording and, in my judgment, would have been treated as an obvious mistake in transcribing the original text of the specification. It does not make any real difference to its allowability as to which, see further below.

202. Second, there is no reason to believe that any third party would be prejudiced as a result of this small correction being made and the application pursued. No third party opposed the Patent originally and there is no reason to think that the small change would prompt opposition which has not already been advanced.

203. Third, the error was notified to the Comptroller on 22 March 2016. In a letter shortly afterwards, he indicated that he had no comments on the proposed amendments. Although that letter does not specifically refer to the corrected text, there is no reason to

think that the Comptroller would not have had that in mind. Moreover, a considerable period has now passed since notifying the Comptroller and, if the correction merited comment from the Comptroller, he would have said so. The proposed correction is also available on the electronic file and counsel for BG accepted that third parties could have found out about the corrections through publicly available means.

204. Fourth, British Gas did not at an earlier stage in the case suggest that re-advertisment of the corrected text would be necessary. To the contrary, they were content for that to be dispensed with, on certain terms.

205. Fifth, while BG is right, in principle, to draw attention to the public interest, I am satisfied that it has, in this trial, advanced as robust and public an opposition to the amendment application as could reasonably be made by anyone else and has done so in a way that would permit third parties to bring to its attention any additional considerations. This case has been before the court on procedural hearings on a number of occasions and I am satisfied that anyone with an interest in this Patent would be well aware of it. The public interest is therefore adequately protected, inter alia, by the scrutiny that these amendments in their corrected form receive from this court.

206. Finally, refusing permission for the amendment application to proceed altogether in the circumstances would be disproportionate and would not accord with the fundamental principles of the CPR.

207. In my judgment, the correct course is therefore to consider the application on its merits and, if well founded, to allow the amendment and dispense with further advertisement.

Substantive issues on amendment

208. I will consider whether the amendments are sufficient to render the claims valid in the course of the discussion on validity more generally.

209. Apart from those objections, BG contends that the proposed amendments are not clear, not supported by the description and add matter. Since the added matter objection does not arise out of the proposed amendment of the words to claims 1 and 11, I shall consider that as a separate objection to validity below.

Lack of clarity

210. BG contends that the proposed amendment does not satisfy the requirements of section 14(5)(b) Patents Act 1977 that the claims be clear and raised a number of objections under this head in its pleadings. Only one of these was pursued at trial namely the contention that the term “embedded” proposed to be added was not clear.

211. BG submits that the fact that after a trial a court can make a decision on a specific alleged infringement does not mean that a claim meets the clarity criteria of the Act. The court,

it is said, must act as guardian of the public interest and that this demands that it must have sufficient clarity as to where the line is to be drawn going forward.

212. BG argues that there is an element of instability in Meter-Tech's own explanation of the term. On the one hand it was said in opening to mean "not readily changeable" and on the other "having a corresponding level of permanence to a metal stamped serial number". BG also draws attention to the fact that Meter-Tech's expert, Mr Pollock describes firmware as being "embedded" in his report and notes that this would be outside the definition now proposed by Meter-Tech. It makes the point that this highlights the uncertainty in the term, which cannot therefore provide "a reasonable degree of certainty for third parties".

213. BG refers to the EPO Guidelines on relative terms (F-IV, 4.6) which are as follows:

> **Relative terms**
> It is preferable not to use a relative or similar term such as "thin", "wide" or "strong" in a claim unless the term has a well-recognised meaning in the particular art, e.g. "high-frequency" in relation to an amplifier, and this is the meaning intended. Where the term has no well-recognised meaning it should, if possible, be replaced by a more precise wording found elsewhere in the original disclosure. Where there is no basis in the disclosure for a clear definition and the term is not essential having regard to the invention, it should normally be retained in the claim, because to excise it would generally lead to an extension of the subject-matter beyond the content of the application as filed - in contravention of Art. 123(2). However, an unclear term cannot be allowed in a claim if the term is essential having regard to the invention. Equally, an unclear term cannot be used by the applicant to distinguish his invention from the prior art.

214. On this basis, BG contends that there is no technical purpose to the identifier being "embedded" in the claims and that the sole purpose is to distinguish from the prior art, which is impermissible if the term is not clear.

215. Meter-Tech, on the other hand, contends that the term "embedded" is an ordinary dictionary term, albeit one which takes its meaning to some extent from its context in an electronic device. It is not a relative term as such, even though it may be possible to have degrees of "embeddedness", and that the context in which it appears makes it sufficiently clear what is meant by it. In particular Meter-Tech points to the purpose of embedding namely to provide an element of security in that it is an identifier which is difficult to change. That is consistent with the use of the term in the "card not present" invention. Having regard to those matters, the term "embedded" is, it is said, sufficiently clear. Moreover, Meter-Tech contends that the EPO Guidelines do not preclude the use of relative terms but merely state a preference against them.

Discussion

216. I accept Meter-Tech's arguments on this point, albeit with some hesitation.

217. Although it is true that the term "embedded" in the context of an electronic identifier is capable of some flexibility of meaning, in the claims of the Patent as proposed to be amended, it is sufficiently clear what is meant.

218. The concept is also explained in the specification, from which it is sufficiently clear that it requires that the identifier be stored in memory in the meter in some permanent or semi-permanent form in such a way that it is readable by the relevant software but also securely associated (in electronic terms) with the meter in question.

219. I am not persuaded that it requires the identifier to be completely unchangeable, any more than a meter serial number or other means of identifying a meter is completely unchangeable, but it is important for the purpose of the invention that it is associated with the meter in some way (in the Patent, electronically) in an electronic analogue of a serial number stamped on a meter.

Reservations

220. My reservations come from the manner in which the infringement claim was advanced and that which was said to differentiate the various alleged systems. Meter-Tech appeared to contend that a system which employed an identifier for the meter which is:

> "programmed into the meter during factory configuration"

did not satisfy the requirement of being "embedded". This is how the meters are described which are said by Meter-Tech not to infringe the claims as proposed to be amended (see p133 of the description of the E-470 Tokenless Smart Prepayment Meter at Annex 6 to the Particulars of Infringement).

221. On the other hand, Meter-Tech contends that a system which employs a GUID does satisfy that requirement. The GUID is described in the SMIP End to End Technical Architecture – 1006 at Annex H to the Particulars of Infringement as:

> "tightly bound to the Device that it identifies by physical means (for example, a bar code etched in the device casing) and by electronic means (for example a "write once" data item set at manufacture)".

222. This is to draw rather a fine distinction between the non-embedded and the embedded. Given the case advanced and, more particularly the case not advanced, on infringement, that leads to some uncertainty since the identifiers of the meters which are alleged by Meter-Tech not to be "embedded" are also a property of the meter and are allocated to it on manufacture.

223. The instability in Meter-Tech's position is further highlighted by the fact that Meter-Tech contends that the purpose of the "embedded" requirement is "to further clarify that the unique identifier of the claim is a property of the meter and not of the customer". Meter-Tech additionally contends that such an identifier need not be completely unchangeable. However, on that approach, an "embedded" identifier might be altered while remaining a property of the meter and not the customer. For example, one could envisage a controller of such a system changing all of the identifiers of the meters themselves from time to time to enhance the collective system security, in an electronic analogue to changing all the locks or combinations of a safe-storage system now and again.

224. Accordingly, if the question for the court was whether the manner in which the case was advanced by Meter-Tech had diminished the clarity of the term proposed to be introduced by amendment, I would hold that it had. But that is not the question. The court is obliged to consider whether, regardless of what is or is not said about a term during the course of litigation, it is sufficiently clear in the context of the claims to satisfy s.14 of the Act. The fact that there may be a debate as to what falls within the claim is not of itself sufficient to render it unclear in the context of this particular Patent. On balance, I consider that it is sufficiently clear, having regard to the context in which the term is used. I note also that the Comptroller did not object to the proposed amendment on the grounds of lack of clarity.

225. Accordingly, I reject this objection to the proposed amendment. As indicated above, the issue of whether the amendments validate the claim is considered separately.

INFRINGEMENT

Law on infringement

226. Section 60, Patents Act 1977 provides:

> "60. (1) Subject to the provisions of this section, a person infringes a patent for an invention if, but only if, while the patent is in force, he does any of the following things in the United Kingdom in relation to the invention without the consent of the proprietor of the patent, that is to say –
>
> (a) where the invention is a product, he makes, disposes of, offers to dispose of, uses or imports the product or keeps it whether for disposal or otherwise;
>
> (b) where the invention is a process, he uses the process or he offers it for use in the United Kingdom when he knows, or it is obvious to a reasonable person in the circumstances, that its use there without the consent of the proprietor would be an infringement of the patent;
>
> …
>
> (2) Subject to the following provisions of this section, a person (other than the proprietor of the patent) also infringes a patent for an invention if, while the patent is in force and without the consent of the proprietor, he supplies or offers to supply in the

United Kingdom a person other than a licensee or other person entitled to work the invention with any of the means, relating to an essential element of the invention, for putting the invention into effect when he knows, or it is obvious to a reasonable person in the circumstances, that those means are suitable for putting, and are intended to put, the invention into effect in the United Kingdom."

227. Infringement is alleged under both s.60(1) and s.60(2).

Law relating to the experimental use defence

228. British Gas contends that all of the past and current acts of alleged infringement are entitled to the defence provided for by Section 60(5)(b) of the 1977 Act. That sub-section provides:

> "(5) An act which, apart from this subsection, would constitute an infringement of a patent for an invention shall not do so if … (b) it is done for experimental purposes relating to the subject-matter of the invention;…"

229. For this defence to apply, it is necessary for a defendant to show that an act satisfies two requirements. First, the act which would otherwise constitute infringement must be done for "experimental purposes". Second, those must be related to the subject of the invention. Those are the acts referred to in s.60 of the Act (i.e. the acts of making, disposing of and so forth).

230. Notwithstanding the fact that the subsection is expressed to be an exception to protection, in my judgment, it is necessary to construe it as providing for a specific defence, with the consequence that the defendant bears the burden of establishing both those matters.

Experimental purposes

231. This requirement was considered by the Court of Appeal in *Monsanto Co. v Stauffer Chemical Co. and Another* [1985] R.P.C. 515. That case concerned a herbicide product which was required to go through four stages of testing in order to achieve regulatory approval for a full commercial launch. The defendant carried out testing in laboratories and glasshouses, on a larger scale on its farm in Essex, and on a larger scale still on third party farms. At p538, Dillon LJ (with whom the Court agreed) rejected the submission that the words "for experimental purposes" are limited to experiments in laboratories or glasshouses. He held that the line falls between 'discovery' and 'demonstration', and in this case the experiments on the defendant's own farms were within the statutory exception, but those on third party farms were not. At page 542 he said:

> "Trials carried out in order to discover something unknown or to test a hypothesis or even in order to find out whether something which is known to work in specific conditions, e.g. of soil or weather, will work in different conditions can fairly, in my judgment, be regarded as experiments. But trials carried out in order to demonstrate to a third party

> that a product works or, in order to amass information to satisfy a third party, whether a customer or a body such as the PSPS or ACAS, that the product works as its maker claims are not, in my judgment, to be regarded as acts done "for experimental purposes". The purposes for which tests or trials are carried out may in some cases be mixed and may in some cases be difficult to discern…"

232. The issue of mixed purposes was considered again in *Corevalve Inc v Edwards Lifesciences AG* [2009] EWHC 6 (Pat) at paragraphs 72 to 81 where Peter Prescott QC, sitting as a Deputy High Court Judge said:

> "73…The Federal Supreme Court of Germany considered the equivalent provision in *Klinische Versuche (Clinical Trials) I* [1997] RPC 623. The only part of the court's official headnote that is relevant for present purposes is as follows (English translation):
>
> An act for experimental purposes which is related to the subject-matter of the invention and therefore legitimate can exist if a patented pharmaceutically active substance is used in clinical trials with the aim of finding whether and, where appropriate, in what form the active substance is suitable for curing or alleviating certain other human diseases.
>
> 74. In that case the substance in question (an interferon) was known for use in the treatment of rheumatoid arthritis and the defendants were conducting clinical trials to see if that substance could be used for treating other diseases such as cancer, AIDS and hepatitis. The invention – the thing that was claimed in the patent – was the substance as such. I can see that those clinical trials were squarely within the purpose of the exception, for their immediate purpose was to generate scientific information by experimenting with the substance that was the subject of the patent claim.
>
> 75. However, there must surely be an outward limit to that principle. Suppose the defendants in the German case had been selling a pharmaceutical that was fairly new to the market and their defence had been that, by so doing, they were gaining valuable information that was not otherwise available – contraindications, for instance, which could be stated in the product literature. Would that be acts done for 'experimental' purposes?
>
> 76. A defendant could always say, and with some truth, that by putting his product on the market (general or special) he was gaining valuable information that might even prompt him to modify his device in future. I have referred to Henry Ford's Model T car. I dare say that vehicle went through various modifications in the light of experience on the roads of early twentieth century America, and that is usually the case with any engineering product.

77. I acknowledge that the mere fact that the purpose of the defendant is commercial is no rebuttal of the statutory defence. After all, most pharmaceutical research organisations are commercial. They do research because they hope to make money one day. However, in the present case it cannot be denied that an immediate and present purpose of CoreValve is to generate revenue – which was not so in the German case.

78. I therefore think that a more complete statement of the principle – it did not arise in the German case – should involve the consideration whether the immediate purpose of the transaction in question is to generate revenue.

79. The relevant statutory phrase is "acts done for experimental purposes". The difficulty arises where the defendant has mixed purposes. I would reject the extreme proposition that, so long as one of the defendant's purposes is to generate information of scientific or technical value, it is irrelevant that another of his purposes is to generate ready cash. There may be no help for it but to consider the defendant's preponderant purposes.

80. On the evidence in this case I would hold that CoreValve's purposes are threefold: (1) to establish confidence in their product within the relevant market; (2) to generate immediate revenue of a substantial character; and (3) to gain information about clinical indications and, possibly, future modifications to be made to the physical structure of the device in the light of experience. I do not find that purpose (3) was their preponderant purpose.

