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SYSTEM AND METHOD FOR QUALITY CONTROL, INSPECTION AND AUDIT OF UTILITY ASSETS

CROSS-REFERENCE TO RELATED APPLICATIONS

This Patent Application claims the benefits of U.S. Provisional Patent Application Ser. No. 61/652,781, filed on May 29, 2012 and entitled "System And Method For Quality Control, Inspection And Audit Of Utility Assets," the entire contents of which are hereby expressly incorporated by reference.

FIELD OF THE INVENTION

The present invention relates generally to computer software; and more particularly to system and method for quality control, inspection and audit of utility assets (QCIA).

BACKGROUND

There are many assets above ground and below ground that need to be protected and avoided. Included in these assets are utility lines and components and protected areas, such as archeological sites and habitat of endangered species. There are millions of miles of utility lines around the world, some buried and some above ground. These utility lines include, without limitation, electric power lines, telephone lines, water lines, sewer lines, fiber-optic cable lines, natural gas transmission lines, natural gas distribution lines, and utility lines for transporting hazardous liquids.

Every year incidents occur in which mobile ground breaking equipment comes in contact with utility lines with costly results in loss of life and/or loss of money. In order to understand the full impact of such incidents, one would have to also include environmental damage and economic loss as a result of a service disruption.

There have been many attempts to address damage prevention when groundbreaking equipment is used around utilities and other assets that need protection. Non-exhaustive examples of these attempts include marking the location of a utility by painted lines. Commonly in the past, the utility companies and/or service companies are called to the site to place marks (spray the ground with an identifying color; for example, red for electric lines, yellow for gas lines and so forth) on the surface to show the location of a specific utility line and/or its components. However, such marking is not permanent and typically lasts only for the one earth moving operation, such as digging a trench, for which the utilities were marked.

Another approach was to make a record of the location of the utility lines as the line was placed in the earth. However, the accuracy of the location is dictated by the accuracy of the reference point. It has been found that attempting to locate a utility line based on this record has resulted in an error of up to 15 feet or more because of the inaccuracy in the position of the reference point.

Accordingly, there is a need for a system and method for quality control, inspection and audit of utility assets.

SUMMARY

In some embodiments, the present invention is computer implemented method for capturing, organizing and retrieving data for utility assets using RFID tags. The method includes: storing data related to a plurality of utility assets in

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a database, wherein the stored data include data about type of the utility asset; repair, documentation, testing validation, and inspection of the utility asset; programming a plurality of RFID tags for placement on a utility asset, by one or more processors; placing the programmed RFID tags on the utility asset. At least one of the programmed RFID tags may be placed on a specific segment of the utility asset as a segment tag, and at least one of the programmed RFID tags is placed near a specific joint of the utility asset as a joint tag. The method further includes: linking stored data related to the utility asset with the programmed data for the placed RFID tags, including location data of the placed RFID tags; and querying one or more of the placed RFID tags to retrieve data about the utility asset including data about the location of the utility asset, the specific segment and the specific joint, the type of the utility asset; repair, documentation, testing validation, and inspection of the utility asset, by one or more processors.

In some embodiments, the present invention is computer implemented method for capturing, organizing and retrieving data for utility assets using RFID tags. The method includes: storing data related to a plurality of utility assets in a database, wherein the stored data include data about type of the utility asset; repair, documentation, testing validation, and inspection of the utility asset; programming a plurality of RFID tags for placement on a utility asset, by one or more processors. The programming process may further include: retrieving a unique RFID tag identifier from the RFID tag using an RFID reader device, linking data associated with the utility asset to the unique RFID tag identifier, and checking out the programmed RFID tag from an RFID inventory database. The method further includes: placing the programmed RFID tags on the utility asset; linking stored data related to the utility asset with the programmed data for the placed RFID tags, including location data of the placed RFID tags; and querying one or more of the placed RFID tags to retrieve data about the utility asset including data about the location of the utility asset, the type of the utility asset, repair, documentation, testing validation, and inspection of the utility asset, by one or more processors.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exemplary overview, according to some embodiments of the present invention.

FIG. 2 is an exemplary process flow, according to some embodiments of the present invention.

FIG. 3 depicts an exemplary method for tag placement of an utility asset, according to some embodiments of the present invention.

FIG. 4 is an exemplary process flow for the opening and closing of a file or data set of information, according to some embodiment of the present invention.

FIG. 5 depicts an exemplary QC_SEGMENT, according to some embodiments of the present invention.

FIG. 6 is a representation of various types of QC_SEGMENTS that may be defined in a normal pipeline scenario, according to some embodiments of the present invention.

FIG. 7 shows a read/write process of locating RFID tags that have been placed on an INFRA, according to some embodiments of the present invention.

FIG. 8 is an exemplary process for reading RFID tags that are buried underground, according to some embodiments of the present invention.

FIG. 9 depicts an exemplary process flow for opening tags and closing tags, according to some embodiments of the present invention.