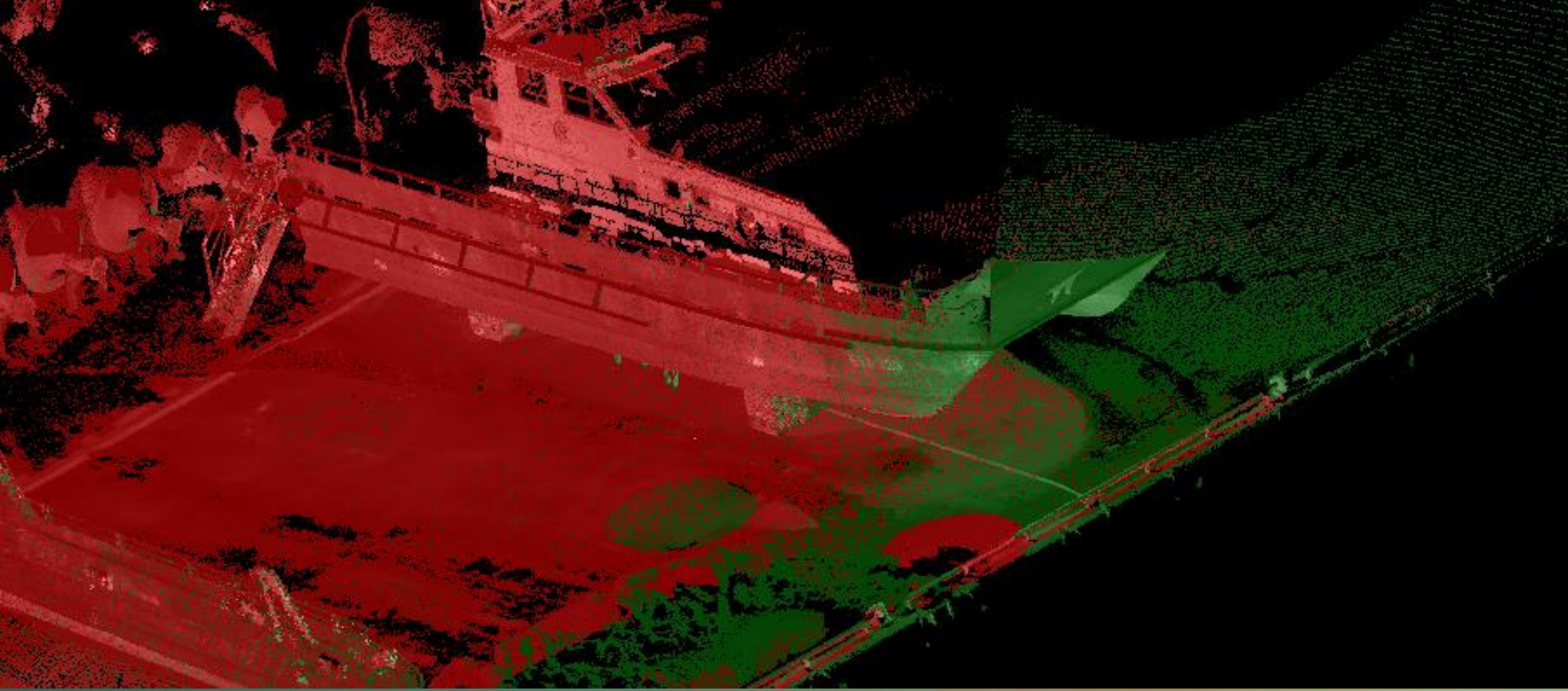


PHOTOGRAMMETRY AND LIDAR: COMPARISON OF TWO METHODS FOR VESSEL COORDINATE SURVEY (VCS)

INTRODUCTION

- The goal of this work was to test two methods for vessel coordinate survey (VCS).
- Two vessels were surveyed, and results compared with each other and previous offsets.
- Conclusions were made about which method to prefer considering possible limitations

TOPICS

- Hydrographic survey error budget
- How to reduce errors
- Methods for VCS
- Performed tasks
  1. preparations
  2. survey
  3. data processing
- Results and conclusions