81. I have not found this point easy, but on the whole I would hold that, on the assumption that the CoreValve device falls within Claim 1 of the patent in suit, section 60(5)(b) of the Patents Act 1977 is not a valid defence on the facts of this case."

233. The Deputy Judge in that case treated the test as requiring a multi-factorial evaluation in which significant weight was to be given to whether the acts in question were predominantly to find out information about how and in what circumstances the invention worked.

234. The approach taken by the Bundesgerichtshof in *Klinische Versuche (Clinical Trials) II (Case X ZR 68/94)* [1998] RPC 423 is similar, in that the German court found it impossible to draw a "handy demarcation" as to the degree of commercial intention required albeit that it made it clear that the presence of some commercial purpose was not fatal to the defence (see p437). That case emphasised that the relevant provisions of German law were designed to encourage (or not hamper) genuine scientific research. On the facts of that case, it was impossible, without undertaking human trials, to establish whether the active agent the subject of the patent actually fulfilled the promise of the patent (see p436). The defence was held to apply.

Discussion

235. Although it is tempting to place a gloss on the statutory wording, in my judgment that would not be appropriate. The evaluation in each case involves consideration of a range of factors of which the following are some:

a. Whether the acts in question are properly characterized as trials and whether those trials can be described as undertaking scientific or development research;
b. Whether the trials were carried out in order to discover something technically unknown or to test a technical hypothesis or whether they were carried out to discover whether the product was commercially acceptable to the market;
c. Whether the trials were intended to find out whether something which was known to work in specific conditions would work in different conditions and, in the case of a system intended to operate on a large scale, whether it was capable of operating on such a scale;
d. Whether the trials were carried out mainly in order to demonstrate or collect information to demonstrate to a third party customer or regulator that a product works – which points away;
e. Whether the purpose of the trial was mainly directly or indirectly to generate revenue as a result of the use of the invention in the trial itself – which points away.

236. It is, in my judgment, impossible to allocate a precise ranking to the importance of these factors and the evaluation must take an overall view. Moreover, the court must take into account the extent to which the acts undertaken were reasonably necessary to determine the facts sought to be determined. A small-scale trial of a product may be treated as involving acts done for experimental purposes whereas the supply of a product in quantities far beyond that required to find out how it worked in certain conditions may not do so.

"Relating to the subject matter of the invention"

237. The second requirement is that the act must be done for purposes relating to the subject matter of the invention found in the claims alleged to be infringed (see per Aldous J in *SK&F v. Evans Medical* [1989] 1 FSR 513 at 523). The requirement that the purposes "relate to" the subject matter of the invention means that there must be a real and direct relationship with the subject matter of the claimed subject matter (id.).

238. This too requires the court to take an overall view. One factor which may be important is the extent to which an alleged infringer is testing a product designed by a third party designer of such products to determine whether that product is suitable for the alleged infringer's use or whether the alleged infringer is testing a product with a view to further development of the subject matter of the patent – i.e. real research to take that sort of design forward.

239. An undertaking may buy and test a range of commercially available equipment, of which some may have patent protection, to work out which was most suitable for its purposes. To that extent, they may be trialling it. However, the fact that the undertaking was testing those products to see whether (for example) the invention resulted in a better product than one without, would not inevitably mean that the defence would apply.

INFRINGEMENT AND EXPERIMENTAL USE DEFENCE – FACTS

General points

240. I have determined above the correct construction of the claims and I shall apply that construction and the principles set out above to the issue of whether the acts are entitled to the statutory defence.

241. Common to each of the systems is a facility for remote crediting of a pre-payment meter which involves sending a message of some kind over a wireless link to that meter using an appropriate transceiver to receive the message. Each system uses (or may use, when activated) a means of identification which is unique to the particular meter so that payment can be sent to the correct meter. To that extent, each of the systems makes use of the overall architecture of claims 1 and 11. Equally, to a greater or lesser extent, each of the systems in question may be characterised as trials.

242. Infringement of the product/system claim 1 pursuant to s60 (1) (a) is alleged on the basis of making, using and/or keeping a prepayment energy supply system. Infringement of the process/method claim 11 pursuant to s60 (1) (b) is alleged on the basis of using and/or offering to use a prepayment energy supply method.

Installed systems – general

243. There are two categories of installed systems, the "SMS System" (in two versions), and the "GPRS System". The SMS Systems use Short Message Service messages ('SMS messages' or 'text messages') to send information to the meter. There are two variants known as 'Dual Prepay' and 'Phase 2B Dual Prepay'. The GPRS System employs both the Short Message Service and the General Packet Radio Service ("GPRS") for communication with the meters.

244. The meters of the Dual Prepay System were removed in July 2010 but many Phase 2B Dual Prepay meters remain in operation. Meters in the GPRS System continue to be installed. Installation and use of each of the installed systems is admitted (see paragraphs 5(2)-(4) of the Defence). Accordingly, it is not in dispute that BG has undertaken acts falling within s60 (1) (a) and (b) in relation to these systems.

245. The real dispute is whether the installed systems have all of the integers of claims 1 and 11 and whether there is a defence of experimental use in respect of the acts in question.

On the basis of the disclosure provided by BG, Meter-Tech does not contend that the installed systems infringe the Patent in the proposed amended form. It is therefore only necessary to consider claims 1 and 11 as granted for these.

A. Past and currently installed systems

(i) Dual Prepay – infringement of Claims 1 and 11

246. There is no detailed statement of case on infringement of the Dual Prepay. The relevant document is the description of the system in the PPD at paragraphs 12-21.

247. There is no dispute over **integers A and B.** Paragraphs 12(a) and (b) of the PPD make it clear that the Dual Prepay system is a prepayment system including prepayment meters. **Integer C** requires the presence of a digital cellular transceiver. The Dual Prepay system includes a PRI Communications Hub which incorporates a GSM modem communicating via Short Message Service messaging. In my judgment, SMS messaging over GSM is properly regarded as a kind of two-way digital cellular communication. The GSM modem is the relevant transceiver. **Integer D** requires that the digital cellular transceiver be provided at a location to be supplied with energy. This requirement is also satisfied. I do not see any substance in the suggestion that the fact that the meter may be sited in a communal location means that it is not provided at a location to be supplied with energy but, in any event, at least some such meters have been supplied at locations which are non-communal and are clearly at the location to be supplied with energy. **Integer E** is satisfied by the Payment Card Number (PCN), with which all Dual Prepay customers were issued. It is important to note that this was the same number allocated to the meter in question for the purpose of this system. It is not the meter serial number but a new number for this purpose. Each meter had its own different PCN (see PPD, paragraph 17(c)) which was different from the customer account number. **Integer F** requires the meter to have a memory for storing prepayment credits. This is admitted.

248. As to **Integer G,** the RCU is said by Meter-Tech to be the Liberty System identified in paragraph 12(a) of the PPD. I do not consider that a system falls outside the claim if the RCU is made up of two sub-modules (in this case, LibAudit/LibClient) and accordingly may be regarded as two units rather than a single-module remote communication unit. That is so whether one approaches the question on the basis of the true construction of the claim or by application of the *Improver* principles. There is nothing in the patent to limit the claim to a single-module RCU and, in my judgment this is an obviously immaterial variant not excluded by the express wording of the claim. This integer is therefore present.

249. The mode of operation is described at paragraph 19 of the PPD which shows that the meter to which credit is provided is identified by means of the unique PCN. The payment request is sent to the Liberty System as shown in paragraphs 19(a) and (b). No other meter identifier is disclosed as being sent to the Liberty System. The Liberty System

generates a Vend Code, determines the SIM card identifier of the PRI Metering System (i.e. of the GSM modem), packages the Vend Code into an SMS, and sends it over the GSM interface for crediting the appropriate meter via the message sent by SMS to the transceiver identified by the SIM card identifier.

250. I agree with Meter-Tech that this process and the system which implements it satisfies integers H – K of the claim. As to **Integer H**, the Liberty System must have some sort of database containing PCNs and SIM card identifiers otherwise it could not match the PCN to the relevant SIM address. The SIM card identifier is the transceiver number being the number of the SIM card that is incorporated into the GSM modem. As to **Integer I**, the payment for crediting to the meter is made by a signal which includes the unique identifier, the PCN. As to **Integer J**, it is to be inferred that the Liberty System determines the SIM card identifier from the PCN. As Meter-Tech says, that is the only way such a system could work. As to **Integer K,** the SMS containing the Vend Code is sent to the meter via the GSM modem, with the result that the prepayment amount is credited to the meter.

251. I conclude that the Dual Prepay system falls within the scope of claims 1 and 11 of the Patent as unamended.

(ii) Phase 2B Dual Prepay – Infringement of claims 1 and 11

252. The PPD (paragraph 22) and the diagram at ALJ-48 provide sufficient details of the operation of the Phase 2B Dual Prepay system. This is reproduced at **Annex 3** hereto.

253. **Integers A and B.** There is no dispute that this prepayment system incorporated prepayment utility meters. However, the meters of the Phase 2B Dual Prepay System were capable of operation in both prepayment and credit modes. BG therefore contends that a meter not in fact operating in prepayment mode is not a "prepayment utility meter" within integer B, and is not part of a "prepayment energy supply system" within the meaning of integer A. I have addressed the issue in the construction section above. It is not a requirement of the claims that the meters in question operate solely as pre-payment meters or that the pre-payment functionality is activated provided that it is capable of being activated. The following matters provide further support for the argument that such a meter/system should properly be regarded as a pre-payment meter/system.

a. First, the electricity meter of the Phase 2B Dual Prepay System was a Landis+Gyr model E470. The manual for this meter describes this as an 'E470 Tokenless Smart Prepayment Meter' and the manual describes several different operational modes which it states "can be implemented remotely". As to pre-payment mode, the manual states:

> "The meter can be configured to operate in prepayment mode. In this mode of operation the meter will open the contactor when the credit value in the meter falls below a zero value"

b. Second, such meters could, by apparently simple signalling, be readily switched to pre-payment mode, even if initially installed as operating in credit mode. BG has not undertaken to operate these meters exclusively in credit mode (or any mode other than pre-payment mode).

254. In my judgment, a meter with this facility satisfies these integers with respect to the meters.

255. BG contends that a system in which such a meter is installed does not become a pre-payment energy system until the meter is configured in pre-payment mode. I do not accept that. It may be such a system even though none of the meters are activated at all but can be switched into such a mode.

256. **Integer C.** As in the Dual Prepay installed system, Meter-Tech relies on the GSM modem as the digital cellular transceiver which is integrated into the electricity meter of the Phase 2B Dual Prepay system (see PPD paragraph 24). Similarly, the transceiver number relied upon is the telephone number of the GSM modem (i.e. of the SIM card contained in the GSM modem). I consider that the position is therefore the same as for the Dual Prepay. This integer is present. As to **Integer D**, here too the position is the same as for Dual Prepay and this integer is present. I am not satisfied that there is any distinction to be drawn between the gas and electricity meters. The Electricity meter includes an integral GSM modem, the gas meter does not (see PPD paragraph 24). As Meter-Tech says, claim 1 does not require each utility meter to have a transceiver. This integer is satisfied regardless of whether the transceiver is in the meter or not and regardless of whether each meter has its own transceiver.

257. As to **Integer E**, customers were issued a 19-digit Smart Card Number (SCN) for each meter (see PPD, paragraph 26). The position is the same as for Dual Prepay and this integer is satisfied. **Integer F** is admitted (see PPD, paragraph 24).

258. **Integers G, H, I, J and K** - The method by which prepayment is added to the meter is described in paragraph 28 of the PPD and represented pictorially in ALJ-48. The key points are as follows using the arrow numbers in ALJ-48 (see **Annex 2)** in the form "[**x**]":

a. The payment signal sent from the Point of Sale (POS) to the prepayment system contains the SCN [**1**]. If the message is in the correct ISO format it is forwarded to the Vend Management System (VMS) and elsewhere for the processing of the payment in a manner which does not matter for this case.
b. The VMS is run on a BG server (PPD, paragraph 22(b)), and contains data including a mapping of SCN to MPxN (PPD, paragraph 27(b) and ALJ-48). The VMS uses a separate vend code generation module to generate a vend code ([**3**] and [**4**] in ALJ-48), translates the SCN into the MPxN, and forwards the vend code to the separate Head End Server (HES) together with the MPxN.

c. The HES is also run on a BG server (PPD, paragraph 22(c)). It contains data including a mapping of MPxN to the telephone number of the GSM modem (PPD, paragraph 27(c) and ALJ-48). The HES looks up the telephone number of the GSM modem from the MPxN (PPD, paragraph 28(h))
d. The HES then generates a SMS message containing the Vend Code (PPD paragraphs 28(i)-(j)) [**6**] and [**7**] in ALJ-48), and sends that message to the telephone number of the meter (PPD paragraph 28(k), [**8**] of ALJ-48).
e. The resulting effect is to top up the appropriate meter (PPD, paragraphs 28(m)-(n)).

259. I have set out the above substantially from Meter-Tech's skeleton argument (with some references corrected) but it is as easy to consider the visual depiction in ALJ-48 to determine whether the relevant integers are satisfied.

260. **Integer G.** Meter-Tech contends that the "remote communication unit" is the system operated by British Gas on its own servers to effect the prepayment operation – namely the combination of the VMS and the HES. This combination communicates with the meter via the GSM modem. I agree with Meter-Tech that this combination can properly be treated as a "unit" for the purpose of the claims.

261. **Integer H**. The data in the system includes unique identifiers and transceiver numbers as required by the claim. If the RCU can be formed of the combination of the VMS and HES, then that combination contains the required database. The fact that this is achieved by mapping SCN to MPxN and MPxN to telephone number is immaterial.

