200107534-0
05 DEC 2001
E6379
33/13

METHOD FOR SUPPORTING THE ORDERS RECEIVED OF TRANSFORMER

METHOD FOR SUPPORTING THE ORDERS RECEIVED OF TRANSFORMER

BACKGROUND OF THE INVENTION

The present invention relates to methods for supporting the orders of a transformer and more particularly, to a method for supporting the orders of an amorphous transformer.

For the purpose of preventing global warming, various energy saving measures have been groped, studied and implemented in various fields.

After a transformer is installed by a power demander and a circuit breaker is once turned ON, it is few to frequently turn ON and OFF the transformer from the viewpoint of the life of the transformer itself and facilities. In the transformer, not only a load loss is generated by a load current flowing through the transformer when a load is imposed on the transformer, but a constant loss (no-load loss) is also generated constantly under a power receiving condition regardless of presence or absence of the load. Thus these losses are converted mainly to heat and become a wasteful output.

In order to reduce such losses, various improvements have been applied to the transformer. For example, there is is known an amorphous transformer in which the core of the transformer is made of an amorphous alloy and a winding structure is improved to

reduce a loss. The amorphous alloy is an amorphous solid which contains iron, boron and silicon as its raw materials and has a random structure of atoms randomly arranged. The alloy is obtained by abruptly cooling the solid from its melted state. When such an alloy is employed to the core, an energy loss (hysteresis loss) caused by magnetic flux passing through the core becomes low and the thickness of the laminates of the core can be made as thin as 0.03mm, thus reducing an eddy current loss as well. When a transformer enabling realization of such an energy saving effect is employed, this also serves as a means for reducing the amount of CO_2, which is also environmentally advantageous.

It is highly demanded that such a transformer having the energy saving effect is spread and widely popular. And when the economical effect of the power demander obtained by its loss reduction as well as the environmental effect of CO_2 reduction can be quantitatively compared with those of an existing transformer being actually used, its large spread can be expected.

Meanwhile, communication sales based on the Internet or personal computer communications is getting popular in various fields. However, the means based on the communication sales has not been employed in the transactions of the transformer, because it is desirable to select a suitable transformer depending on

customer's power demand or actual use condition, even when a transformer is newly installed (which will be also referred to as new installation, hereinafter) or when an existing transformer is replaced by a new one (which will also be referred to the renewal, hereinafter).

The reasons are estimated as follows. In the case of the transformer renewal, in particular, when an existing transformer being now used is replaced by a new one, the power demander cannot quantitatively know what degree of economical effect caused by the energy saving and what degree of CO_2 reduction when compared with the existing transformer, which leads to the fact that the demander cannot decide "transformer purchase". In order to know the above economical and environmental effects caused by the renewal, on the other hand, it is considered to install a measuring circuit to the transformer now being used, to measure the power use condition of the power demander (which will be referred to as the customer, hereinafter), and to find a quantitative numerical value. In this case, however, a series of communications of (1) customer's order "renewal", (2) installation of a measuring circuit and setting of date, place and personals required for previous inspection therefor, and (3) contact of a renewal proposal including its economical and environmental effects must be done especially promptly from the viewpoint of social demand of early

realization of energy saving and CO_2 reduction.

SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a method for supporting received orders of a transformer which, in order to widely and quickly spread the transformer having energy saving and environmental effects, can associate a sales department with a measurement department in charge of transformer measurement to quickly cope with a demand of a customer who accessed a WWW page of the sales department and to record the fact.

In accordance with an aspect of the present invention, the above object is attained by a method for supporting received orders of a transformer which includes the steps of issuing a first response including a desired inquiry of a customer relating to an installation date of a measuring circuit of the transformer from a sales department to the customer who accessed a web site of the sales department; and in response to a customer's reply to the first response, issuing a second response including the installation date of the measuring circuit of the transformer from a measurement department in charge of measurement of the transformer.

In accordance with another aspect of the present invention, there is provided a method for supporting received orders of a transformer which

includes the steps of: issuing a first response including a desired inquiry of a customer relating to an installation date of a measuring circuit of the transformer from a sales department to the customer who accessed a web site of the sales department; in response to a customer's reply to the first response, issuing a second response including an inquiry of a customer's desired date relating to the installation date of the measuring circuit and to previous inspection of the installation of the measuring circuit from a measurement department in charge of measurement of the transformer; and in response to a customer's reply to the second response, issuing a third response including an implementation date of the previous inspection from the measurement department.