MULTIBEAM SURVEY ERROR BUDGET

Horizontal uncertainty

- GNSS horizontal accuracy
- Antenna lever arm
- Raytracing error
- HRP error
- VCS error

Vertical uncertainty

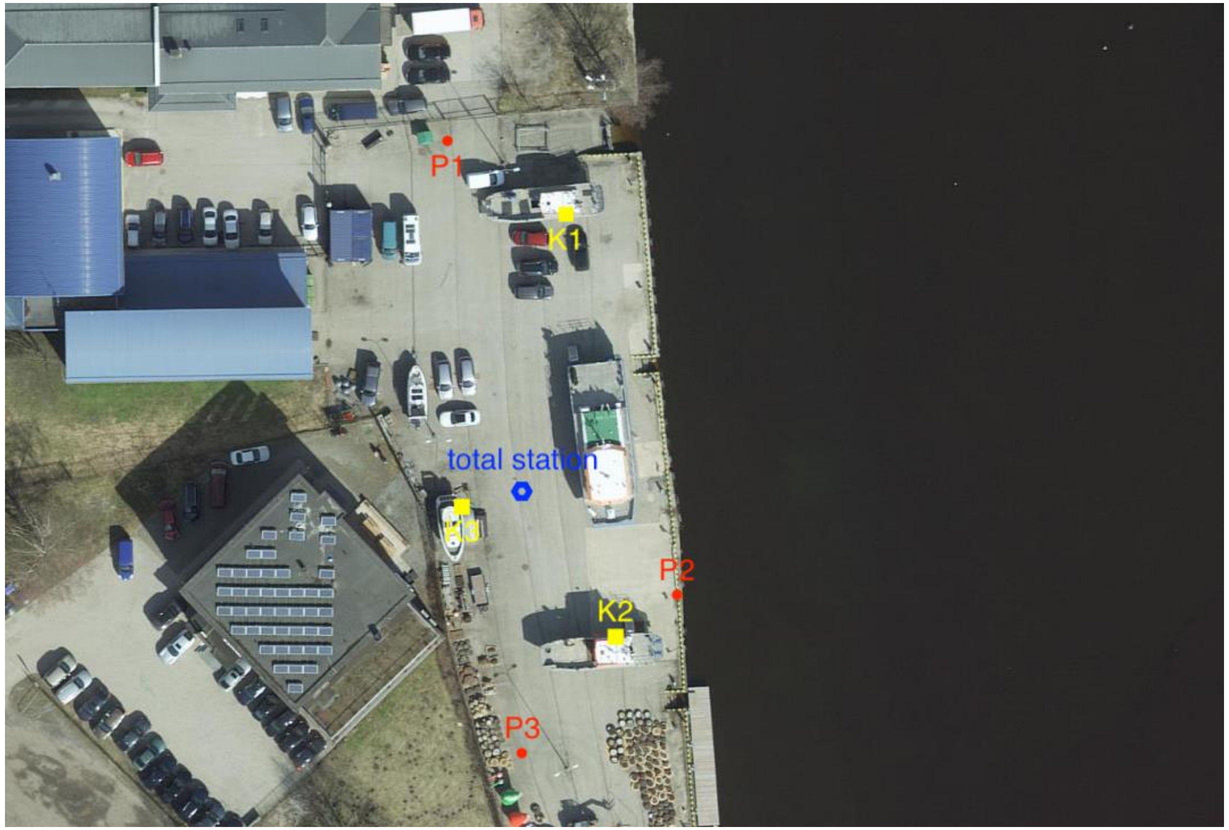
- GNSS vertical accuracy
- Depth error
- Raytracing error
- HRP error
- VCS error
- Sound velocity error
- Tide error
- Vessel draft error