262. **Integer I** – The message sent to the VMS to credit the meter includes the SCN. As to **Integer J** – The RCU uses the database of integer H to determine the telephone number from the SCN and, for **Integer K** – this results in adding the appropriate payment credits to the memory of the meter.

263. I conclude that the Phase 2B Dual Prepay system falls within the scope of claims 1 and 11 of the Patent as unamended.

(iii) GPRS installed system

264. Because the details of this are confidential, I address the details of the infringement case in a confidential annex (**Annex 3**).

265. I conclude that the GPRS installed system would fall within the scope of claims 1 and 11 (as unamended) if they were valid.

Experimental purposes – installed systems

266. British Gas adduced evidence dealing with the various installed systems as follows:

a. Evidence from Ms Theresa McGrath, currently Change Manager in the Smart Foundation Programme of BG who addressed Dual Prepay. At the relevant time (2008-2010) she had senior roles in BG including that of SmartMetering Trialing Manager.
b. In-part-confidential, evidence of Edward Hurford and exhibits which addressed Phase 2B Dual Prepay and GPRS
c. In part confidential evidence of Ms Helena Chaffer, who addressed GPRS.

267. There was limited cross-examination on the factual evidence and no criticism of the witnesses although Meter-Tech pointed out that the materials exhibited concerning the technical results of the various trials was not complete. I found no reason to doubt any of the evidence that they gave and the issue did not turn on the correctness of it but rather what conclusions should be drawn, having regard to the various factors identified above. In view of the confidentiality, in the public version of the judgment, the Annexes dealing with confidential matters below will be redacted to the extent that they are confidential.

(i) Experimental use defence - Dual Prepay

268. Prior to Dual Prepay trial, BG engaged in various trials of other metering systems. Ms McGrath was closely involved in the planning and execution of trials of the Dual Prepay meters supplied by a meter manufacturer called PRI and supported by a central communications server called Liberty, run by PRI. She says, and I accept that BG began the trial in order to explore the technologies required for a smart metering system. The primary objective, as recorded in a contemporary presentation was to develop a "robust and scaleable end to end solution for the deployment of smart meters." In the context of BG's customers, a relatively small number were ordered and even fewer (120) installed. One of the capabilities to be explored was the remote crediting of meters or e-payment.

269. This was, in my judgment, a trial directly of a system falling within the scope of the claims but it does not follow that the trial was undertaken for experimental purposes related to the subject matter of the invention.

270. I have considered the evidence as a whole, including the various documents in K4 which describe the trial at some level of generality. There is comparatively little in that material which is really technical in character. The key focus is on acceptability of the kinds of metering to the public, including things like installation times. Moreover, BG was, for that trial, testing a system which had been designed and built by a third party PRI. There are no documents indicating that BG was undertaking research of a kind directed to improving the design of the smart metering system supplied and operated by PRI.

271. However, the trial was unquestionably a genuine trial and it is clear that part of the learning from it was related to the technology "We've learnt a lot around the technology and functions" was one observation. Moreover, it is clear from the evidence that one purpose of the trials was to determine whether the meters and systems were usable in a live environment. I think it went beyond something that could be described as a

demonstration, although the boundary between a large scale pilot designed to test acceptability and a demonstration of acceptability is not a very clear one.

272. Looking at the matter in the round and having regard to the various factors identified above and the fact that "mixed" purposes, including a commercial element, may still be experimental, I consider that this was a use for experimental purposes.

Related to the subject of the invention

273. However, I do not consider that BG, on whom the burden lies, has shown that these purposes were directly related to the subject matter of the claims of the Patent.

274. First, this was a trial by a customer of a ready-made system of which the original contract was for 1000 meters (with a smaller number actually installed). Second, there is no technical documentation exhibited or in disclosure from BG showing (for example) communications with the designer/manufacturer of the meters discussing (for example) improvements to the metering system. Third, this appears to have been a test primarily of the suitability of the meters and metering system for BG's purposes rather than the conduct of genuine research relating to the development of improvements in metering. Fourth, I am not satisfied that there is a sufficiently direct link between the purposes for which the products/systems were used and the subject matter of the claim.

275. Accordingly, in my judgment the defence of experimental use is not made out. The issue of experimental use of the other installed systems is addressed in the confidential annex.

B. Future SMIP system

276. Because of the scale of the proposed roll out, the heart of the commercial dispute concerns the so-called future system. Meter-Tech contends that by complying with its legal and contractual obligations regarding SMIP, BG will infringe the Patent. There is no dispute that BG intends to comply with those obligations. The dispute is whether the future SMIP systems fall within the claims. Infringement is alleged both indirectly under s60 (2) and directly by common design. Regarding indirect infringement, BG accepts that it will be liable under s60 (2) if the SMIP future system falls within the claims of the Patent.

Future SMIP system – infringement of claim 1 (as granted and as amended)

277. Metertech served a Statement of Case on essentiality by reference to a number of legal and technical documents relating to SMIP, identifying the features of SMETS2 falling within the claims of the Patent. British Gas responded admitting or denying the presence of those features in its Future System. British Gas was then ordered to provide a PPD on the functionality of the Future Systems which was not admitted to be covered by the SMETS2 documentation. The matter was dealt with in greatest detail by Mr James and shown diagrammatically at ALJ-47 (**Annex 2**).

278. It is convenient to summarise the aspects of the case where there is no dispute, largely derived from the summary in Mr James' evidence.

279. First, the equipment at the user's premises is proposed to include gas and electricity smart meters, referred to as Gas and Electricity Smart Metering Equipment (GSME and ESME). Each such meter has a EUI-64 globally unique identifier (GUID). This GUID is a 64-bit identifier that uses the Institute of Electrical and Electronics Engineers (IEEE) 64-bit Global Identifier (EUI-64) standard.

280. Second, the premises are proposed to be provided with a Communications Hub, which is identified using a Comms Hub Identifier.

281. Third, although a large number of meters are proposed to be installed as credit meters, the meters are proposed to be switchable to pre-pay meters in the manner discussed previously. In the case of meters operating as pre-pay meters, a customer pays for energy at a suitable Point of Sale (POS). A signal is then sent from the POS to the supplier (shown as arrow 1 in ALJ-47).

282. Fourth, from the signal, the supplier constructs a prepayment vend code, known as a unique transaction reference number ('UTRN'), which is then returned to the customer at the POS (see ALJ-47).

283. Fifth, this UTRN is also forwarded by the supplier to the DCC (see arrow 2 in ALJ-47). That forwarding message includes a 'Business Target ID', which contains the EUI-64 GUID of the meter. The DCC is comprised of two sections – a Data Services Provider (DSP) and a Communications Services Provider (CSP) (see ALJ-47 which contains an error in that the dotted box headed 'Data Communications Company (DCC)' contains within it a solid box also headed 'Data Communications Company (DCC)'). This latter 'sub-box' should be headed 'Data Services Provider (DSP)'. The DSP maintains a mapping table between the GUID of the meter and the Comms Hub Identifier.

284. Sixth, the message, including both the UTRN and the Business Target ID, is passed from the DSP to the CSP. The CSP looks up the Business Target ID and forwards the message to the appropriate Communications Hub (see arrows 4/5 in ALJ-47) and the credit is added to the meter.

Integers of the claims

285. **Integers A and B.** For the reasons given above in the section on construction, I do not consider that the fact that some of the meters may originally be supplied as credit rather than configured as pre-payment meters means that there is no infringement. There is no dispute that at least some of the meters will be configured as pre-payment meters. The SMETS system requires that both gas meters (GSME) and electricity meters (ESME) are

able to operate in credit mode and prepayment mode, with the facility to switch remotely between the two.

286. **Integer C.** The digital cellular transceiver of this integer is the Communications Hub. However, BG intends to use two types of Communications Hub – one which contains a cellular transceiver only, and one which contains both a cellular and a mesh transceiver. BG therefore does not accept that the Communications Hub is a digital cellular transceiver.

287. I do not accept this argument. In my judgment, a transceiver which is capable of operating as a cellular transceiver and a mesh transceiver is nonetheless a digital cellular transceiver. Accordingly, in my judgment the transceiver number identifies a digital cellular transceiver.

288. There is however a point of some subtlety advanced by BG in this regard. It draws attention to the fact that, in some areas of the UK, the relevant communications are embodied by long range radio and not by a digital cellular WAN. Accordingly, the relevant number would (in the radio implementation) not identify a digital cellular transceiver. Meter-Tech does not suggest that a system which operates only by way of long range radio and not by means of a digital cellular transceiver would infringe, nor could it, given the wording of the claims.

289. This too is an issue which goes to the extent of infringement rather than whether there is infringement at all. Claim 1 is a claim to a system and, if it includes a digital cellular transceiver as part of it, there would be infringement (subject to satisfying other integers) even if some of the users had communication hubs which did not operate on a digital cellular network. However, again, if it came to the issue of payment in respect of the use of the invention, some account would need to be taken of the extent to which communication was effected in a manner which did not make use of the integers of the claim. By way of example, if one imagined a network in which 15 million of the meters operated by way of long range radio and 1 million by digital cellular, it may not, prima facie, be correct to provide compensation at the same level as one in which (say) almost all of the 16 million meters operated by way of a digital cellular network although precisely how account should be taken if it came to that of a system which used some infringing and some non-infringing means of communication may not be straightforward.

290. **Integer D.** This integer is satisfied (see above as to the point on siting in communal locations).

291. **Integer E.** Meter-Tech contends that the unique identifier is the EUI-64 GUID of the meter and there is no dispute that this is a unique identifier of the meter. This was originally denied but does not seem really to be in dispute.

292. **Integer F** is admitted.

293. **Integer G.** BG contends that there is no "remote communication unit" because there is no single unit under a single control and the DCC is composed of the DSP and three CSPs. For the reasons given in the section on construction, I do not consider that the claim, interpreted in the light of the description, requires that this unit be a single entity. In my judgment it is right to consider the DCC, or more strictly, the equipment operated by the DCC, as a unit entity albeit with separate sub-units and that it can properly be regarded as the remote communication unit of this integer. I do not think it makes sense to treat the individual sub-units as the remote communication unit. Taken individually, they do not each contain all of the relevant databases. I do not accept BG's argument that the fact that the sub-units are under different "control" (which is itself a term somewhat difficult to define) makes a difference.

294. **Integer H.** There is no dispute that the DSP maintains a list of mappings of GUID:Comms Hub Identifier, and therefore has a database with these included. The CSP also has a database of these identifiers. As noted above, BG does not accept that the Comms Hub Identifier is a "transceiver number" because it is not necessarily always a number of a digital cellular transceiver. However, I do not consider that it is necessary for that to be the case for every transceiver for the system as a whole to satisfy this integer.

Dynamically assigned IP addresses

295. The Communication Hubs data sheets for the SMIP systems indicate that the hubs in question are dynamically assigned IP addresses which are used for communication.

296. This issue and the consequences of it were not fully developed in either side's case before trial. I have dealt with it elsewhere in connection with the GPRS systems (see confidential Annex). Counsel for Meter-Tech acknowledged that there may be difficulties in asserting an infringement case in respect of such addresses because in such a system there is no fixed database mapping unique meter identifiers and transceiver numbers. In essence, "numbers" for the transceivers are only allocated when needed to identify them for the purpose of a particular communication.

297. I am not, however, persuaded that this gives rise to an additional non-infringement point.

298. First, it has not been properly explored and the BG description of the future system does not go into this issue. In my judgment it would not be right to base a decision of non-infringement on a point developed in this way at a very late stage of the case and which was said in closing to be a "possible further point of non-infringement".

299. Second, I do not think that it is right in any event. A dynamically allocated IP address is, of course, not a fixed transceiver number as the Patent describes but the Patent does not attribute any particular significance to the transceiver number being fixed. What matters for the purpose of the invention is that there is a determinable relationship between the

transceiver number and the meter so that the system as a whole knows which number it should be "calling" to update that meter. For that purpose, it does not matter whether the transceiver number is permanently fixed or whether, even, it changes during the course of a transaction, so long as the system as a whole keeps track of the relevant relationships. I am therefore satisfied that in the future systems, this integer is likely to be present.

300. **Integer I.** The message that is sent to the DSP (and hence to the DCC) (namely, arrow 2 in ALJ-47) includes the Business Target ID, which includes the GUID of the meter. The message that is sent to the CSP from the DSP (arrow 4 in ALJ-47) also includes the Business Target ID. This integer is satisfied on either basis.

301. However, BG contends that the payment in this case is made to the supplier and a credit is then transferred to the meter. BG contends that the payment will be accompanied by a smart card number to identify the ultimate meter for which it is intended. BG will extract the payment and then credit the meter by using a "Top UP Device" Command to the DCC. The process of getting the meter credited is therefore indirect and involves intermediate steps. BG contends, in effect, that the Patent does not contemplate such an approach to crediting the meter and only contemplates a direct crediting. I am not persuaded that this is correct.

302. **Integer J.** The mapping table in the DSP is arranged so as to determine the Comms Hub ID from the GUID. Furthermore, the CSP carries out the same function. In my judgment, integer J is satisfied. I deal with the common design aspect of this argument below.

303. **Integer K** is admitted.

304. Accordingly the future systems would infringe claim 1 of the Patent if valid.

The amended claims - "embedded"

305. The proposed amended claim adds the requirement that the unique identifier be "embedded" in the meter. The SMIP end-to-end technical architecture (8.1.1.33) states that the GUIDs are "tightly bound to the [meters] by physical means… and by electronic means (for example, a "write once" data item set at manufacture.)" In my judgment, even given some uncertainty concerning the meaning of embedded discussed above, this is sufficient to satisfy this integer.

Claim 11

306. If the future systems satisfy claim 1, the method of operation will, in my judgment also satisfy claim 11.

Common design

307. Meter-Tech also alleges infringement by BG by common design.

308. Meter-Tech's case is that by signing up to SMIP and agreeing to deliver a SMETS2-compliant system compatible with the DCC, British Gas has engaged in a common design with the DCC. British Gas accepts it is working with the DCC to implement the relevant systems but it denies that such acts amount to a common design as a matter of law. The Defence admits the specific acts alleged in relation to the Future Systems (paragraph 5F1(ii)), but denies that those acts amount to joint tortfeasance by common design with the DCC.