In accordance with a further aspect of the present invention, there is provided a method for supporting received orders of a transformer which includes the steps of: installing a measuring circuit to a customer's transformer; receiving an amount of power of the transformer in an actual operating state in the form of electronic data from the installed measuring circuit; and returning a renewal proposal of the customer's transformer on the basis of the received data.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a network configuration of a system

by which a method for supporting received orders of a transformer in accordance with the present invention is implemented;

Fig. 2 is a diagram for explaining a communication sequence among a customer, business window, dealer, factory;

Fig. 3 shows one of WWW pages in a web site of the business window;

Fig. 4 shows other one of the WWW pages in the web site of the business window;

Fig. 5 shows other one of the WWW pages in the web site of the business window;

Fig. 6 shows other one of the WWW pages in the web site of the business window;

Fig. 7 shows other one of the WWW pages in the web site of the business window;

Fig. 8 shows other one of the WWW pages in the web site of the business window;

Fig. 9 shows other one of the WWW pages in the web site of the business window;

Fig. 10 shows exemplary one of WWW pages in a web site of a dealer;

Fig. 11 shows other one of the WWW pages in the web site of the dealer;

Fig. 12 shows other one of the WWW pages in the web site of the dealer;

Fig. 13 is an example of a response message to the dealer;

Figs. 14A to 14H show examples of pull-down menus when the customer prepares a response document;

Fig. 15 is an example of a customer's response document;

Fig. 16 is an example of a first response message of a factory;

Figs. 17A and 17B are examples of pull-down menus when the customer prepares a response document;

Fig. 18 shows an example of a customer's response document;

Fig. 19 is an example of a second response message of the factory;

Fig. 20 shows an example of a measuring circuit when connected to the network configuration;

Fig. 21 shows an example of measured data of a transformer as mean data per one of nine days;

Fig. 22 shows day load curves for four days of the transformer;

Fig. 23 is an example of a third response message of the factory including a renewal proposal; and

Fig. 24 shows a in-charge person/schedule as one in-charge person/schedule areas of various databases.

DESCRIPTION OF THE EMBODIMENTS

An embodiment of the present invention will be explained in detail by referring to the accompanying

drawings.

Explanation will first be made by referring to Fig. 1 as to a network configuration of a system by which a method for supporting received orders of a transformer in accordance with the present invention is implemented.

On the customer side, there is provided a user terminal 10 which is connected to a public network 1 of computer communication (which will be referred to as the Internet, hereinafter). Installed in the user terminal 10 is WWW client search (browsing) software (which will be referred to as the WWW browser, hereinafter) which is necessary for using the world wide web (WWW).

In Fig. 1, a business window 20 opening its web site and a dealer 30 opening its web site are shown as examples of sales departments of the transformer. Although the number of such business windows 20 and the number of such dealers 30 are "1" respectively in Fig. 1, a plurality of such windows or dealers may be provided for each of business areas predeterminedly divided. Further, a single factory 40 is exemplified as a measurement department (measurements of input side voltage, input side current, output side voltage, output side current, load factor, and so on) of the transformer. Even in this case, however, the number of such factories is not limited to "1" as in the drawing. For example, the factory may be replaced by a service

company having service branches in many areas. In the illustrated example, for the purpose of simplifying the explanation, the single business window 20 and the single dealer 30 are provided as the sales departments of the transformer, and the single factory 40 is provided as the measurement department of the transformer. And explanation will be made in connection with the aforementioned case.

A WWW server 21 connected to the Internet 1 is installed at the business window 20. The WWW server 21 is connected with a mail server 22 and also connected with a host computer 24 via a firewall 23. The host computer 24 is connected with a plurality of personal computers 27 via customer databases (DB's) 25 and a local area network (LAN) 26. The host computer 24, customer DB's 25 and personal computers 27 realizes a security policy by the firewall 23 in their internal network. Installed in the dealer 30 is a WWW server 31 which is connected at one side with the Internet 1 and also connected at another side with a mail server 32 and also connected at another side with a firewall 33. The firewall 33 in turn is connected with a host computer 34. The host computer 34 is connected at one side with a customer DB 35 and also connected at the other side with a plurality of personal computers 37 via a LAN 36. The host computer 34, customer DB 35 and personal computers 37 realize a security policy by the firewall 33 in their internal network.