Modern methods for vessel coordinate survey

- Total station
- 3D LIDAR scanning
- Photogrammetry

PERFORMED TASKS

1. Preparations
2. 3D scanning
3. Drone photogrammetry
4. Data processing

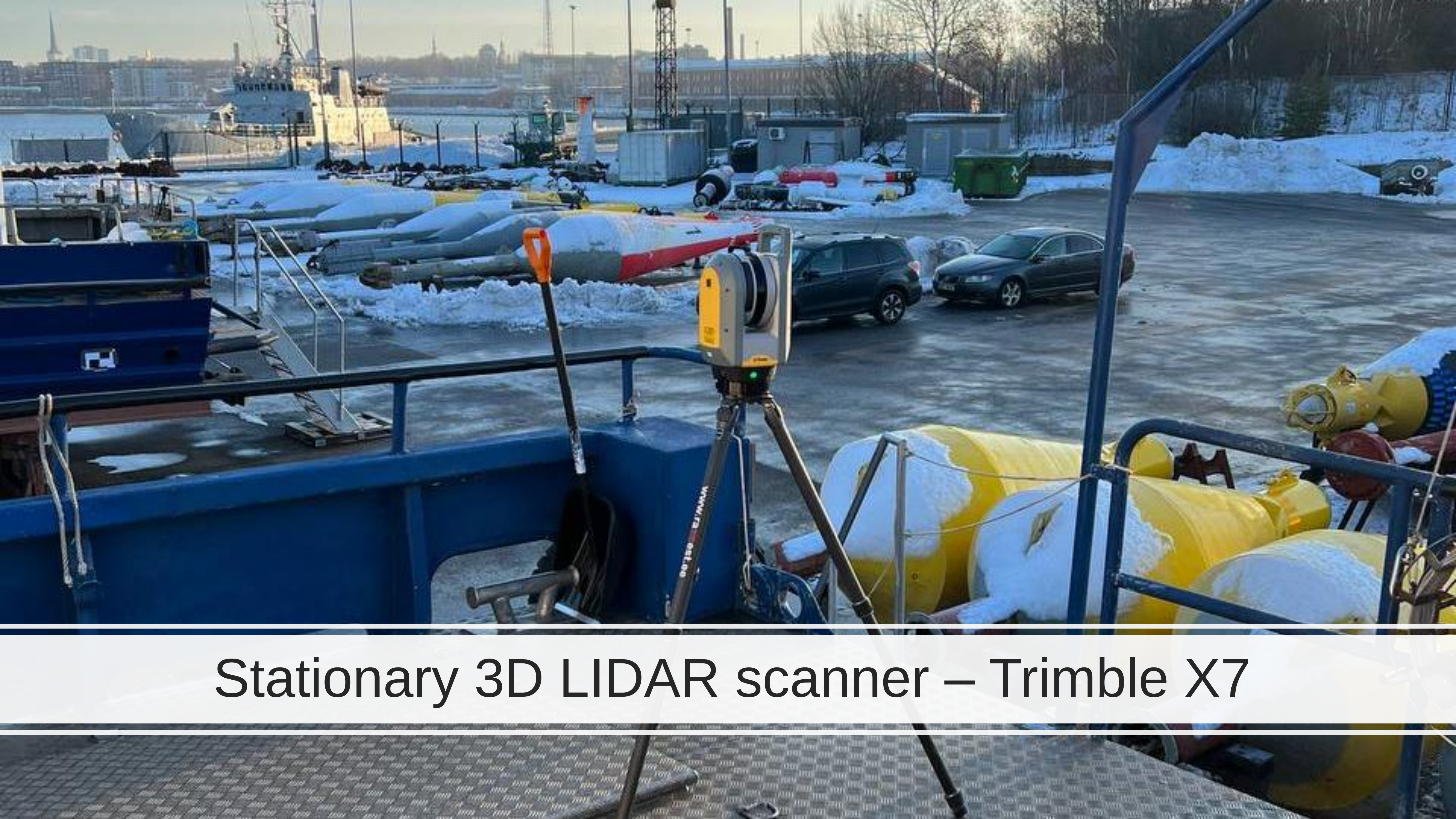


- EVA-320
- EVA-301

PREPARATIONS


EVA-019
LAEVAKONTROLL
PORT STATE CONTROL

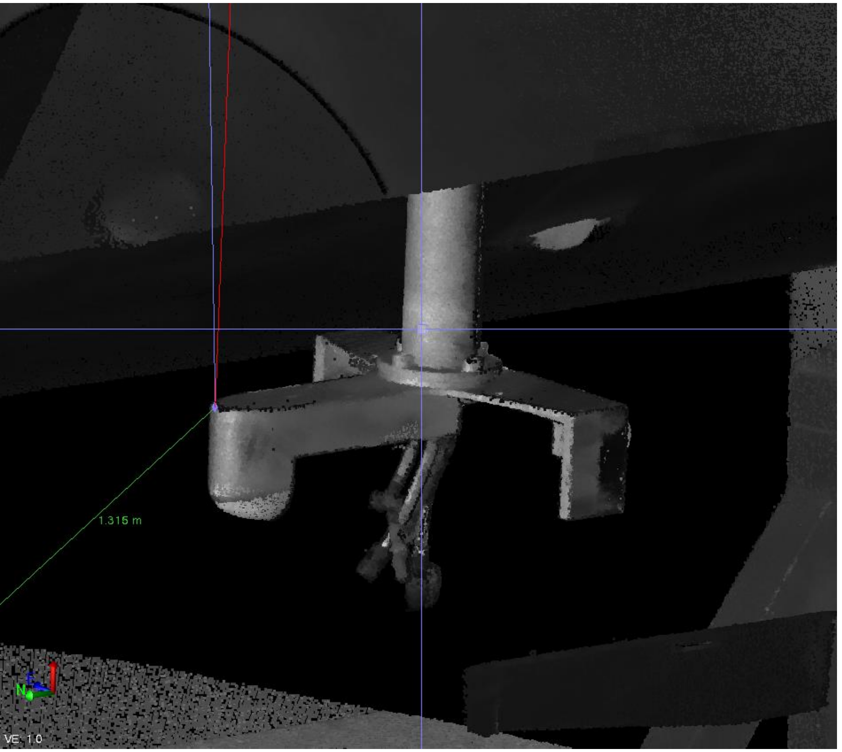
Photogrammetry
DJI Phantom 4 RTK
DJI Mini SE