Law

309. The law is not in dispute. In *Unilever Plc. v Gillette (U.K.) Limited* [1989] R.P.C. 583, Mustill LJ set out the requirements. First, has there been a common design to do an act which is held to infringe. Second, has the defendant acted in the furtherance of that design. As Meter-Tech notes, he went on to say (at 609):

> "I use the words "common design" because they are readily to hand, but there are other expressions in the cases, such as "concerted action" or "agreed on common action" which will serve just as well. The words are not to be construed as if they formed part of a statute. They all convey the same idea. This idea does not, as it seems to me, call for any finding that the secondary party has explicitly mapped out a plan with the primary offender. Their tacit agreement will be sufficient. Nor, as it seems to me, is there any need for a common design to infringe. It is enough if the parties combine to secure the doing of acts which in the event prove to be infringements."

Facts

310. The following facts are not in dispute.

311. First, the UK Government has developed a Smart Energy Code (SEC), which is in essence, a multiparty agreement setting out the contractual relationship between the DCC and its users. The DCC and energy suppliers are required to become parties to the SEC and to comply with its provisions. BG admits that it is an energy supplier and a party to the SEC.

312. Second, as a supplier party to the SEC, BG is required to ensure that all devices forming part of its smart metering system are interoperable with the DCC, and it is required to carry out testing together with the DCC to satisfy those obligations. Again, this is admitted.

313. Third, it is admitted that the Future System (as defined) is a smart metering system within the meaning of the SEC, and that the devices British Gas intends to install (i.e. utility meters and communications hubs) fall within the requirements of the SEC.

314. Fourth, British Gas has thereby entered into an agreement with the DCC and with all other parties to the SEC which aims to ensure that the materials British Gas intends to supply and use as part of the Future System will inter-operate with all other parts of the Future System in such a way so as to deliver a SMETS2-compliant system.

315. Fifth, British Gas has confirmed it intends to comply with its legal obligations and there is no serious dispute that it is engaged in proposed roll out of such systems.

316. One oddity about the case is that BG did not serve any evidence directed to this issue and the basis for BG contending that it would not be acting pursuant to a common design with DCC was not very clear. In my judgment, on the basis of the facts as pleaded and admitted, BG would be acting pursuant to a common design with the DCC to implement a system and method falling within claims 1 and 11 of the Patent (as proposed to be amended). This seems to be a paradigm case for such liability to arise, since the undertakings in question are proposing to engage in activities which are together required technically to implement the system. This is a case in which BG and DCC would therefore have combined to secure the doing of acts which, were they to be done would be infringements.

Conclusion on infringement

317. For the above reasons, I find that the BG systems would infringe the Patent if it was valid, the issue to which I now turn.

VALIDITY

Inventive step/obviousness

318. I shall deal first with the inventive step case on the assumption that the Patent has the narrower construction.

Law

319. The relevant law is not in dispute and the approach to evaluation of obviousness, has been set out in substantially the following terms in numerous cases. Since it is so well known, I shall simply summarise the key propositions of law particularly relevant to this case.

320. First, a patent is invalid for lack of inventive step if the invention claimed in it was obvious to a person skilled in the art having regard to the state of the art at the priority date (Patents Act, s.3).

321. It is important to bear in mind that no re-formulation is a substitute for that statutory test. As Jacob LJ said in *Generics v. Daiichi* [2009] RPC 23 at [17],

> "There is at bottom only one test, namely that posed by Art 56. of the EPC transposed into UK law by s.3 of the Patents Act 1977. Was the invention obvious to a person skilled in the art having regard to any matter which forms part of the state of the art? Judicial or patent office attempts to formulate the test in other words or to provide a formula, can be helpful, provided that one does not lose sight of the statutory question."

322. Second, the familiar structured approach to the assessment of allegations of obviousness articulated by the Court of Appeal in *Windsurfing International Inc v Tabur Marine (Great Britain) Ltd* [1985] RPC 59 and re-stated by Jacob LJ in *Pozzoli v BDMO SA* [2007] EWCA Civ 588, [2007] FSR 37 at [23] is as follows and can assist in some cases:

> "(1) (a) Identify the notional 'person skilled in the art';
> (b) Identify the relevant common general knowledge of that person;
> (2) Identify the inventive concept of the claim in question or if that cannot readily be done, construe it;
> (3) Identify what, if any, differences exist between the matter cited as forming part of the 'state of the art' and the inventive concept of the claim or the claim as construed;
> (4) Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of invention?"

323. Third, in *H. Lundbeck A/S v Generics (UK) Ltd* [2008] EWCA Civ 311, [2008] RPC 19 at [24] and *Conor Medsystems Inc v Angiotech Pharmaceuticals Inc* [2008] UKHL 49, [2008] RPC 28 at [42] Lord Hoffmann approved without qualification the following statement of principle by Kitchin J at first instance in the former case:

> "The question of obviousness must be considered on the facts of each case. The court must consider the weight to be attached to any particular factor in the light of all the relevant circumstances. These may include such matters as the motive to find a solution to the problem the patent addresses, the number and extent of the possible avenues of research, the effort involved in pursuing them and the expectation of success."

324. Fourth, on occasion it can be relevant to take into account the "mind-set" in the industry. In *Glenmark Generics v The Wellcome Foundation Limited* [2013] EWHC 148 (Pat) Arnold J said:

"What matters is whether or not the invention was technically obvious, not whether it was commercially obvious: see *Hallen Co v Brabantia (UK) Ltd* [1991] RPC 195 at 213 (Slade LJ). This does not necessarily mean that commercial considerations are irrelevant. The mindset of the skilled person may be conditioned by commercial considerations only to consider certain types of technical solution, as in *Dyson Appliances Ltd v Hoover Ltd* [2002] RPC 22."

325. The issue of mindset, in so far as it enters the picture, is one aspect of an overall evaluation of whether there was or was not a motivation or reason for the skilled person to take a given step. Motivation can of course be important in evaluations of obviousness (see for example *Hoechst Celanese v. BP Chemicals* [1997] F.S.R. 547 – *"necessary to demonstrate that there is some reason for taking [the step from the prior art]"* and *Lundbeck* above). However, again here, it is dangerous to make too much of it as an isolated factor, because a product can be obvious even if there was no reason actually to make it at the priority date and a skilled person would believe it to be unusable (a 100cm dinner plate, to adapt a familiar example). It is also important to bear in mind that motivation can lie in the wish to make a different product which operates in a similar way, not necessarily a better one.

326. Fifth, the Court of Appeal said recently in *Hospira UK Ltd v Genentech Inc* [2016] EWCA Civ 780 (27 July 2016):

15. It is also often debated whether the correct question is whether the skilled person *would*, or whether he or she *could*, arrive at the claimed invention without inventive effort. A "would" test can be misleading, as it is liable to bring in irrelevant considerations, such as whether it would be worthwhile commercialising an otherwise technically obvious product, see per Oliver LJ in *Windsurfing International Inc v Tabur Marine (Great Britain) Ltd*. [1985] RPC 59 at 72. In *Actavis UK Ltd v Novartis AG* [2010] EWCA Civ 82; [2010] FSR 18, reliance was placed in argument on the EPO Guidelines for Examination which stress that the question is:

> "… whether there is any teaching in the prior art as a whole that *would* (not simply could, but would) have prompted the skilled person … to modify or adapt the closest prior art … thereby arriving at something falling within the terms of the claims, and thus achieving what the invention achieves".

16. At [46] Jacob LJ (with whom Lloyd and Stanley Burnton LJJ agreed) rejected the suggestion that this passage went as far as to suggest that it had to be shown that the skilled person would go ahead and implement the idea commercially. I would however not accept (and I do not think that the court in *Actavis v Novartis* was accepting) that it must be established in every case that the skilled person would necessarily have arrived at the precise combination claimed. That would be to place another straitjacket on the law of obviousness. The skilled person may be faced with a range of obvious possibilities, making it statistically unlikely that he will settle on any one of them. They will all be obvious: see for example the well known discussion in *Brugger v MedicAid*

[1996] RPC 635 at 661 lines 6-21, per Laddie J. In *Hallen Co. v Brabantia (UK) Ltd.* [1991] RPC 195 this court rejected a suggestion that a "would" test was always to be preferred. At page 212, Slade LJ, giving the judgment of the court, said:

> "We accept that the "*could*" test is a minimum condition that must be satisfied on the facts before obviousness can be established in any given case. With this qualification, we agree with the judge's comment … that the proper question depends on the facts of each case, though always bearing in mind that, under section 3 of the 1977 Act, the onus ultimately falls on the defendants to show that the alleged invention was obvious to a person skilled in the art, having regard to any matter which formed part of the state-of-the-art at the priority date.""

This passage emphasises that more than one route may be obvious. It also highlights the importance of the court not becoming side-tracked when it makes the multifactorial evaluation of whether an invention was technically obvious by the question of whether, for commercial or regulatory reasons, it would have appeared desirable actually to make or try to sell a product of the kind described in a patent.

327. Sixth, an invention may lie in an idea. In *Olin Mathieson v Biorex* [1970] RPC 157 Graham J said:

> "… the invention may lie in the idea of taking the step in question. Why should anyone want to take this step unless he had first appreciated that such a step might give him a useful product?… and it is in my judgment not obvious to take the step in question unless and until it has been conceived that the idea of doing so might lead to a useful result. Of course, once one has the idea of doing so it is perfectly obvious how to do it but that is not the material question." [at 192]

328. Again here, it is important not to apply this thinking in an unthinking way. It is, as noted above, perfectly possible for useless things or things which are clearly worse than the prior art, technically or commercially to be obvious. Equally, things which everyone might have thought to be useful may be wholly unobvious.

329. Seventh, in undertaking the evaluation, it is important in an obviousness evaluation to avoid hindsight in any respect. It is unfair to the patentee to say that something is obvious because it appears so in hindsight. Equally, it is unfair on third parties to say that something is not obvious because of hindsight-based reasoning for why a skilled person would not have followed a route that was readily to hand. There are many instances of attempts to argue both the former and the latter in the case law and the court must guard against each.

330. Eighth, in determining whether an alleged invention would have been obvious the court must assume that the skilled person has a degree of common sense – indeed it is

impossible to conceive of a person skilled in any art without such an assumption. This is implicit throughout the English case law on obviousness but has perhaps been best made explicit by the US Supreme Court in *KSR International Co. v. Teleflex Inc. et al*, 550US 398. In a judgment, delivered by Kennedy J for a unanimous court, it said:

> "When there is a design need or market pressure to solve a problem and there are a finite number of identified predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.
>
> …
>
> A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning...Rigid preventative rules that deny factfinders recourse to common sense, however, are neither necessary under our case law nor consistent with it."

331. The Supreme Court referred to *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co* 464 F.3d 1356,1367 (2006) and noted that the test applied by the more recent decisions of the US federal appellate courts "not only permits but requires consideration of common knowledge and common sense".

332. That authority is neither binding nor formally persuasive because the statutory regime is different in the US nor was it cited in this case. However, in *Nichia v. Argos* [2007] EWCA Civ 741, the Court of Appeal, while divided over the outcome of that case, referred to *KSR* with approval, indicating that the approach they adopted was "similar to *Windsurfing*" (per Jacob LJ at [23]). Common sense is sometimes expressly referred to in evaluations of obviousness in actual cases (see for example in *Novo Nordisk A/S v. DSM NV* [2000] EWHC Patents 34 per Neuberger J ("If one has a mixture of substances, from which one wishes to isolate a particular protein, then it was general common knowledge (and indeed common sense) that a combination of different purification techniques would normally be appropriate.").

333. Proceeding in that way ensures that patents are not granted for the application of common sense to technical problems, even though the prior art does not specifically say that a particular technique should be used and it is not possible to point to specific direction to do so from the subject-matter-specific common general knowledge.

The varieties of invention and non-invention

334. I have referred to these considerations at length because the points and much of the case law cited above were referred to in argument. The difficulty with placing too much weight on formulations of the approach in the cases is that, just as real inventions may be made in many different ways, so alleged inventions may be obvious in many different ways.

Formulations of the applicable principles tend therefore to be done to suit particular facts and the Court of Appeal in *Hospira* issued a reminder of the risks of drawing analogies with other cases on different facts. The appellate courts have been reluctant to reformulate the statutory test and have preferred to direct the courts to make an overall, multifactorial evaluation, which is specific to the particular art and the facts of the given case, albeit bearing the matters set out above in mind. The importance of doing so was re-emphasised in the *Hospira* case and it is the approach I have adopted here.

The inventive concept and that which is inventive

335. Finally, the inventive concept of the claim, which involves all of its elements, and that which is said to be inventive about the claim are, of course, not the same. However, in a case such as the present, there is, subject to the issue of construction discussed above, agreement between the parties both as to what the inventive concept of claims 1 and 11 is and as to how that inventive concept differs from the state of the art. There is also agreement as to what is said to be inventive about the approach taken by the Patent even though there is disagreement about whether it is inventive. This is therefore a case in which it is possible to perform the statutory analysis and apply the *Pozzoli* test by focussing on that which is said to differentiate the invention of the Patent from that which is agreed to be the state of the art. The central question then becomes whether that difference would have required any degree of invention. Addressing that key issue first is therefore a way to ensure that the structured approach of *Pozzoli* and the more multi-factorial guidance in *Lundbeck* is followed. However, in dealing with this issue, I have borne in mind the point made by Meter-Tech that, on occasion, undertaking a *Pozzoli* analysis may be unfair to the patentee and may be less suited to certain kinds of case where invention is said to lie in appreciating that there was a problem, even if none lies actually solving it.