Meanwhile, a WWW server 41 connected to the Internet 1 is installed in the factory 40. The WWW server 41 is connected at one side with a mail server 42 and also connected at the other side with a firewall 43. The firewall 43 in turn is connected with a host computer 44. The host computer 44 is connected at one side with various DB's 45 and also connected at the other side with a plurality of personal computers 47 via a LAN 46. The host computer 44, various DB's 45 and personal computers 47 realize a security policy by the firewall 43 in their internal network. In this connection, the various DB's 45 include at least "customer area", "in-charge person/schedule area" and "measured data area".

A method for supporting received orders of a transformer in accordance with an embodiment of the present invention will be detailed with use of the network configuration of the transformer orders supporting system shown in Fig. 1, a communication sequence among the customer, business window, dealer and factory shown in Fig. 2, web site pages of the business window shown in Figs. 3 to 9, web site pages of the dealer shown in Figs. 10 to 12, a response message of the dealer shown in Fig. 13, a customer response document shown in Fig. 15, a first response message of the factory shown in Fig. 16, a customer response document shown in Fig. 18, a second response message of the factory shown in Fig. 19, a combination

of a measuring circuit and a network configuration shown in Fig. 20, measured data shown in Figs. 21 and 22, a third response message of the factory including a renewal proposal shown in Fig. 23, and an in-charge person/schedule as one of in-charge person/schedule areas in various DB's shown in Fig. 24.

When a customer first specifies the location URL (uniform resource locator) of the web site of the business window 20 to be first connected on the WWW browser of the user terminal 10, this causes the user terminal 10 to issue an information transfer request to the WWW server 21 having the specified URL. The WWW server 21, when receiving the request from the user terminal 10, transfers a HTML (HyperText Markup Language) source code of the specified web site to the user terminal. The user terminal 10, when receiving the source code, analyzes the source code and displays displayable information thereon. The customer, when finding a link such as an image link on the display, issues a request, and the WWW server 21 transfers an image in response to the request.

A series of such operations will be explained in connection with specific images shown in Figs. 3 to 9. Fig. 3 shows a front page of the business window 20 in an electric company which manufactures and sells various industrial devices and equipment including the transformer. This page is information (of front page) 201 which was transferred from the business window 20

on the basis of a transfer request 101 issued from the user terminal 10. The page contains, as menus, various sorts of introduction files such as a "new product introduction" 201a, a "products-grouped-by-purpose introduction" 201b, an "energy saving proposal" 201c, a "products-grouped-by-type introduction" 201d and a "nationwide business windows" 201e as linked files. And when the customer, for example, clicks such a different-colored part, the user terminal 10 issues a request to the WWW server 21 having the corresponding information. The WWW server 21, when receiving the request, transfers the source code of a new specified page to the user terminal 10.

For example, when the customer, who wishes the transformer renewal, clicks a "transformer" 201dc in the " products-grouped-by-type introduction" 201d on the front page 201 of Fig. 3, such a "transformer" page 202 as shown in Fig. 4 is transferred to the user terminal 10. Through a series of such clicking operations, the customer can acquire new desired information. Figs. 5, 6 and 7 show pages 203, 204 and 205 obtained when the customer clicks a "feature 1" 202a, "feature 2" 202b and "feature 3" 202c on the page of Fig. 4, respectively, introducing feature articles of the transformer.

When the customer now desires a transformer renewal through the introduction articles of the feature pages 203 to 205 of the transformer, he, on the

basis of a message saying [For "new installation" or "renewal", contact a nearby "dealer".] given in bottom parts of the pages 202 to 205, clicks the "nationwide business windows" 201e on the front page 201 or one of "nationwide business windows" 202f, 203a, 204a and 205a on the pages 202 to 205. Fig. 8 shows a "business window" page 206 covering a group of branches from a "Hokkaido Branch" to a "Kyushu Branch". If the customer is located, e.g., in a business area belonging to a "Chugoku Branch", then he can click a "dealer" 206h to obtain such a page 207 of "Chugoku Branch area dealers" as shown in Fig. 9. Further, if the customer lives, e.g., in Hiroshima, then he can click one of two dealers 207e and 207f in Hiroshima, thus appearing a front page 301 of one dealer 30 as shown in Fig. 10.