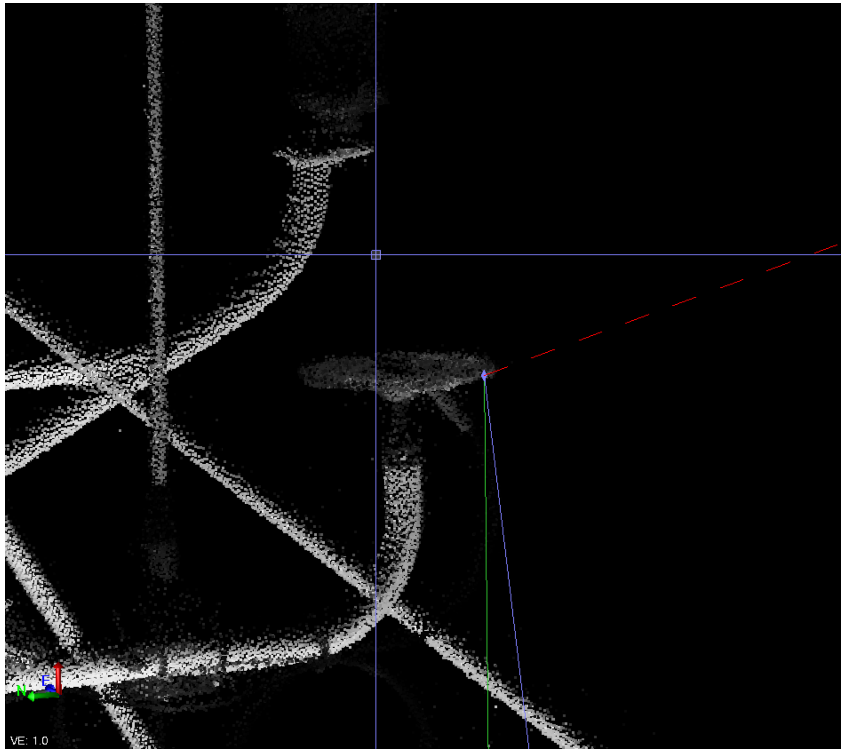


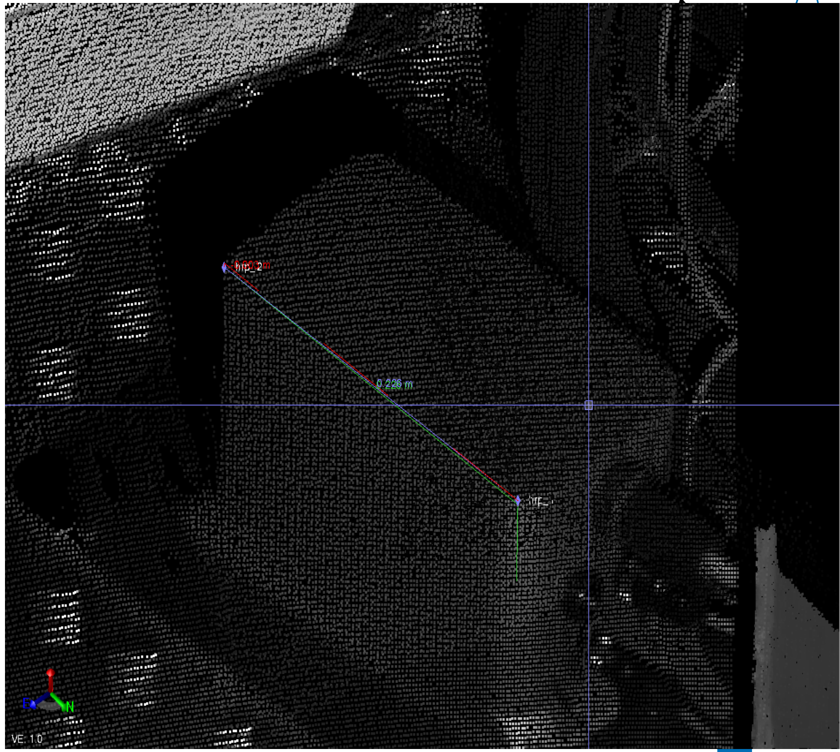
Stationary 3D LIDAR scanner – Trimble X7