The arguments of the parties on the central issue

BG's arguments

336. BG contends that it would be entirely natural to use an identifier unique to the meter to be addressed in a system designed to provide credit to specific meters. BG contends, with the support of Mr James, that a number of options would have been obvious including using the account number, the MSN and the MPxN or some other identifier specifically introduced for that purpose. Mr James was of the view that, if anything, the MSN would have been a particularly natural choice since it identified specific meters uniquely (see below in his evidence concerning Manson).

337. Mr James' evidence did not suggest that use of the account number was not another alternative obvious choice in such a system. His evidence was that it was not the <u>only</u> obvious thing to use for this purpose and that an identifier unique to the meter was both obvious and was readily to hand at the filing date. He also drew attention to the fact that

many customers in South Africa already had their pre-payment meter credit updated by reference to identifiers unique to the meter (namely meter serial numbers) and that this provided support for his view that this was a natural thing to do, whether or not that South African practice would have been known to the skilled team at the filing date.

Meter-Tech's arguments

338. Meter-Tech accepts – indeed asserts - that it would have been obvious to use the account number as a reference to credit the meter at the priority date and, in effect, contended that this was the only obvious identifier to use. In particular, Meter-Tech argued that use of a meter reference number specifically identifying the meter, for example, would have been antithetical to the supplier's system and practice at the priority date.

339. Meter-Tech's argument was summarised in its main skeleton argument at paras. 18-21 (emphasis added):

> "…Claim 1 is addressed in particular to the way in which a new credit is delivered to the meter. In the methods discussed above, this was achieved by insertion of coins, codes, cards or keys at the meter. Here it is being done through a digital cellular network. That much is trite.
>
> ….
>
> The conventional and obvious way for a Supplier to update that approach to take advantage of the new availability of low-cost wireless infrastructure was to use the Supplier's own internal customer reference number – the account number – as the basis for retrieving the communication address for the customer's meter, in the language of the claim, the transceiver number. The Patent takes a very different approach. It is, we submit, an approach that would be antithetical to the Supplier's custom and practice, which would be to protect the system and keep control over all the information flows involved, and of all payments. <u>That is to specify that the transceiver number by retrieved by reference to a neutral reference number associated not with the customer but with the meter itself. That is the unique identifier of integer E.</u>"

340. That argument was, essentially, supported by Mr Pollock, whose main points on this were summarised at para. 188 of his first report as follows:

> "It was not known that a meter could have an associated location identifier unique to the location as integer 1E requires. The account number was associated with the customer. I do not believe the MPAN was commonly known, but even if it was, it was not an identifier of the meter. 40,000 new MSNs were being rolled out each week, and suppliers did not have accurate MSN data, so these could not properly be called 'identifiers'.

> …The idea of making a payment by reference to anything other than the account number was not known. In integer 1I, the payment includes the unique identifier. As I have explained above, the industry would not have used MSN as an identifier for the purposes of payments, as the data was too unreliable and changeable."

Discussion

341. I much prefer the arguments of BG and the evidence of Mr James to the arguments of Meter-Tech and the evidence of Mr Pollock on this issue.

342. First, in evaluating the rival arguments, it is necessary to bear in mind the purpose of such systems, namely to provide credit to the meters themselves. Just as in the old systems, where a customer fed his or her meter with coins, in systems of this kind in which crediting is done remotely and by telephone, the customer is notionally "feeding" a specific meter with electronic credit. It is then the meter which determines whether the electricity is supplied to the premises or the supply broken where there has been insufficient pre-payment. However, the key step in the process is working out which meter to feed and getting the notional coins (in modern systems credit) "into" that meter. One of the most natural things to do is therefore to use an identifier which specifically identifies the meter in question since that is the destination for the credit.

343. It was, in my judgment, natural at the filing date to use identifiers associated with the meters in such a context. Moreover, examples of such identifiers were readily to hand in the MSN. This is not a situation in which the very idea of identifying the meters themselves was original.

344. Second, I do not accept that this would have been thought by the skilled person to be antithetical to suppliers' practice to use such an identifier. Moreover, there is nothing in the claims which requires that the identity numbers of the meters must be provided to third parties. The claims cover systems in which the suppliers may keep complete control of all information for addressing meters by simply not releasing the relevant information to third parties.

345. Third, since it is accepted, indeed asserted by Meter-Tech, that it would have been obvious to use a number which is said to be obviously less satisfactory for specifically identifying a meter to which payment was credited (namely the account number, precisely because it was not unique and had data protection and security issues associated with it), it is difficult to see that use of a different number which did not suffer from those disadvantages would not also have been obvious. This seems to follow from the application of common general knowledge and common sense. Put another way, there was a clear motivation at the filing date to use such a unique identifier.

346. Fourth, meter serial numbers or something similar would have, almost literally, been in front of the skilled team at the priority date appearing, as they did, on numerous electricity bills and were in any event known to identify meters uniquely.

347. It is difficult to understand how a skilled team, with the characteristics that the experts agreed such a team would possess, could require invention to use either such a number which already uniquely identified the meters (or another unique number allocated for that purpose which has the same function). It should also be remembered that the skilled person is assumed to be of some reasonable ability. It is common ground that he or she will have been able to cope with degree-level electrical engineering. In my judgment, it is not credible that such a notional skilled person would be unable to come up for themselves with the idea of using a unique identifier of a meter where it was necessary or desirable uniquely to identify the meter for the purpose of providing credit to it, particularly when such unique identifiers were provided on every meter and shown on numerous bills. As noted above, the law requires the court to consider the person skilled in the art to be devoid of inventive ability. It does not require its notional addressee to be devoid of common sense.

348. Moreover, it should be remembered that there was not a large choice in existing types of identifiers. The case focussed on only three as noted above. This is not a case in which a skilled person would have to cast around widely for an appropriate kind of identifier to use.

Mr Pollock's reasoning

349. I have the following observations on Mr Pollock's reasoning to the contrary.

350. First, each meter actually had a meter serial number. To assert that it was "not known" that a meter could have an associated location identifier unique to the location is therefore not correct at that level of generality. It was well known that every meter had a unique identifier identifying that meter specifically.

351. Second, the fact that the suppliers may not have had complete records of the meter serial numbers does not make it inventive to make use of such numbers to identify the meters. All that would have been required to implement such a system was to find out the number in question for the meters of which records were inadequate – or indeed allocate numbers to new meters. It is again wrong to say that a meter serial number cannot properly be called an identifier because suppliers may not have complete records of them.

352. Third, meter serial numbers often appeared on customers' bills and were, to that extent, already in use by suppliers.

353. Fourth, as noted above, billing was actually done by reference to meter serial numbers for millions of customers in an important country, South Africa. The suggestion that the

idea of making a payment by reference to anything other than the account number was not known would come as a surprise to many people who made payments in exactly that way.

354. Fifth, even if suppliers may have wanted to protect the system and keep control over all the information flows involved and of all payments, it does not follow that it would not have been technically obvious, even to such a supplier, to use an identifier unique to the meter for the purpose of identifying payment. It is quite a different matter as to whether the supplier gives access to a third party to such numbers to enable them to access the meter as well. Moreover, as was common ground, in the 1990s, there was a move towards deregulation and loosening of the grip of the suppliers over the meter. So, far from being antithetical to prevailing commercial thinking, even if relevant, the approach taken by the Patent might be seen as in line with it.

355. Sixth, it was at the filing date, common general knowledge that premises might have more than one meter (for example one for gas and one for electricity). In order to implement a design of this kind in the context in which there was not a one to one relationship between the transceiver address and the meters, it would be necessary to use an identifier specific to the meter, rather than just specific to the transceiver address. There was therefore an additional motivation for the skilled team to use the number of the meter and access that via a database correlating the transceiver address with the meter. This is merely the electronic correlate of physically accessing a specific meter. If a customer has two meters at a given premises, and only one of them needs to be accessed for any purpose, it would have been obvious to use the identifier of the meter itself and provide an appropriate correlation with the address at which it is to be found. Thus, using an electronic identifier specific to the meter is merely the electronic analogue of what would be done in the physical world. Since the purpose of such systems is to identify and credit the meters and the transceivers are merely the means by which this is done, it is if anything more natural to use for identifying the meters a number unique to them than to use just the transceiver address.

356. Seventh, it is wrong in principle to consider matters solely from the perspective of suppliers. The Patent describes a meter or metering systems. The person skilled in the art is not assumed only to work at or for a supplier. Prima facie, the more natural location for such a person would be in an undertaking designing meters or metering systems which would not necessarily have shared the views suggested particularly at a time when the industry was being deregulated.

357. Although Mr Pollock said that those in the industry wishing to make changes to the design of a meter would need to work closely with the meter manufacturer to do so and that if a utility supplier wished to create a new meter, it would specify the requirements of that meter to the manufacturing industry at a high level, there is no basis for supposing that the notional skilled person would (or would only) proceed in this way. The Patent is directed to those who wish to make metering systems. Such undertakings may also be

wanting to make meters in the UK for markets other than the UK. While it may be true that a supplier would set out the specification in some circumstances, it would not be right to proceed on the basis that this was the only way in which developments in metering took place or that such a narrow perspective would be appropriate for the notional assessment.

358. Ultimately, however, I do not think anything turns on that point since, even viewed from the narrowest perspective, the claims are obvious and the conclusion does not depend on the precise manner in which the notional skilled team is said to work.

359. The Patents Act 1977 requires the court to consider whether the invention was obvious having regard to the state of the art. The general reasoning above and Mr James' evidence is applicable to implementation of each of the items of prior art considered below and does not depend on the precise disclosures of each which is why I have considered this overriding point first. Although the above analysis provides a convenient way of addressing the statutory question in the light of the agreement about what constituted the state of the art and how claims 1 and 11 (as granted and as proposed to be amended) are said to differ from it, it is nonetheless appropriate to consider the case by reference to the specific prior art cited and the attack based on common general knowledge alone to which I now turn. However, the basic analysis above is applicable to each of the items of prior art because in each case they either disclose or render obvious the basic architecture of a system of remote crediting of PAYG meters which explicitly or implicitly require identification in some way.

PRIOR ART

O'Brien

360. O'Brien is a paper given at the Sixth International Conference on Metering Apparatus and Tariffs for Electricity Supply in April 1990 organised by the Power Division of the Institution of Electrical Engineers. It is entitled "Remote Credit Management – An Alternative to Prepayment Meters". It is convenient to begin with this document, since it describes in some detail a remote crediting pre-payment system.

361. The paper begins by summarising the history of pre-payment meters and then discusses two alternatives to the coin-top up systems. First, it discusses the use of pre-payment cards. Second, it says that the

> "future is seen to lie in the establishment of a reliable and cheap two-way communication system between the customers' meters and the Company's computer systems thereby allowing remote meter reading and crediting…".

The paper refers to the fact that trials of such systems have focussed more on remote meter reading and notes that Northern Electric wished to pursue crediting as a prime objective. The paper therefore discusses and focusses on a trial system of Credit

Management Units (CMUs) which included a pre-payment option with supply interruption and restoration on demand.

362. The key disclosure for the purpose of this case is in the sections entitled "Overall System Operation and Equipment in Use". These describe a management system computer containing a full database of all customers involved in the trial and a second microcomputer at the Company's Central Meter Testing Station. This unit is used to initialise the CMUs on installation among other functions. The central control system and its contents are explained in greater detail in the sub-section on Management System Control which states that the data base "holds customer reference, address, meter and dialling details".

363. This is an important disclosure because it highlights the fact that the database is a comprehensive one. It is therefore common ground that the management system microcomputer would be expected to contain details of account numbers, meter serial numbers, MPxN numbers, if they had them. As Mr Pollock said, it would be expected to contain "Everything they could put in". Although Mr Pollock also said, in cross-examination, that the reference to "meter...details" would more likely be the meter type designation, he accepted that the reference to these could include the MSN. In my judgment, there is no reason to suppose that a skilled person reading this document and contemplating how to implement such a database would exclude from it the identifying numeral of the meter if the skilled team was already contemplating inclusion of more complex details about the type of the meter.

364. It is common ground that the reference to "dialling details" would be the transceiver number (see T3/327). Thus in that context "details" would be read as a number. There is no basis for reading the reference to "meter" details as excluding a reference to the number identifying the meter, which would most likely be the MSN.

365. Thus, this article describes a CMU which includes a database which includes the MSN. However, even if the article does not describe it implicitly, in my judgment, taking the evidence as a whole and, particularly the evidence that it would be natural to want to include "everything", it would be obvious if implementing such a system at the filing date of the Patent to include the meter serial number in such a database.

366. It therefore follows that with this paper, which was notionally before the skilled person at the filing date was a design of system which included a comprehensive data-base including (among other things) account details for the customer, the transceiver number, and the uniquely identifying number of the meter in question. That database therefore includes at least one identifier which Meter-Tech accepts would fall within the scope of claims 1 and 11, even narrowly construed.

367. Second, it is common ground that at the filing date, it would have been obvious to use a digital cellular transceiver for O'Brien (see T3/329).

368. Third, although Mr Pollock maintained in his cross-examination that O'Brien would not render the claims obvious, for the reasons given above, I prefer the evidence of Mr James on this issue. Mr James said in his written evidence (see first report, para. 362) that the MSN could be used in a modified system based on O'Brien to identify the meter, rather than the account number, although he pointed to potential disadvantages in doing so in that the supplier's database might not be particularly well suited to accessing customer records via the meter number. I am not persuaded that this means that it would not have been technically obvious to use the MSN at the filing date.

369. Meter-Tech submits that in cross-examination Mr James "made no suggestion that the MSN would be obvious". I do not think that is a fair reflection of Mr James' evidence, taken as a whole. In his written evidence, he said that the MSN could have been used to identify the meter. He was then asked in cross-examination whether the account number was the most obvious and straightforward identifier to use in O'Brien . He agreed that it was but also said again that the meter serial number could be used as an alternative (see T4/465). It was not in fact squarely put to him that the use of the MSN in that way would not have been an obvious alternative at the filing date in an O'Brien system and it is therefore not surprising that he did not directly engage with that question in cross examination. I am therefore not persuaded that Mr James' view that use of the MSN was an obvious alternative was undermined in cross-examination.

