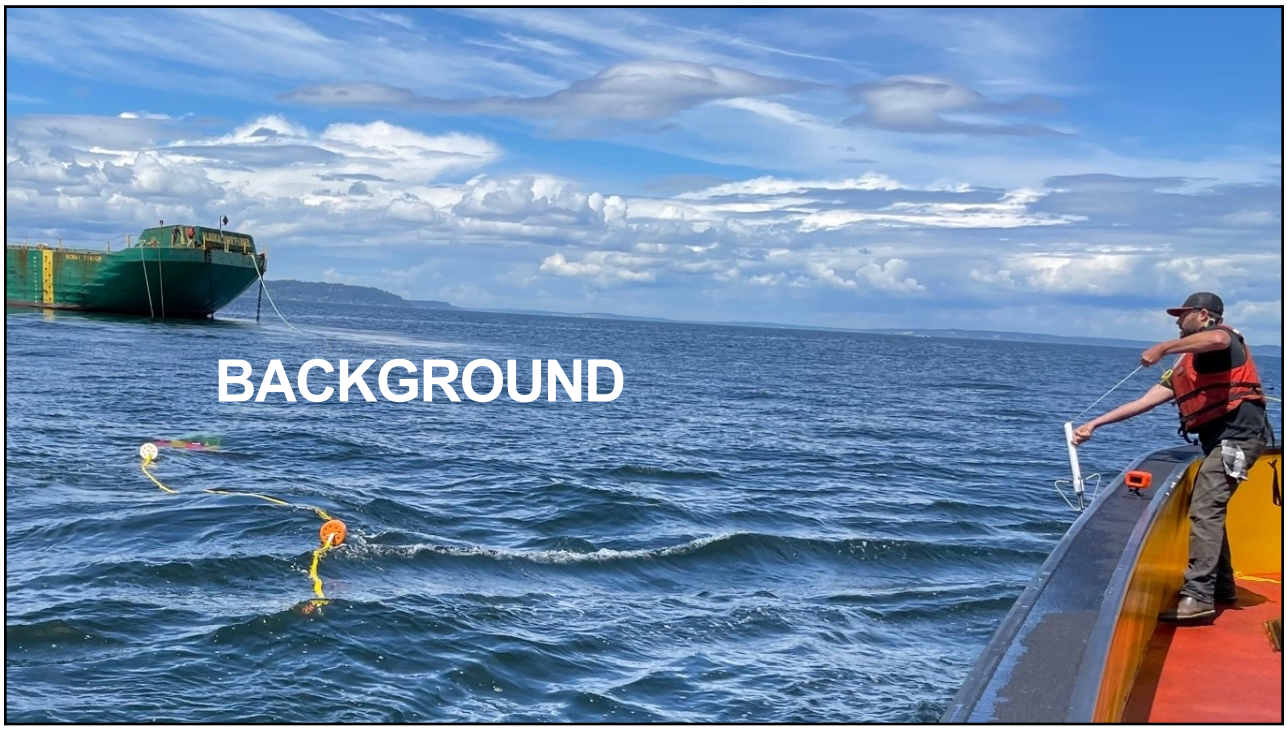
09.16.2021

EMERGENCY TOWLINE DEPLOYMENT PRACTICAL TRIALS.

Glosten

1



2

BACKGROUND

WHY EVALUATE TOWLINE DEPLOYMENT TECHNOLOGY?

3

BACKGROUND

PREVIOUS BAT STUDY.

Glosten conducted a best available towline deployment technology study in May 2020.

LITERATURE REVIEW

- Regulatory review
- State of the industry

CASE STUDIES

- Descriptions of relevant incidents
- Identification of lessons learned

RECOMMENDED TECHNOLOGIES

- Device evaluation
- Presentation of best available technologies

4

4

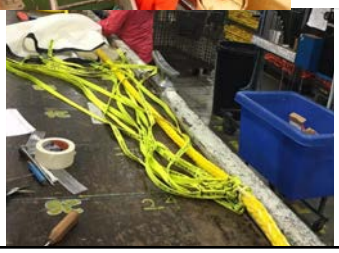
BACKGROUND

RECOMMENDED DEVICE TYPES.

The previous BAT study recommended three device types for service

PYROTECHNIC
- Long range
- Easy to use

PNEUMATIC
- Passive projectile
- Reusable



SURFACE FLOAT LINES
- Suited to heavy weather
- No light cordage

5

5

BACKGROUND

TRIAL PURPOSE.