Now a click of the dealer 207e or 207f causes the user terminal 10 to obtain a front page 301 of the dealer 30 of Fig. 10 following the page 207 of Fig. 9. This information transfer is carried out by an information link 28 apparently shown by a dashed line in Fi. 1. In actuality, however, this results from the user terminal 10 who issues such an information request as shown by a solid line 11 to the WWW server 31 of the dealer 30. Such a hyperlink structure is one of WWW features and results from the fact that the URL of the linked information is also included in data actually transferred and displayed. And when the operator clicks a differently-colored part with use of a mouse,

this causes a transfer request to be automatically issued to a computer having the associated information.

Returning to the front page 301 of the dealer 30 shown in Fig. 10, the customer can further see another page of the dealer 30. Fig. 11 shows a page 302 appearing when the customer clicks a "energy saving proposal" 301b, and Fig. 12 shows a page 303 appearing when the customer clicks a "super amorphous transformer" picture 302g in Fig. 11. In this way, various types of pages are prepared even in the respective dealers 30 so that the customer can know the summary of a desired transformer. In this conjunction, the pages of Figs. 3 to 11 are given as ones of the pages of web sites currently already opened and indicate well-known technical contents including the hyperlink structure.

In the present invention, an improvement unique to the present invention is provided from parts shown in bottom parts of the page 303 of Fig. 12. More specifically, for the purpose of widely and quickly spreading transformers having energy saving and environmental effects and for the purpose of easy understanding of the customer who accessed the web site of the sales department (business window or dealer), the sales department is associated with the measurement department in charge of transformer measurement to provide quick response and record thereof to the customer, contents of which will be detailed.

First, in the bottom part of the transformer introduction page 303 shown in Fig. 12, a "renewal" 303a and a "new installation" 303b are provided as menu items for customers. The present invention is designed so that, when a customer desires renewal and issues the order of the "renewal" menu 303a, the system performs quick communications between the customer and sales department and factory. The communications include firstly the communication for determination of the installation date of the measuring circuit to inspect the transformer currently being used by the customer, secondly the communication for setting of the date, place and person associated with the previous inspection for the installation of the measuring circuit, and thirdly the communication for renewal proposal of the transformer based on measured data obtained by the measuring circuit. In accordance with the present invention, these communications can be quickly carried out, the customer can quickly know quantitative data about what degree of economical effect of the transformer of the renewal proposal in energy saving when compared with the existing transformer currently being used and also about what degree of environmental effect of the new transformer in CO_2 reduction. Thus on the quantitative data, the customer can quickly decide the renewal for the energy saving and CO_2 reduction. In Fig. 12, when the customer desired "new installation", the type of the transformer

is nearly uniquely determined by customer's load demand. Explanation will now be made as focused on the "renewal" below.

In Fig. 12, when the customer clicks the "renewal" menu 303a and its click signal is received by the WWW server 31 of the dealer 30, the WWW server 31 registers the address of the customer's user terminal 10 in the customer DB 35, calls a first response message from the mail server 32, and transmits the message to the user terminal 10. The response message has such contents as, e.g., shown in Fig. 13 and previously prepared in the mail server 32 as a formatted document. The response message 304 contains roughly two messages. The first message is a contents introduction message to be serviced by the electric company with respect to the renewal. That is, the message shows a procedure up to the renewal including a first step of installing the measuring circuit to grasp the actual power use condition of the customer, a second step of proposing an optimum renewal proposal after measurement of the customer's actual power use condition for a predetermined period of time, a third step of giving an opportunity for the customer to judge the renewal proposal, and a fourth step of determining the installation date, etc., of the renewal transformer. The second message is an inquiry message for installation of the measuring circuit in the first step. That is, the message contains response columns

of "capacity", "phase number", "primary voltage", "secondary voltage", "number of transformers being installed", "manufactured year" and "manufacturer" of the transformer currently being used by the customer, a response column of occurrence or non-occurrence of "power failure", and a response column of a desired date for the installation of the measuring circuit. Further, since the installation of the measuring circuit in the above first step involves the works belonging to a special field of electrical work, it is often beyond dealer's business range. For this reason, the installation of the measuring circuit is often done by engineers of the factory as shown in the message of the first step. Accordingly, when the response message 304 is transmitted from the dealer 30 to the user terminal 10, if the address of the factory 40 is added to the CC field of the mail, then the factory 40 will take part in the communication thereafter. A solid line 38 in Fig. 1 corresponds to this communication line. In this connection, though not shown in Fig. 1, if the address of the business window 20 is added to the CC (carbon copy) field of the response message 304 from the dealer 30, then the CC of the response message 304 can be transmitted also to the business window 20. In the sequence of Fig. 2, parts shown by "CC" indicate broadcast communication.