370. Nor am I persuaded by the argument that Mr James' evidence was limited to saying merely that the MSN "could" be used in the sense of the could/would distinction sometimes drawn in the case law nor is that approach in any event a straight-jacket (see above). The sense of his evidence was, to my mnd, clear namely that the use of the MSN as an identifier would have been a technically obvious option. His evidence, taken as a whole, was to say that it was obvious that the MSN could be used, albeit that whether it would have been used depended on the way in which the system was set up.

371. In my judgment, claims 1 and 11 are obvious over O'Brien taken with the common general knowledge

Manson – WO 99/31953

372. Manson is a patent application, published on 1 July 1999, by a number of companies engaged in electricity supply in New Zealand. It discloses a system for transferring financial data from a utility supplier to a number of remote devices belonging to consumers. Each device is arranged to receive the message transmitted by the controller over the radio network and to store in the device memory the financial data where the network address of the message matches the network address of the receiver. These devices may be provided with metering functions. One purpose of the design disclosed is the remote crediting of pre-payment meters.

373. Each device is provided with a network address called a receiver identification code in a paging network. The controller directs financial data intended for that particular device using that receiver identification code. In one aspect of the design, each device is allocated an individual device identification code. Manson states:

> "The preferred codes are selected so that each device needing to be addressed individually has an individual device identification code which differs from the codes of other devices having the same network address" (p5)

374. Various data (including credit or tariff data) can be transmitted to individual devices (or by providing groups of devices with a common receiver identification code, multiple devices at the same time).

375. It is common ground that Manson discloses, and it would in any event have been obvious to use, such a system for crediting a pre-payment meter. Equally, there is no dispute that used in that way it would be necessary to identify the destination of a payment to be made. The only dispute is whether, at the priority date, the skilled person would consider that the means of identifying such a payment would be confined to the customer account number or whether it would (additionally or alternatively) be obvious to use another identifier unique to the meter itself, such as the MSN. The issue of obviousness over Manson therefore collapses to the point discussed above.

Mr James' evidence

376. Mr James considered that the claims are obvious over the disclosure in Manson. His reasoning on the essential feature is as follows:

> "303. Page 3, line 22 to page 4 line 6 describes the process by which the user makes a payment and this is sent to the controller. Data representative of this payment must be identified as intended for a particular device. Exactly how it is identified is not specified but it must take place somehow. But the skilled addressee must infer, because the financial data is intended for a particular device, that it has with it some uniquely identifying attribute for that particular device when sent to controller 8. If it did not there would be no way of working out what meter was to be credited.
>
> 304. We are told (page 4, lines 20-22) that the controller 8 attaches the network address of a device to the financial data intended for that device. The controller 8 must therefore have determined the network address (RIC) from whatever uniquely identifying attribute was given to it":

377. When that is coupled with the evidence, which was ultimately common ground, that it was common general knowledge that a meter has a serial number unique to the meter, it seems to me self-evident that such a number (whether the meter serial number itself or

any such unique number as may be provided) would have been an obvious candidate to use for the unique identifier. Mr James said the following (first report at 319):

> "for the reasons I set out above….a payment must be identified as being intended for a particular device. As such, a unique identifier of that device must be used. It does not matter as far as the disclosure of Manson is concerned what identifier is used. The best known unique identifier of a meter as at the priority date was the meter serial number. It was also common general knowledge that in communicating solid state meters the meter serial number was normally stored in the meter."

378. In my judgment, that evidence is cogent and it was not materially undermined. Meter-Tech says that his evidence changed in cross-examination. In my judgment it did not (see T4/474-479). As with O'Brien, Mr James made the point that the use of the account number was "one way of doing it" and that device identification was important. It was not suggested to him that it would not have been obvious to use the MSN to identify the meter as an option. Indeed, it was never suggested to him that his evidence at para. 319 of his first report did not reflect the thinking of the notional skilled person at the filing date. In my judgment, it did.

Mr Pollock's evidence

379. Mr Pollock gives three main reasons in his first report for saying that the Patent is not obvious over Manson.

(1) Manson does not identify the problems of 'card not present' transactions or of third parties crediting a meter, so there is nothing to direct the skilled person to give the *meter* a unique identifier as per the Patent.

(2) Manson is really directed at a one-to-many communication method to address multiple meters simultaneously. This is a very different problem to that in the Patent, and one which the use of a unique meter ID would not solve.

(3) There would be no need to use an additional unique identifier, because Manson already provides a uniquely addressable meter through the RIC + DIDC combination.

380. None of these reasons are convincing. First, the relevant claims of the Patent are not limited to a situation in which a third party is crediting a meter. There was, as I have explained, a clear motivation to use an identifier which was unique to the meter in crediting the meter quite independently of by whom such credit was being done. Second, it is not correct that Manson is "really" directed at one-to-many communications. To the contrary, it specifically discloses a system which is intended to address single meters by giving them a unique identifier and using that to address messages to that meter alone. As Mr Pollock says elsewhere in his first report: the combination of RIC + DIDC is a unique address disclosed by Manson. Third, if anything it points in the opposite direction in that it indicates that, like the Patent, addressing a meter uniquely involves the use of

two elements one unique to the "telephonic" location (the RIC) and one unique to the meter (the DIDC).

381. For these reasons, I prefer the evidence and reasoning of Mr James to Mr Pollock with respect to the case of obviousness of these claims over Manson. The contrary argument seems to me to proceed on the basis that, despite the fact that numbers uniquely identifying meters were in fact in widespread use and that a number uniquely identifying a meter was needed to implement Manson, it would nonetheless require invention to use such a unique number for that purpose. That is, in my judgment, unrealistic.

382. Claims 1 and 11 are obvious over Manson taken with the common general knowledge.

NETP Article/Paknet Connections

383. This is an article (more in the nature of a marketing document) from 1991 which describes in general, not particularly technical, terms a trial system by Northern Electric for payment and remote monitoring. Broadly speaking, it is presenting the advantages of using Paknet in payment systems.

384. The article describes a system for domestic customers in the following terms:

> "The domestic pre-payment trial involves a card system which can help eliminate bad debt and fraud. "All customers helping us with the evaluation are issued with an identity card, similar to a credit card, that holds all their accounts details" explains Stuart Tweedy, First Engineer for Northern Electric. "To pay for their account, customers simply go to post offices or banks, who accept payment and use the card to update the account, via Paknet. The credit is transferred back to the user's meter, again via Paknet, usually even before the customer leaves the points of sale"".

385. The parties' arguments concerning obviousness were essentially the same as those for Manson.

386. BG contends that an obvious identifier to use for the purpose of crediting the meters was an identifier unique to the meter itself which could be the meter serial number or some other unique identifier. Meter-Tech contends that the skilled person would not have thought of using any other identifier than the account number and draws attention to the specific mention of payment to a customer account.

387. As before, there is no dispute that, by the filing date, it would have been obvious to implement a system of the kind described in this article using a digital cellular communication system and, indeed, it is not in dispute that Paknet was such a system, operated by Vodafone in the 1990s. Other than the question of what identifier to use, by the end of the trial, there was no dispute that all of the integers of claims 1 and 11 were

either disclosed in the NETP article or would have been obvious or inevitable should such a system be implemented.

Mr James' evidence

388. Mr James gave similar evidence to that with respect to the other art that the MSN could have been used and I accept it for the reasons given above. This is not a situation in which the reference in NETP to the use of the account number implicitly excludes the use of any other form of identification of the meter or actively points away from such use. In any system of this kind there will be payment to a customer account. Thus the reference to the use of the account number would not be read by the skilled person as excluding any other form of identification of the meter itself for the purpose of crediting the payment.

Mr Pollock's evidence

389. Mr Pollock's evidence concerning this prior art was similar to his evidence concerning Manson. He says that the utility meter disclosed in the NETP article does not have an associated location identifier, there is no remote database translating Paknet numbers to identifiers although he accepted that it would have been obvious to implement such a system in a way in which the account number was translated into an appropriate Paknet transceiver number. He also took the view that the system in NETP makes a payment to the meter indirectly via Northern Electric rather than directly to the meter "as required by the Patent". As to that, I have already observed that this is not required by the Patent and, to that extent, his evidence proceeded on an incorrect basis.

390. As to the heart of his evidence his view in his first report was that it would be obvious to use the account number as a reference number and there was no reason why the skilled person would think to go beyond the account number. I have already addressed above why, in my judgment, there would have been good reason for a skilled person to use an available identifier specifically identifying the meter for the purpose of specifically crediting the meter.

391. Accordingly, in my judgment, claims 1 and 11 are also obvious over the NETP Article taken with the common general knowledge.

Peddie and Claim 5

392. Claim 5 is in the following terms:

> "A pre-payment energy supply system according to claim 4, in which the user interface unit includes a card reader device, wherein the card reader device is arranged to read data from a card to be charged for the transaction, the user interface unit being responsive to process the data from the card to form at least part of a transaction authorisation".

393. Claim 4, which is dependent inter alia on claim 1, and which is not defended as independently valid adds the requirement of a "user interface unit arranged to communicate with the utility meter via RF signals". This claim and claims 1 and 11 as proposed to be amended are said to be obvious over EP 0 015 120 A1 ("Peddie") published many years before the filing date of the Patent in September 1980.

394. Peddie discloses a pre-payment energy supply system, including a meter, in which there is a remote central processor connected via a data link. This is said in Peddie to be a telephone line, radio link or other suitable form provided at the location to be supplied with energy. The meter includes a memory for the storage of data. The system disclosed permits the transfer of pre-payment credit from the utility supplier to the meter via the data link to add appropriate pre-payment credits. There is no dispute on the evidence that, in order for this to be implemented, there must be some means of identifying the meter in question.

Discussion

395. It is convenient to consider how Peddie differs from the claims of the Patent and whether those differences individually and cumulatively would have been obvious together.

396. First, it does not disclose a digital cellular transceiver. However, by the priority date, digital cellular transceivers would have been an obvious way of effecting the relevant communication. This difference is therefore supplied by application of the common general knowledge. Ultimately, Mr Pollock did not suggest otherwise.

397. Second, the Figure 2 embodiment of Peddie discloses that pre-payment credit may be purchased by inserting coins into a slot in the meter. This plainly involves the sending of some sort of signal to the central processor which tells the utility how much money has been paid. That was common ground. It is therefore implicit that this will involve identification of the meter which has been credited although Peddie does not disclose details of how that is to be achieved. Peddie is silent as to the nature of the identifier. It would, in theory, have been possible to implement Peddie by allocating in effect the modem number (in effect the telephone number) and using this single identifier to identify the meter. In such an implementation, there would be no need for an additional unique identifier for the meter itself.

398. For the reasons given above, in my judgment, one obvious means of identification to use at the priority date would have been a number unique to the meter and the arguments are similar to those for the previously considered prior art.

399. Although it would also have been obvious to use an account number to identify the meter, since the purpose of Peddie was to use a communications link to update the meter itself, using an identifier unique to the meter such as an MSN would have been obvious. This

difference is therefore also supplied by an obvious application of the common general knowledge and common sense in the manner discussed above. It is inevitable that this will involve the use of a database for storing such identifiers and associating them with the relevant transceiver number and credit to the meter. That also is common ground.

400. Third, the inventive concept of Claim 5 of the Patent differs from Peddie in that the claim requires a card reader whereas Peddie discloses a user interface with a keyboard into which a user enters data from a card to perform a transaction authorisation. The feature in Peddie is described in the following way:

> "To make a desired payment the customer would key in a security number, for example a number indicative of a particular credit card, this number would be displayed on the display 23 and may be checked before being transferred to a register in the unit 20. The customer would then key in the amount of the transfer and again check it on the indicator 23 before transferring to the register. The appropriate amount would be utilised immediately to update the credit/debit information in the register in the microprocessor 20 and would subsequently be transferred via the data link 26 to the central processor at the utility."

401. Mr James considered that it would be obvious at the filing date of the Patent to substitute a card reader for a device which required manual input of (for example) a credit card number. I find that evidence persuasive and prefer that approach to Mr Pollock's. The difference between this claim and the Patent is therefore again filled by the common general knowledge and the substitution of a piece of apparatus expressly disclosed (a numerical key pad for entering card details) by an obvious alternative (a card reader). I do not find BG's analysis of this element of the claim in terms of a mere collocation to be particularly helpful in this context. Although it is true that the card reader and the approach to identifying the meter are independent, this aspect is better analysed in terms of an obvious substitution of part of the apparatus which would have been appreciated by the skilled person to have no impact on the operation of the rest of the system disclosed in the prior art.

402. For these reasons, claims 1, 5, and 11 are obvious over Peddie taken with the common general knowledge.

Loe (UK Patent Application GB 2 313 462)

403. This prior art is only cited against the Patent as proposed to be amended and there is no statement of case in respect of it.

404. Loe is a UK Patent Application of which the proprietor is Landis & Gyr. It was published on 6 November 1997. The basic idea is to provide a metering system in which some of the characteristics of a pre-payment meter are provided by a system which includes credit meters. In essence, the metering system described measures the consumption from all of

the meters and if credit for any one of them has been exceeded is able to shut off the meter which is the prepayment meter. The description says that a pre-payment system can be implemented even if one or more of the meters does not incorporate a cut off facility provided that such a facility is provided by at least one of the meters in the system (p3). Thus, the design provides what might be called a "composite" pre-payment meter system in which, taken together, the meters at a customer's premises can be used to provide pre-payment metering for all of the services.

405. As to the pre-payment operation, the description says that this may be effected "by remote communications with the control means, eg. By PTSN-based or radio or mains signalling systems, or the metering system may include user operable input means associated with the control means for updating of the credit values." (pp4-5).

406. In my judgment, the reasoning is the same with respect to Loe as with respect to the other art. Loe does not say how the meters are to be identified. Nor does it describe a local transceiver in any detail or a remote database. To that extent, it is less explicit than some of the other art considered above. I am not persuaded that there is any teaching in Loe away from use of an identifier specific to the meter in a relevant way.