EVA-320

Data processing





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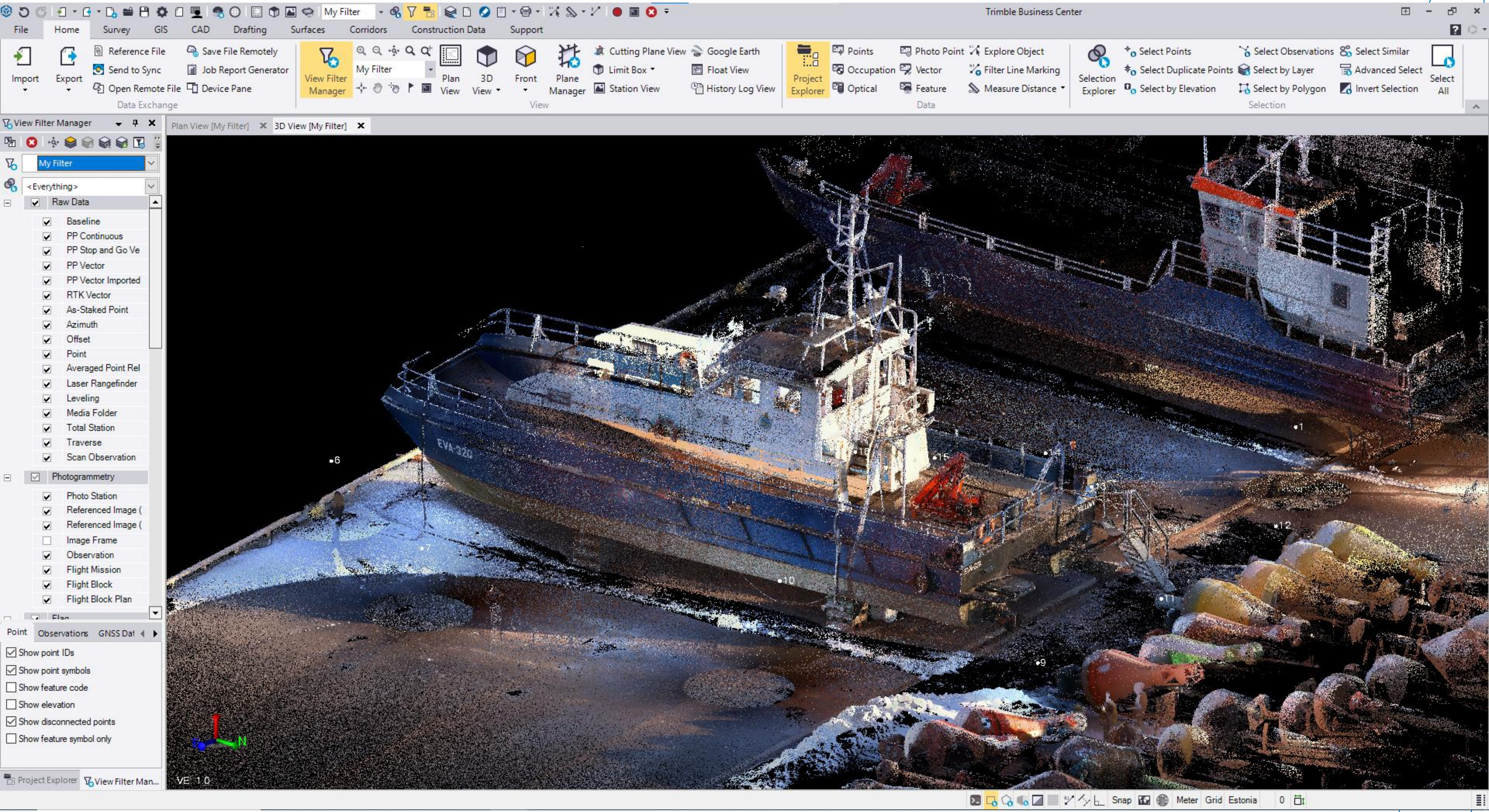
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My Filter
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Corridors
Construction Data
Support
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Reference File
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Open Remote File
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Job Report Generator
Device Pane
Data Exchange
View Filter Manager
Plan View
3D View
Front
Plane Manager
Cutting Plane View
Limit Box
Station View
Google Earth
Float View
History Log View
View
Project Explorer
Points
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Optical
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Feature
Explore Object
Filter Line Marking
Measure Distance
Data
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Select Points
Select Duplicate Points
Select by Elevation
Select Observations
Select by Layer
Select by Polygon
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Laser Rangefinder
Leveling
Media Folder
Total Station
Traverse
Scan Observation
Photogrammetry
Photo Station
Referenced Image (
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Image Frame
Observation
Flight Mission
Flight Block
Flight Block Plan
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Observations
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Show point symbols
Show feature code
Show elevation
Show disconnected points
Show feature symbol only
Project Explorer
View Filter Man...
EVA-320
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RESULTS

- 3D scanning

1. EVA-320

X offset – 3,795 m

Y offset – 0,903 m

Z offset – 9,395 m

HRP offset - 0° 45′ 6″

2. EVA-301

X offset – 0,817 m

Y offset – 1,047 m

Z offset – 6,180 m

HRP offset – 0° 1′ 24″

- Photogrammetry

1. EVA-320

X offset – 3,83 m

Y offset – 0,898 m

Z offset – 9,397 m

2. EVA-301

X offset – …

Y offset – …

Z offset – …

RESULTS

	3D scanning	Photogrammetry
Relative precision	✓	✓
Relative simplicity	✓	✗
Practical usability	✓	✗
Instruments cost	✗	✓
Survey time	✗	✓
Data processing time	✓	✗
Min required personnel	✓	✓
Dependence on the weather	✓	✗
Unexpected restrictions	✓	✗


9
THANK YOU FOR ATTENTION!