In the user terminal 10 which received the response message 304, the customer can give a reply to

the response message 304. The replay is carried out by the customer who enters predetermined items in the entry columns of the response message 304 and clicks a button "send". Of the reply items; for the "capacity", "phase number", "primary voltage", "secondary voltage", "number of transformers being installed", "manufactured year" and "manufacturer" of the transformer currently being used by the customer; it is convenient to employ known pull-down menus as shown in Figs. 14A to 14G. For the item of customer's "capacity", he can click corresponding one or ones from a group of listed capacities. Even with respect to the "phase number", "primary voltage", "secondary voltage", "number of transformers being installed", "manufactured year" and "manufacturer", the customer can click corresponding one from a list in each menu. For the reply as to "possible" or "impossible" power failure (though the power failure is necessary from the viewpoint of safety), it is convenient to employ an alternative check box as shown by item ② in Fig. 13. With regard to the desired date of the measuring circuit installation, it is convenient to employ a pull-down menu to select one of listed dates as shown in Fig. 14H.

An example of reply results prepared by the customer in the aforementioned manner is shown in Fig. 15. The example of a reply document 102 indicates that the number of transformers to be renewed is five (two

transformers for 50kVA, two transformers for 500kVA and one transformer for 1000kVA), the power failure for the installation and wiring of the measuring circuit is "possible", and the desired date of the installation and wiring of the measuring circuit is October 20, 2001. And when the customer clicks the button "send", this causes the reply document 102 to be transmitted to the factory 40 (and also to the dealer 30 and business window 20 as its CC's).

In the factory 40 when received the reply document 102, the following processings are carried out. First, searching operation is carried out to know whether or not the factory 40 can cope with the date of October 20, 2001 as the installation/wiring date of the measuring circuit desired by the customer. In this connection, when already-set schedules of all in-charge persons are previously stored in in-charge person/schedule areas of various DB's 45, the conclusion of "possible" or "impossible" can be done by performing the searching operation for the data. An example of such schedule data is given in Fig. 24 as a schedule table of in-charge person "Taro....". According to this table, the schedule is absent on October 20, 2001, the factory 40 can cope with the customer's desired date. Second, a response message to the customer must be prepared. The response message includes roughly three messages. The first message is a confirmation message to the reply document 102 of the

customer. The second message is a return message indicating whether or not the measuring circuit can be installed and wired on the customer's desired date. The third message is an inquiry message to inquire the date and place of the installation of the measuring circuit for previous inspection. A result after the above two operations are executed is given in Fig. 16 as a response message 401.

The response message 401 corresponds to an order acceptance table into which the contents of the reply columns in the reply document 102 shown in Fig. 15 are summarized as the aforementioned confirmation message 401b. Next, a response message 401c indicates that, as a result of the above first searching operation, it was determined that the installation and wiring of the measuring circuit can be implemented on October 20, 2001. Further, an inquiry message 401d indicates the date and place associated with the previous inspection for smooth installation of the measuring circuit. In the inquiry message 401d, input columns for first to third wishes or preferences are provided for the "desired date" associated with the previous inspection for installation of the measuring circuit, input columns of "address", "company name", "name of person to be contacted" and "telephone number" are provided for the "place", and reply columns for specification of whether the transformer in use is installed indoors or outdoors and for specification of

whether or not the measuring circuit can be connected indoors are provided.

A formatted document for the response message 401 is beforehand prepared in the mail server 42, and the response message 401 can be prepared by automatically or manually inputting the confirmation message 401b and response message 401c in the formatted document. In this connection, one line of sentence 401a relating to "a continued patronage for the transformers manufactured by our company" can be automatically added through searching operation for the manufacturing company name in the customer's reply document 102.

The customer, when receiving the response message 401, he now starts replying works. With respect to the "desired date" (item ①) associated with the previous inspection, three preference dates are input with use of pull-down menus as shown in Figs. 17A and 17B. The "address", "company name", "name of person to be contacted" and "telephone name" in item ② are input by the customer. With regard to the installation place of the transformer (item ③), "indoors" is selected with use of a check box menu. Lastly, the indoors installation (item ④), "possible" is selected. A reply document 103 after the above customer's entries is shown in Fig. 18. The customer is only required to transmit the prepared reply document 103.