EXPLORE PRACTICAL CHARACTERISTICS

EVALUATE PREVIOUS STUDY'S FINDINGS

TEST DEVICES UNDER REAL-WORLD CONDITIONS

IDENTIFY DIFFERENCES BETWEEN SPECIFICATIONS AND REAL USE

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6

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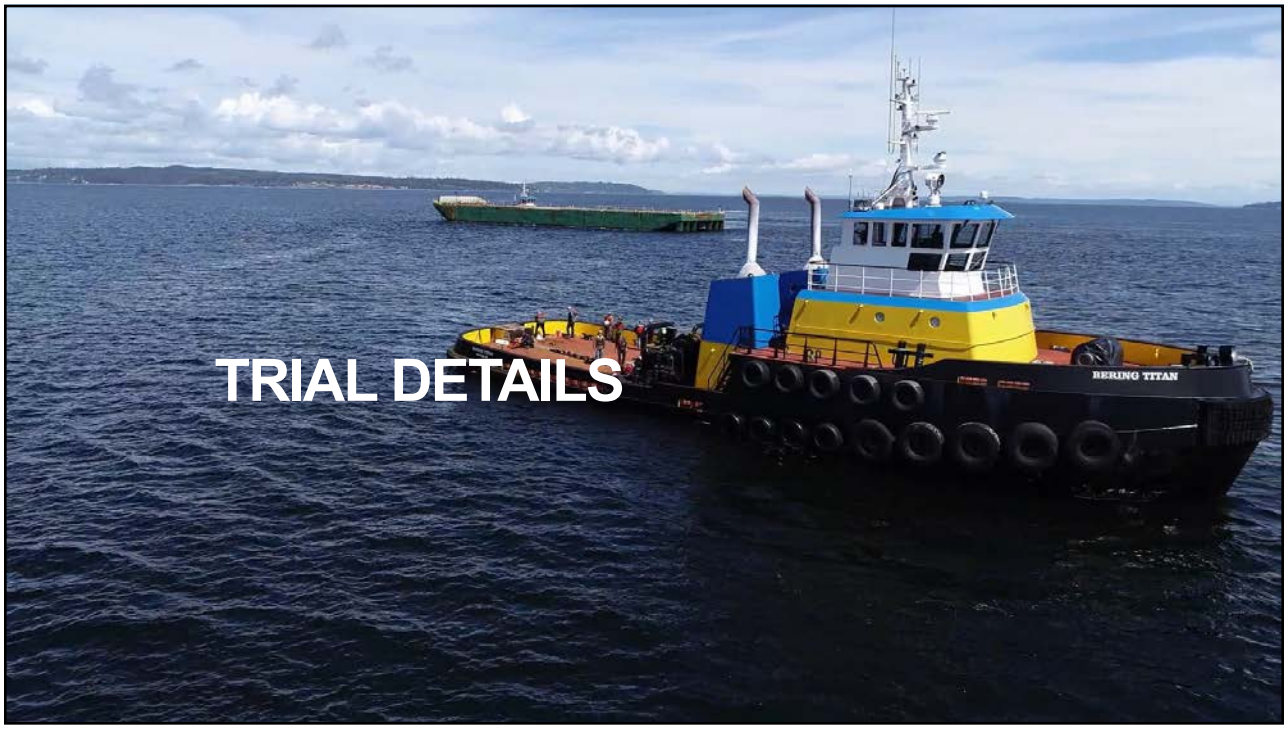

TRIAL DETAILS

7

LINE THROWERS TESTED.

RESTECH PLT-SOLAS

- Pneumatic
- Recommended in previous study

RESTECH PLT-MULTI

- Pneumatic
- Multi-purpose

BUMERANG BLT-250

- Pneumatic
- More cost effective than PLT devices

IKAROS LINE THROWER

- Pyrotechnic
- Longest range

8

8

TRIAL DETAILS

TESTING CRITERIA.

