NGA NORTHEAST GAS ASSOCIATION
NYSEARCH

Technology Brief

UTTO vLocate® - Gas Pipeline RTK Mapper & Virtual Locating Device

Description: **Evaluate and test the functionality of the UTTO vLocate tool so that it can be used in the natural gas industry as a high accuracy asset capture device to map buried assets and locate them with precision.**

Status: **Testing feedback of the UTTO vLocate® device has been positive. Final comments are being incorporated into the design.**

BENEFITS

If a low-cost high accuracy GPS tool can be developed with the added ability for data capture and precision relocate-ability, it will provide: 1) a tool for efficiently constructing as-built data; 2) a method for use by non-locate and mark personnel, 3) a simpler approach for asset locating (thereby potentially lowering training and on-boarding time), and, 4) an optional solution in cases where traditional locating methods may not be viable.

BACKGROUND

NYSEARCH members have been specifically interested in asset location technologies to reduce damage to buried assets, especially with the capability to function to enhance traditional locating methodologies. A potential avenue for this capability is the capture and storage of high accuracy Global Positioning System (GPS) asset location data, which ideally would be captured during the as-built process. This data can be leveraged using a high accuracy GPS locator for a variety of end users in the utility's operations groups.

Traditional GPS capabilities precluded this type of application due to the higher than acceptable error in satellite GPS signal locators. A developing capability in use in a variety of industries is leveraging the Real Time Kinematic (RTK) correction service, which is provided by a base station network, which increases the accuracy of the GPS signal.

IPEG has developed a tool that guides a field user to locate back to a specified high accuracy GPS coordinate using an RTK network correction signal with high accuracy.

Previously, IPEG developed a handheld device with PG&E which provides the ability to locate back to known high accuracy GPS coordinates to within 6 centimeters (2.3 inches). PG&E brought this project to the broader NYSEARCH consortium to see if the development of additional capabilities were of interest, such as high accuracy GPS data capture, validation of the technology throughout the United States, and any enhancements that might be identified collaboratively.

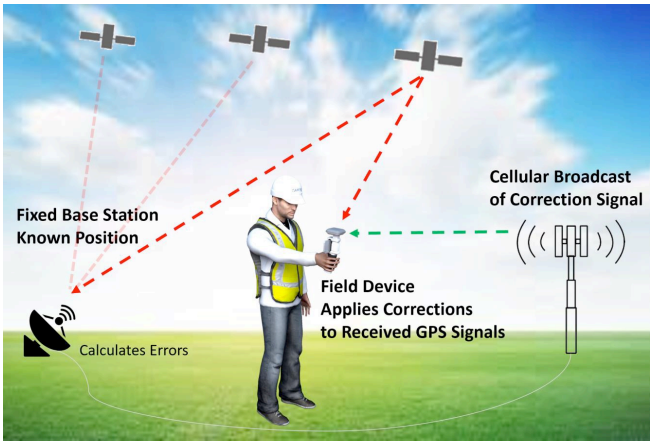

Figure 1: RTK Correction Service

TECHNICAL APPROACH

The objective of this project was to evaluate and test the functionality of the UTTO vLocate®

system, develop new functionality to permit end users to collect high-accuracy GPS data on assets using manually selected RTK networks, and conduct performance testing of the enhanced handheld mapper.

This NYSEARCH project was based on PG&E's prior success with IPEG's tool and the industry's need for tools that expand high accuracy data capture. Based on the success of PG&E's project, NYSEARCH outlined four major sequential work areas to be included in this project: 1) develop functionality to permit end users to manually search and select a public or private RTK network; 2) develop a smartphone application to allow the user to capture and store or recall asset details for precision locating including capture of asset details, including functionality to upload common GIS formats via a cloud dashboard for integration with the utilities GIS systems; 3) enhance the handheld device with a laser alignment tool to allow for accurate positioning and mapping; and 4) improve the user interface design and functionality via field testing with NYSEARCH members and incorporate their feedback.

IPEG separated the development tasks into five categories: 1) workshop and development of specifications, 2) integration of manual RTK correction service selection, 3) development of the mobile application, 4) integration of the laser alignment tool in the existing device, and 5) development of the API to allow import and export via the cloud dashboard view of captured or relocate data.

Functional and field testing utilizing the UTTO vLocate® tool continues. A high accuracy GPS tool that is used for as-built new construction drawings or for capturing data on assets unearthed during maintenance activities would allow a utility to efficiently build a comprehensive database of asset locations over time and will provide a low complexity method for utility personnel to locate assets, thereby lowering the training and on-boarding time as compared to traditional locating methods.

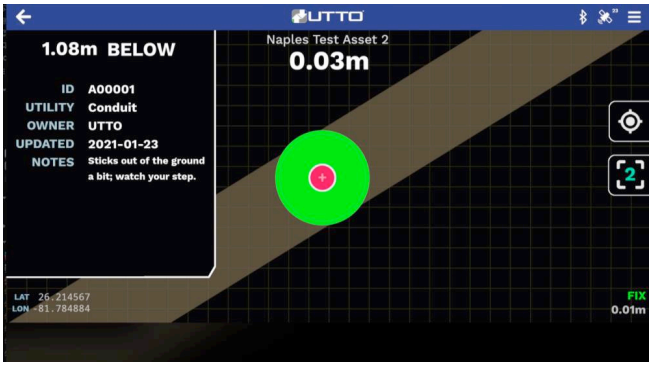

Figure 2: UTTO vLocate® Search and Connect to a Local Available RTK Base Station

PROGRAM STATUS

Overall feedback from testing has been positive. Once IPEG receives all the feedback regarding the UTTO vLocate® field testing, they will incorporate the updates into a more advanced product for release. An additional phase will only be necessary if support is needed for additional enhancements or to conduct additional field testing. This project will lead to a product that is optimized for the pipeline industry and commercially available. A final report is expected in early 2023.

Highlights

- A handheld product has been developed with high accuracy GPS coordinates that is being confirmed as capable of locating assets within 6 centimeters (2.3 inches) accuracy.
- Field testing to date is confirming potential.

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