407. The debate over obviousness is however, the same. Loe assumes that a skilled person would be able to work out how to do this.

408. Mr Pollock again says that it would have been obvious to use the account number and not a number uniquely identifying the meter in implementing Loe. In my judgment, for the same reasons as given above that is too narrow an approach and at least one obvious identifier at the filing date would have been a number such as the MSN which specifically identified the meter in question. To that extent, I prefer the approach of Mr James for the same reasons. There is no dispute that implementing a design of this kind using a digital cellular network would have been obvious at the filing date.

409. Meter-Tech contends that Mr James was unable to justify in cross examination his position that the MSN would have been an obvious identifier to use in implementing Loe. While it is right to say that he accepted that Loe was silent on the use of the MSN as an identifier for this purpose, he said that the account number was "a natural identifier". He did not say that it was the only natural identifier to use and it was again not put to him that the MSN would not also be a natural identifier to use.

410. Accordingly, I reach the same conclusion on the basis of Loe as over the other cited art in relation to claims 1 and 11.

General observations on the obviousness case relating to claims 1 and 11 on the basis of the prior art

411. The underlying reason that the conclusion is the same on all these items of art is that they all disclose or render obvious a system of remote crediting using a telephone system of one kind or another of a pre-payment meter which inevitably relies on identifying the meter in various degrees of specificity. The principal art (O'Brien, Manson and NETP) have that as the or a central focus of their disclosure and to that extent form a particularly clear basis. Once it is shown that the means of telephonic communication (digital cellular and RF in the home) would have been obvious, the only remaining question is whether (it being accepted that the use of the account number to identify the meter would have been obvious), the use of the MSN would also have been obvious. None of the prior art citations contain material which specifically teaches away from the use of that approach, which was readily to hand at the filing date.

412. I would also observe that the questioning in the oral evidence did not always directly engage with the heart of the issues on either side and was in certain respects circumlocutory. In my view, in this case, that does not matter. The evidence, taken as a whole is sufficient to clothe the court with the mantle of the skilled person and enable reliable conclusions as to validity to be drawn without it being necessary for each side to have put precisely their position to the other side's expert. Equally, as explained above I am not persuaded that the differences between the statements of case and the evidence were of significance in this case. There was greater emphasis on the use of the MPxN in BG's pleadings but not to the exclusion of other identifiers.

Obviousness in the light of the common general knowledge alone

413. This is a rather unusual case in that the only matter said to differentiate the subject matter of claims 1 and 11 (even as proposed to be amended) from the state of the art is the use of an identifier unique to the meter instead of the account number. For the reasons given above, I consider that this step would not have required invention in the context of a design with the other characteristics of the claims. Nonetheless, this was not the argument actually developed in the pleaded case of obviousness over common general knowledge alone. In my judgment, because of the issues discussed above relating to the importance of pleading a case of common general knowledge, I do not think it would be appropriate to base a decision of obviousness on this additional ground in these circumstances.

414. I should say that I am not thereby holding that the key claims of the Patent were not obvious in the light of common general knowledge alone, merely that it would not be fair so to hold, given the manner in which the case was developed (and, in particular, not developed) in the pleadings. It might be thought that this approach should also apply to Loe, since no statement of case was served in respect of this and there would be something to be said for such an argument. However, in my judgment, different considerations apply where no statement of case on invalidity was ordered and the prior art in question is cited merely in the context of a response to the proposed amendment. Loe is not, in any event, a particularly key citation.

Obviousness and novelty in the light of the state of the art if the claims have a broader construction

415. There is no dispute that if claims 1 and 11 have the broader construction and do not require there to be a location identifier associated uniquely with the meter itself (such that the account number would satisfy this integer) these claims are invalid, since it is accepted that it would have been obvious to address the meter by reference to the relevant customer account number. That was suggested by Meter-Tech to be the most obvious approach to take to implementing the prior art. I am not however satisfied that the claims would lack novelty since none of the art cited clearly and unmistakably discloses all of the integers or makes it inevitable that they would be used even on the broader construction.

The claim as proposed to be amended

416. I have explained above why in my view claims 1 and 11 are obvious if construed to cover a number uniquely identifying the meter. One such number which it would have been obvious to use at the filing date was the MSN and the evidence was primarily directed to the use of such an identifier. That number would fall within the claims as proposed to be amended since (on any view of "embedded") the MSN is permanently fixed and associated with the meter itself.

Mr Orchard's draft evidence

417. As noted above, Meter-Tech served by way of disclosure a copy of draft evidence of the expert witness who was originally instructed by them and had also previously been consulted by the agents to BG. Although it put the key points of common general knowledge in somewhat different ways, the essential points about identification of meters were the same. The draft as served analysed only one item of prior art and, although I have read it, I do not think it takes the argument on either side any further.

Conclusion on obviousness

418. Regardless of which construction is adopted, claims 1 and 11 (as originally granted and as proposed to be amended) and claim 5 of the Patent were obvious to the person skilled in the art at the filing date in the light of the state of the art.

ADDED MATTER

Law

419. Section 72(1) of the Patents Act 1977 provides:

"(1) Subject to the following provisions of this Act, the court or the comptroller may on the application of any person by order revoke a patent for an invention on (but only on) any of the following grounds, that is to say—
…
(d) the matter disclosed in the specification of the patent extends beyond that disclosed in the application for the patent, as filed, …"

This section is based on Article 138(1)(c) of the European Patent Convention, which provides so far as material:

"(1) Subject to Article 139, a European patent may be revoked with effect for a Contracting State only on the grounds that:
…
(c) the subject-matter of the European patent extends beyond the content of the application as filed …;

420. The issue of added matter falls to be determined by reference to a comparison of the application for the patent as filed and the granted patent. As Aldous LJ said in *Bonzel v Intervention (No 3)* [1991] RPC 553 at 574:

"The task of the Court is threefold:
(1) To ascertain through the eyes of the skilled addressee what is disclosed, both explicitly and implicitly in the application.
(2) To do the same in respect of the patent as granted.
(3) To compare the two disclosures and decide whether any subject matter relevant to the invention has been added whether by deletion or addition. The comparison is strict in the sense that subject matter will be added unless such matter is clearly and unambiguously disclosed in the application either explicitly or implicitly."

421. The approach is not in dispute and has been summarised as follows (see the summary in e.g. *Hospira UK Ltd v Cubist Pharmaceuticals LLC* [2016] EWHC 1285 (Pat)) Arnold J:

i) The test of added matter is whether a skilled person would, upon looking at the amended specification, learn anything about the invention which he could not learn from the unamended specification; *Vector Corp v Glatt Air Techniques Limited* [2007] EWCA Civ 805; [2008] RPC 10 at [4], approving Jacob J in *Richardson-Vicks Inc's Patent* [1995] RPC 568 at 576.

ii) One reason for the rule against adding matter is that third parties should be able to look at the application and draw a conclusion as to the subject matter which is available for supporting the claimed monopoly. If subject matter is added subsequently, the patentee could obtain a different monopoly to that which the application originally justified; *AP Racing Ltd v Alcon Components Ltd* [2104] EWCA Civ 40; [2014] RPC 27 at [9]-[10].

iii) The test of whether the skilled person is confronted with new information depends on whether the combination of claimed features in the patent derives directly and unambiguously from the application, read as a whole. It is not necessary for the subject-matter of the amendment to have been explicitly disclosed in the application. Literal support is not required by Article 123(2) (T 667/08 of 20 April 2012, and the EPO Guidelines for Examination Part H, Chapter IV, §2.2).

iv) An intermediate generalisation occurs when "a feature is taken from a specific embodiment, stripped of its context and then introduced into the claim in circumstances where it would not be apparent to the skilled person that it has any general applicability to the invention"; *Nokia v IPCom* [2012] EWCA Civ 805; [2013] RPC 5 at [56].

v) The question is whether the feature in question would be seen by the skilled person as being generally applicable or only of significance in the context in which it was specifically disclosed; *Nokia v IPCom* at [59]-[60].

The role of the claims in added matter analysis

364. In *AP Racing*, the Court of Appeal drew attention to the importance of not treating a generalisation of a feature in the claims as automatically adding matter in the following terms:

30. There is no doubt that the claims of the patent form part of the disclosure for the purposes of assessing whether there is added matter. However the claims perform a different function from the disclosure in the body of the specification. The primary function of the claims is to delimit the area of the patentee's monopoly. Thus in *Texas Iron Works Inc's Patent* [2000] RPC 207 the patentee had disclosed "slips and cones" which acted as hanger units in an oil well hanger. In the granted patent the patentee coined the phrase "liner hanger unit" to define his monopoly, although the phrase was apt to cover units other than slips and cones. Aldous LJ (with whom Simon Brown and Mantell LJJ agreed) said this at page 245:

> "… the purpose of the claims in a patent is the identification of the ambit of the protection and disclosures are normally a matter for the specification. The application before the amendment clearly and ambiguously disclosed slips and cones which acted as hanger units. The amendment did not alter that disclosure. By using the phrase "liner hanger unit" in the claim the patentee did not disclose any other construction of liner hanger: the term was used to widen the ambit of the monopoly."

31. In *A.C. Edwards Ltd v Acme Signs & Displays Ltd* [1992] RPC 131 it was argued that three features of a claim of the granted patent were stated in more general terms than the disclosure of the specific embodiment. Thus, for example, the application disclosed

the use of a coil spring and cotter arrangement as a retaining means, but the relevant added feature simply specified a "spring means". Fox LJ (with whom Staughton LJ and Sir Michael Kerr agreed) concluded that this did not add matter. Fox LJ said:

> "… claims, as a source of disclosure, have no greater force than the other admissible documents… Mr Whittle is, I think, correct when he says that the claim *covers* those matters because the patentee chose to limit its claim by reference to features other than the three in question. In practical terms I do not think there is anything very surprising about that result since the purpose of the claims is the identification of the ambit of protection. Disclosures are normally a matter for the specification. One looks, no doubt, at the whole of the issued patent specification in determining what it discloses, but even so, I find no disclosure in claim 1."

32. In Decision T 065/03 *Toyota Jidosha KK* the Technical Board of Appeal of the European Patent Office concluded that the replacement of the term "diesel engine" by the term "combustion engine" in a claim to a method of purifying exhaust gas constituted added matter. The Board concluded that the disclosure of the granted patent would be understood to mean that the method of the invention was suitable for any type of engine, not merely diesel engines, and that such a teaching could not be derived from the application as filed.

33. It is clear from these decisions that the law does not prohibit the addition of claim features which state in more general terms that which is described in the specification. What the law prohibits is the disclosure of new information about the invention. In the *Toyota*case there was such a disclosure of new information, namely the new information that the invention was suitable for engines other than diesel engines. However in *Texas Iron Works* and *A.C. Edwards* the specification and claims when read together did not disclose any new technical information, despite the generalisation involved in the added claim feature."

The objections in this case

422. BG maintains several added matter objections and I apply the above-stated principles to them in turn.

Card reader payment

423. First, BG contends that matter has been added because, in the application, there was nothing specifying how a signal conveying the payment for crediting the meter was made and, in so far as this is provided at all, the teaching is that the payment is effected via a card reader at some sort of facility. BG contends that Meter-Tech wants to take the feature of inputting payment data for the Patent but leave behind that some of the data must be read from a card.

424. In my judgment, this does not add matter. In the application, there was no disclosure that the input of the payment had to take place using a card reader in this aspect of the teaching of the application. Although it is true that the specification as a whole was (and remains) focused on a situation in which this information is provided by reading a card, I am not satisfied that this aspect of the disclosure depends on that specific means of doing so. The manner in which the unique meter identity is to be provided when making a remote payment is specifically described in the application as taking place via a card but I do not consider that this would be regarded as essential by the skilled addressee (cf. *Nokia v. IPCom* cited above).

425. That is reinforced by the fact that the same page of the specification refers to third parties making payments, who would not necessarily have the card that the customer carries. In this particular context, the card is only a convenient device to help the customer remember the number and help the bank, supermarket or other facility to be sure that the customer and the facility have got it right and the credit is going to be sent to the right meter by reading the number directly from the card using a card reader rather than inputting it manually.

426. In my judgment, the feature of the claim does broaden the disclosure of the specification but not impermissibly so. Crucially, the invention disclosed remains the same in each case.

Card reader only in the "card not present" invention

427. Second, BG contends that there is nothing in the application to suggest that the card reader at the customer's premises can be added for any purpose other than implementing the "card not present" invention. I do not accept the argument that this is objectionable either.

428. The application and the Patent both state that the system could be configured such that pre-payment could be made from the home via the user interface in the same manner as a regular financial transaction (see p11). Such transactions are described as using a card reader. There is therefore no intermediate generalization. The point is similar to the first one.

RF signals

429. Third, BG contends that claim 4, upon which claim 5 depends, introduces the feature of using RF signals only in the context of such communication being to obtain and transmit a transaction authorization. BG therefore contends that the disclosure of the use of RF signals between the meter and the transceiver other than for authorization purposes is not disclosed.

430. I am not satisfied that the disclosure is materially different or that the application would be read as limiting RF signals to be used only for authorisation purposes. The disclosure is a general one of the use of RF signals to communicate between meter and transceiver. Again, the invention disclosed is the same.

Database of unique identifiers and transaction numbers

431. Fourth, BG contends that the method of claim 11 was not disclosed in the parent application because the claim discloses a method which may function in the absence of a database of unique identifiers and transaction numbers. BG also contends that the claim discloses a method omitting a step performed by the remote communication unit in which that unit determines the transceiver number from the unique identifier.

432. In my judgment, this objection confuses what a claim discloses and what it covers (see *AP Racing* above). It is also not right to say that the claim discloses a method without those individual features any more than a general claim to a method of manufacture of a chemical description which omits specification of (say) the temperature at which the reaction is enabled thereby discloses that it can be performed at any temperature. If there is an objection to a generalised claim of this kind, it lies in insufficiency, in that it may be impossible to perform the invention across the whole scope of the claim without invention, if the feature in question is not included. I therefore do not accept that this added matter objection is fatal as BG contends it to be.

