LESSONS LEARNED FROM NON-DGPS POSITIONING SYSTEM USE AT MUNITIONS RESPONSE SITES

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Arcadis has utilized Non-DGPS positioning methodologies such as Robotic Total Station (RTS) on munitions response sites for over a decade and has recently implemented LiDAR-based Simultaneous Location and Mapping (SLAM) positioning on multiple project sites. SLAM based positioning provides a precise and cost effective method of acquiring positional data in GNSS denied environments during cued and dynamic surveys where RTS would previously have been the only viable option. Two encountered instances are examined here as use-case scenarios on the effectiveness of SLAM data collection where both methods were used for all tasks performed. Scenario one involved surveying individual points throughout dozens of acres of wooded area. This instance suggested that the application of RTS and SLAM can become challenging when both methods are used during data collection, as RTS is limited by obstructions and SLAM is limited by the size of its basemaps. If RTS points are surveyed across multiple SLAM basemaps, it can lead to pinch points that can slow data collection due to multiple setups of both instruments being required. Thus, reliance on one method may be beneficial as it eliminates the possibility of such issues arising. Further, it allows for a more focused and comprehensive training of staff on the positioning equipment chosen for the project, an imperative step in instances where experience with the machine is limited. Scenario two involved digital geophysical mapping in a wooded area with steep, rocky terrain. Results from SLAM-positioned data show greatly improved positioning over the RTS through the incorporation of the SLAM Inertial Measurement Unit (IMU) data resulting in properly positioned readings, regardless of steep slopes or abrupt antenna swing caused by rough terrain. Data gaps are also minimized if not eliminated during data collection when the SLAM is utilized, lessening the need to return to areas where collection has already occurred. Further, dynamic data collection with SLAM is not impeded by obstructions that otherwise hinder collection with RTS and allows for continuous data collection across a survey area. This poster provides an overview of these use-case scenarios and will assess performance of the technologies in each scenario. Results of these assessments are presented as lessons learned to aid in future determinations of which method is most suitable to investigate munitions response (MR) related problems.