The factory 40 after receiving the reply document 103 performs operations which follow. First, the searching operation is executed for the previous inspection date desired by the customer and the schedule of the factory in-charge person. With regard to this, as already explained in Fig. 24, a conclusion that when and who can cope with it can be obtained by previously storing set schedule data for all the in-charge person in the in-charge person/schedule areas of various DB's 45 and searching the DB's for the data. In this case, the searching operation is carried out preferentially from customer's first preference, as a matter of course. Second a response message to the transformer is prepared. A result after these two searching and message-preparing operations were executed is shown by a response message 402 in Fig. 19. The response message contains roughly-four messages. That is, the first message is a copy message 402a of the confirmation message 401b shown in Fig. 16, the second message is a confirmation message 402b for the previous inspection date and place last determined, the third message is a response message indicative of the last-determined previous inspection date and visitor, and the fourth message is a reference message 402d directed to our company. A formatted document for the response message 402 is prepared in the mail server 42 as in the above case, the response message 402 is completed by automatically (or manually) inputting

necessary information in the formatted document. When the response message 402 is transmitted, this means that the preparation of the previous inspection has been completed.

Fig. 20 shows an example of a measuring circuit connected to the network configuration of Fig. 1, after the previous inspection of the customer's transformer is completed and the installation of the measuring circuit is completed. The measuring circuit shown in the upper part of Fig. 20 is a circuit when the supplied transformer is of a three phase type, for which reason, input-side voltage and current can be measured two VT(voltage transformer)'s and two CT(current transformer)'s. An output-side voltage can be measured by a power high tester and an output-side current can be measured by two CT's. Measured data from the installed measuring circuit of the customer transformer in its actually operated state can be sent in various manners to the factory 40. In the example of Fig. 20, the output of the measuring circuit is sent as electronic data into measured-data areas of the various DB's 45 in the factory from the customer or user terminal 10 via the Internet 1. Fig. 21 shows an example of measured results of a certain transformer for nine days, and Fig. 22 shows a day load curves of another transformer for four days. By precisely inspecting the actual power use condition of each customer transformer in its actual operation, an

optimum renewal proposal can be proposed.

Fig. 23 shows an example of a response message 403 containing a renewal proposal. More specifically, Fig. 23 is a proposal example of three renewal features and detailed renewal contents of each transformer, based on a result of the grasped power use condition of five transformers. For example, with respect to two Nos. 1 and 4 transformers of 50kVA, since the both have small general power and receptacle load, the both can be combined into a single 75kVA transformer. Even with respect to two Nos. 2 and 3 transformers of 500kVA, since the both have small loads less influenced by noise and voltage variations, the both can be combined into a single transformer of 500kVA. With respect to No. 5 transformer of 1000kVA, further, it has a capacity sufficient for a press ON/OFF load and, even when the capacity is reduced, it exercises a less effect on its workability. Thus the transformer can be replaced by a 750kVA transformer. As a result of such combinations of these transformers and renewal to energy saving transformers, the aforementioned load loss and no-load loss can be reduced, whereby reduction data in the power amount and fee can be quantitatively presented. Further, the reduction of the power amount enables quantitative presentation of even CO_2 quantity. Since such a response message 403 is proposed to the customer, the customer can concretely judge the renewal or non-

renewal.

In this way, in accordance with the present invention, close cooperative communication can be achieved between the sales department and the measurement department in charge of the transformer measurement, and the system can cope with the customer who accessed the web site of the sales department to provide quick response and record thereof. With respect to the record, mutual communication contents is left as electronic data and valid for promotion of smooth business data processing procedure.

In this connection, as shown in Fig. 5, "annual loss power amount fee (thousand yen/year)" can be calculated according to an equation of {[no-load loss (W) + load loss (W) × (load factor)^2]/1,000 × 365 (days) × 24 (h) × unit electricity charge (11 yen/kWh)/1,000}. From the calculated annual loss power amount fee and the no-load loss (W) and load loss (W) of the proposed renewal transformer and the above load factor, reduced power amount and reduced power fee can be estimated. Even a CO_2 reduction (t/year), as shown in Fig. 5, can be calculated from, e.g., a CO_2 emission coefficient of 0.423 (kg • CO_2/kWh) at a power receiving end in 1990.

With respect to the installation date setting of the renewal transformer in the step 4 shown in Fig. 15, the system can quickly cope with it on the basis of a customer's reply document 104 (Fig. 2) to the

response message 403 shown in Fig. 23 and of a dealer's response 305 (Fig. 2), and even the CO_2 reduction can be easily achieved by a technique shift 404 (Fig. 2) of the data calculation method from the measuring circuit.