433. The second objection advanced in this regard seems to me to be a reformulation of the first and I do not accept that either. The claim is not teaching a different way of addressing communication. It is claiming the same way but at a somewhat higher level of generality. One may test an argument of this kind in the following way. Suppose that the claim had simply said “”A system for effecting pre-payment of electricity”. Such a claim would have faced multiple objections but added matter would not be one of them, if the specification remained the same, even though the claim disclosed none of the specific features which the description requires. In both cases, the application and the specification of the patent, taken as a whole, would disclose such a system. It is important in this context not to confuse teaching which says specifically that an invention can be performed without a particular feature with a claim which simply omits mention of that feature. It does not follow that a patent with the latter sort of claim is in fact disclosing that it is possible to perform the invention without it.

434. As can be seen from this analysis, the error comes from treating the claims not as part of the disclosure of the patent but as though they were the only disclosure in it. As soon as the disclosure and the claims or application and patent respectively are treated as a whole, as they must be, objections of this kind fall away.

The additional passage at pp1-2

435. Fifth, the next argument is focused on a specific change in the disclosure in the description. BG contends that the passage newly inserted from page 1, line 10 to page 2 line 25 adds matter.

436. The argument is somewhat intricate in that BG's primary case is in fact that this passage makes no difference to the disclosure and does not introduce a feature of direct crediting by third parties such as government agencies at all.

437. I have discussed above the attempts by Meter-Tech to read into the Patent the specific concept of making payments by bypassing the supplier which is not there. I therefore do not accept the premise of BG's argument. In my judgment neither that passage nor the passage at p11, lines 20-21 have to do with bypassing the suppliers. They are both concerned (at most) with the fact that, by the use of a number which identifies the right destination of the payment, anyone can provide credit for the meter using that number. As I have said above, the passages distinguish a situation from one in which the government or others pay the customer themselves in cash (or equivalent) rather than providing an energy credit for the meter. It is in my judgment unjustifiable to suggest that these passages make a distinction between payments that are made directly to the meter and payments which are made to the utility company for crediting to the meter. The passages do not say so and there is nothing in the specification that requires them to be interpreted in that way.

438. On that basis, I do not consider that there is any addition of matter.

The argument on the basis that this does introduce an important aspect of the invention

439. However, it would appear that this passage at pp1-2 was regarded by Mr Pollock as important to the approach he took to interpretation of the claim. If he were correct in this respect and that passage can be taken as introducing for the first time the concept of direct payment, bypassing the suppliers, as Meter-Tech alleges, there would be an addition of matter which was, on Meter-Tech's own case, not merely important to the invention but central to it.

440. I have set out above how this point affects the issue of construction, namely indirectly. It is however, central to added matter. Had I, however, accepted Meter-Tech's argument on construction, this passage would have been important to it. It would not have been possible to brush this point aside by saying that it added nothing to the disclosure elsewhere in the application as filed, particularly since at least one expert in the field treated is as having some significance. Accordingly, in my judgment, if as a result of this passage, the disclosure of the Patent could reasonably be regarded as introducing the concept of bypassing the suppliers, that passage would be material to it, there would be added matter and BG's objection would succeed.

441. This, it should be said, would be fatal to the validity of the patent. On Meter-Tech's case, the heart of the invention lies in permitting independence from the supplier and enabling third party payments to be made while bypassing the supplier. However, of all of the features in the numerous claims, this is a feature which (a) was not present in any of the claims of the application (b) was not present in any of the claims of the Patent (c) was not attempted to be amended into the Patent, even as a conditional amendment to any of the claims. Yet it is now said to be central. In my judgment, stepping back from the detail, what is really going on here, is that a specification which does not contain or disclose an allegedly critical feature at all and which is silent on an issue is now said at trial (by construing it in a given way many years after it was filed) to speak volumes on it. Patentees in such a position may actually be reluctant to make such allegedly crucial matter explicit by making a specific claim to such a feature, because the absence of the feature in the application would thereby be highlighted by that contrast. So, instead, a patentee attempts to say that, in the Patent, the concept is present, not by words, but by implication.

442. In my judgment, the court must be astute to guard against such attempts in construing claims, since they suffer from similar vices that added matter objections are designed to prevent. However, the way that the court addresses this kind of artifice is not by way of an added matter objection but by ensuring that the claims are properly and fairly construed in the first place, having regard to the description. I have done that above.

443. Finally, it is sometimes said, in the context of added matter objections, that a description should not be used as a reservoir of features from which to construct a new claim. One might equally say that, where a description is silent on an issue, it is not to be treated as a *tabula rasa* on which can be written, by implication, any concept that it may become convenient for the patentee to talk up as an aid to defending its validity or asserting its infringement many years later. That is unfair on third parties and can confer an unwarranted advantage on a patentee of the kind that the patent system is designed to avoid. That system is there to encourage the ingenuity of inventors in making and sufficiently describing real inventions and claiming them clearly. It is not there to encourage the exegetical enthusiasm of advocates in construing inventions out of their non-description, no matter how elegantly that is done.

Direct payment/direct crediting

444. Sixth, BG says that the passage in the application as filed at p11 concerns direct payment and not direct crediting. In the context of the disclosure of the invention as a whole, I do not consider there to be a difference. However, if BG is right on this, such would be a further basis upon which matter would have been added in that the alleged invention of paying a credit directly to a meter would not have been disclosed in the application while it was (as is alleged by Meter-Tech) central to the Patent. I do not consider that this is a material difference.

Embedded identifier

445. Finally, BG contends that the idea of using an "embedded" identifier is only disclosed in the context of also putting it on an identification card. I am also not persuaded that this is sufficient to add matter since there is sufficient disclosure of its use embedded in the meter.

Conclusion on added matter

446. Although the argument was also put in slightly different other ways, in my judgment, the above analysis deals sufficiently with the central points advanced.

447. The Patent is not invalid for containing added matter

OVERALL CONCLUSION

448. Claims 1, 5 and 11 of the Patent are invalid on either of the constructions advanced by Meter-Tech.

449. Amendment of the patent should be refused on the basis that the amendments would not result in a valid patent. The proposed amendments are, however, sufficiently clear.

450. All of the BG installed systems would have infringed had the Patent been valid and the defence of experimental use related to the subject matter of the invention does not apply to the historical or current installed systems. The proposed (future system) would infringe claims 1 and 11 (as granted and as proposed to be amended) if the Patent were valid.

451. Because the Patent is invalid, the Part 20 claim for revocation succeeds and the infringement claim will be dismissed.

ANNEXES

Annex 1 - Patent in Suit - Fig 5

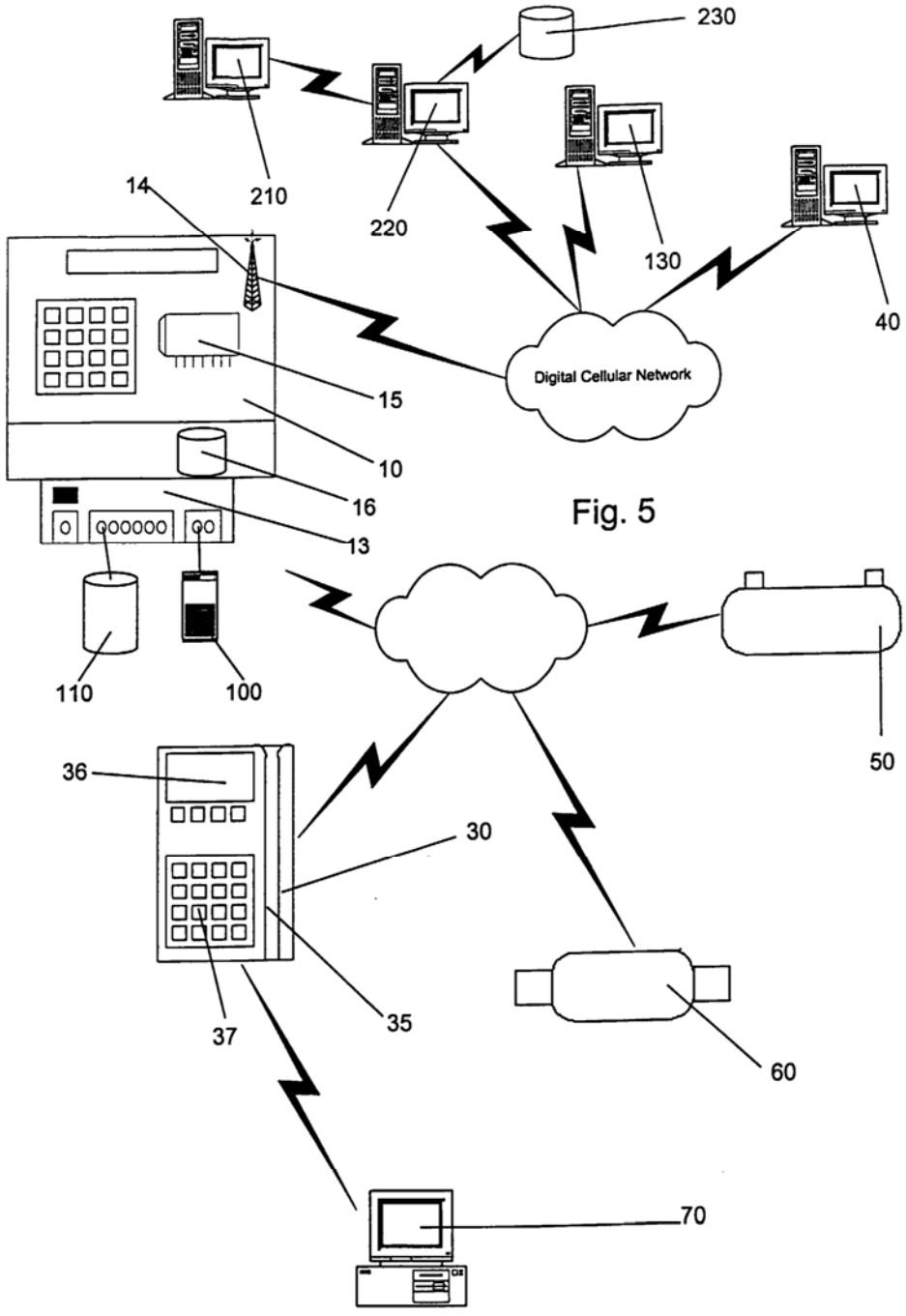
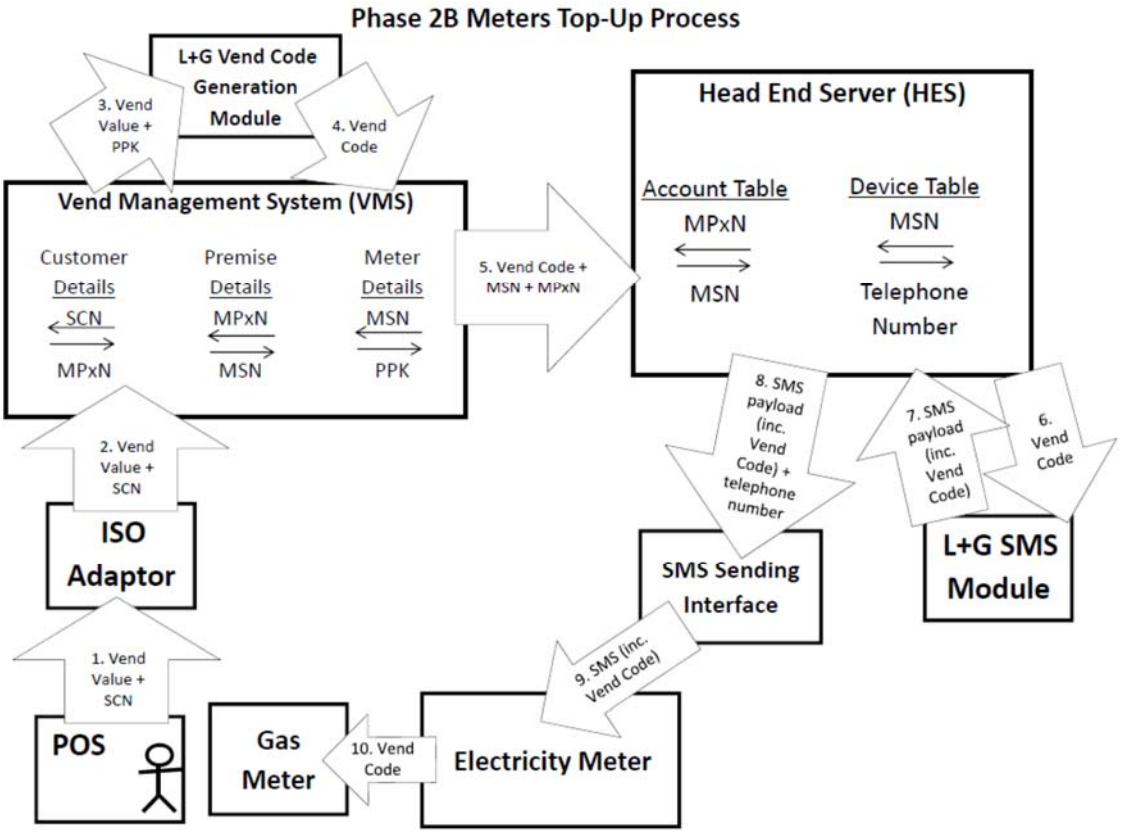

230
210
220
130
40
14
Digital Cellular Network
15
10
16
13
110
100
50
36
30
35
37
60
70

Fig. 5

Annex 2 - Diagrams illustrating alleged infringements – ALJ47, AJL48 (see Annex 3 confidential for ALJ50)

PHASE 2B METERS TOP-UP PROCESS



SMETS 2 METERS TOP-UP PROCESS