Although the above explanation has been made in connection with the example where the response message (renewal proposal) 403 is transmitted from the factory 40 in the foregoing embodiment, the message transmission is not limited to the factory 40 but may be carried out from the business window 20 or from the dealer 30. In this case, in order to cope with it, it is only required that the business window 20 or dealer 30 be equipped with various DB's.

As has been explained in detail in the foregoing, in accordance with the present invention, the sales department issues the first response including customer's desired inquiry about the installation date of the measuring circuit to the customer who accessed the web site of the sales department; the measurement department in charge of the measurement of the transformer issues the second response including the installation date of the measuring circuit to the customer's reply to the first response, to thereby cooperative communication between the sales department and the measurement department in charge of the transformer measurement and to quickly cope with the customer who accessed the web site of the sales department to provide quick response and record

thereof. Accordingly, the social demand of early realization of energy saving and CO_2 reduction can be realized with highly excellent effects.



WHAT IS CLAIMED IS:

1. A method for supporting received orders of a transformer, comprising the steps of:

issuing a first response including a desired inquiry of a customer relating to an installation date of a measuring circuit of the transformer from a sales department to the customer who accessed a web site of the sales department; and

in response to a customer's reply to said first response, issuing a second response including the installation date of the measuring circuit of the transformer from a measurement department in charge of measurement of the transformer.

2. A method as set forth in claim 1, wherein a formatted document for said first response is previously stored in a mail server of said sales department.

3. A method as set forth in claim 1, wherein a formatted document for said second response is previously stored in a mail server of said measurement department.

4. A method for supporting received orders of a transformer, comprising the step of:

issuing a first response including a desired inquiry of a customer relating to an installation date of a measuring circuit of the transformer from a sales department to a customer who accessed a web site of the sales department, wherein

an address of a measurement department is added to said first response and said first response is transmitted to said customer so as to guide the customer's reply to said first response to said measurement department in charge of the transformer measurement and to issue a second response including the installation date of the measuring circuit of the transformer from said measurement department.

5. A method as set forth in claim 4, wherein a formatted document for said first response is previously stored in a mail server of said sales department.

6. A method for supporting received orders of a transformer, wherein a measurement department in charge of measurement of the transformer following a first response issued from a sales department including a customer's desired inquiry relating to an installation date of a measuring circuit of the transformer to a customer who accessed a web site of the sales department receives said customer's reply to said first response and issues a second response including the installation date of the measuring circuit to said customer.

7. A method as set forth in claim 6, wherein a formatted document for said second response is previously stored in a mail server of said measurement department.

8. A method for supporting received orders of a

* C L M S *

* C L M S *

transformer, comprising the steps of:

issuing a first response including a desired inquiry of a customer relating to an installation date of a measuring circuit of the transformer from a sales department to the customer who accessed a web site of the sales department;

in response to a customer's reply to said first response, issuing a second response including an inquiry of a customer's desired date relating to the installation date of the measuring circuit and to previous inspection of the installation of the measuring circuit from a measurement department in charge of measurement of the transformer; and

in response to a customer's reply to said second response, issuing a third response including an implementation date of the previous inspection from said measurement department.

9. A method as set forth in claim 8, wherein a formatted document for said first response is previously stored in a mail server of said sales department.

10. A method as set forth in claim 8, wherein formatted documents for said second and third responses are previously stored in a mail server of said measurement department.

11. A method for supporting received orders of a transformer, wherein a measurement department in charge of measurement of the transformer following a first

response issued from a sales department including a customer's desired inquiry relating to an installation date of a measuring circuit of the transformer to a customer who accessed a web site of the sales department receives said customer's reply to said first response, issues a second response including the installation date of the measuring circuit to said customer, and, in response to a customer's reply to said second response, issues a third response including an implementation date of the previous inspection from said measurement department to said customer.

12. A method as set forth in claim 11, wherein formatted documents for said second and third responses are previously stored in a mail server of said measurement department.

13. A method for supporting received orders of a transformer, comprising the steps of:

installing a measuring circuit to a customer's transformer;

receiving an amount of power of the transformer in an actual operating state in the form of electronic data from the installed measuring circuit; and

returning a renewal proposal of the customer's transformer on the basis of the received data.

* C L M S *