EASE OF USE
- Ergonomics
- Weight

EFFECTIVENESS
- Range
- Accuracy and wind deflection

RELIABILITY
- Range uniformity
- Ease of reload

SAFETY
- Firing control

9

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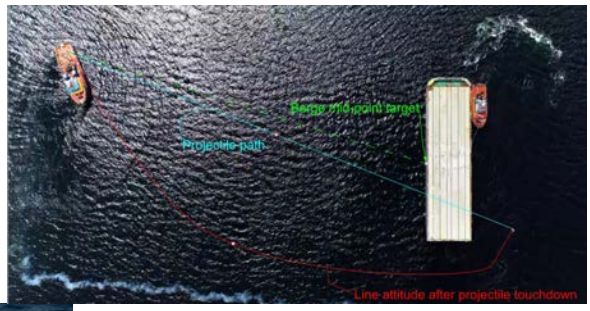
ADDITIONAL CRITERIA ASSESSED.

CROSSWIND LINE DEFLECTION
- Trailing lines showed significant deflection in crosswinds



DEVICE BUILD QUALITY
- Device damage upon firing poses a safety and reliability risk

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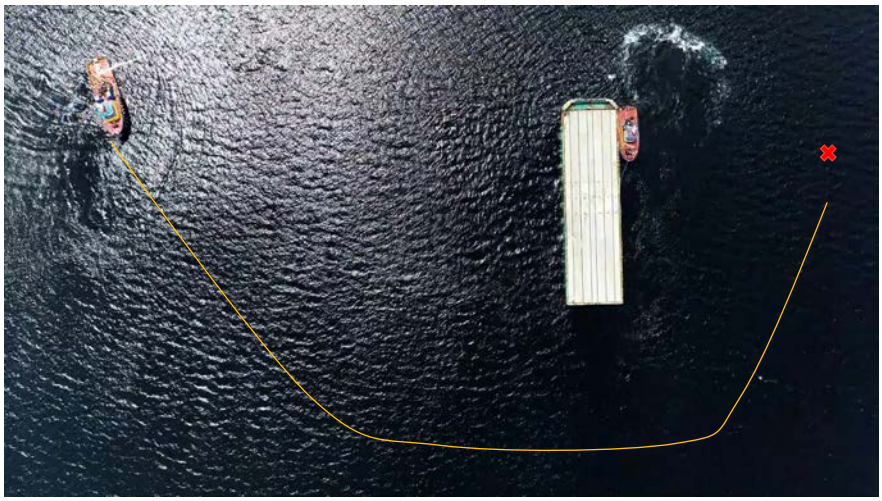
10

LINE DEFLECTION.



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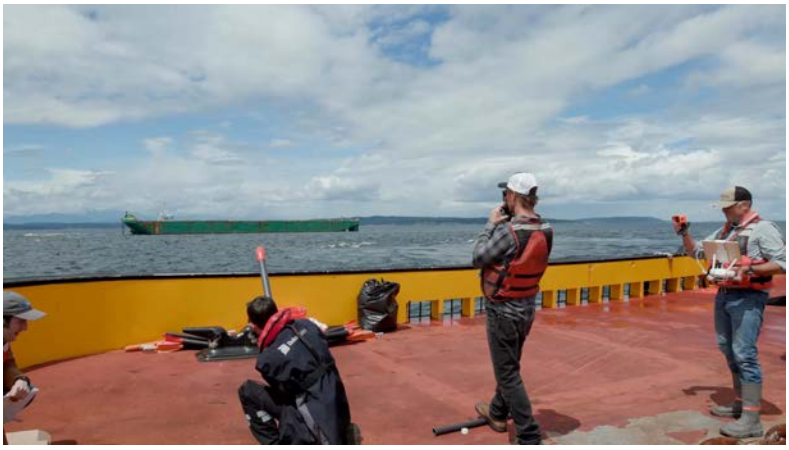
DEVICE BUILD QUALITY.



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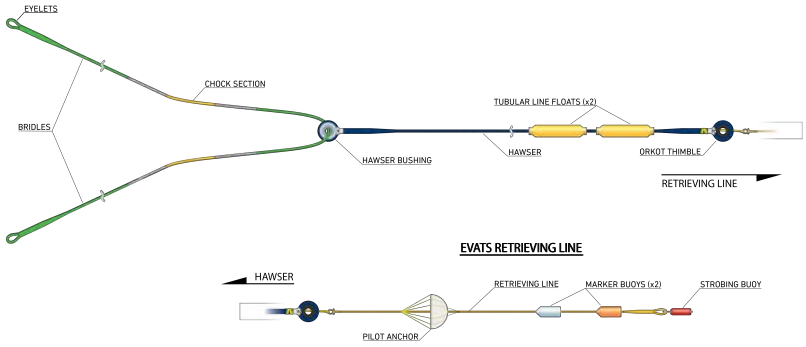
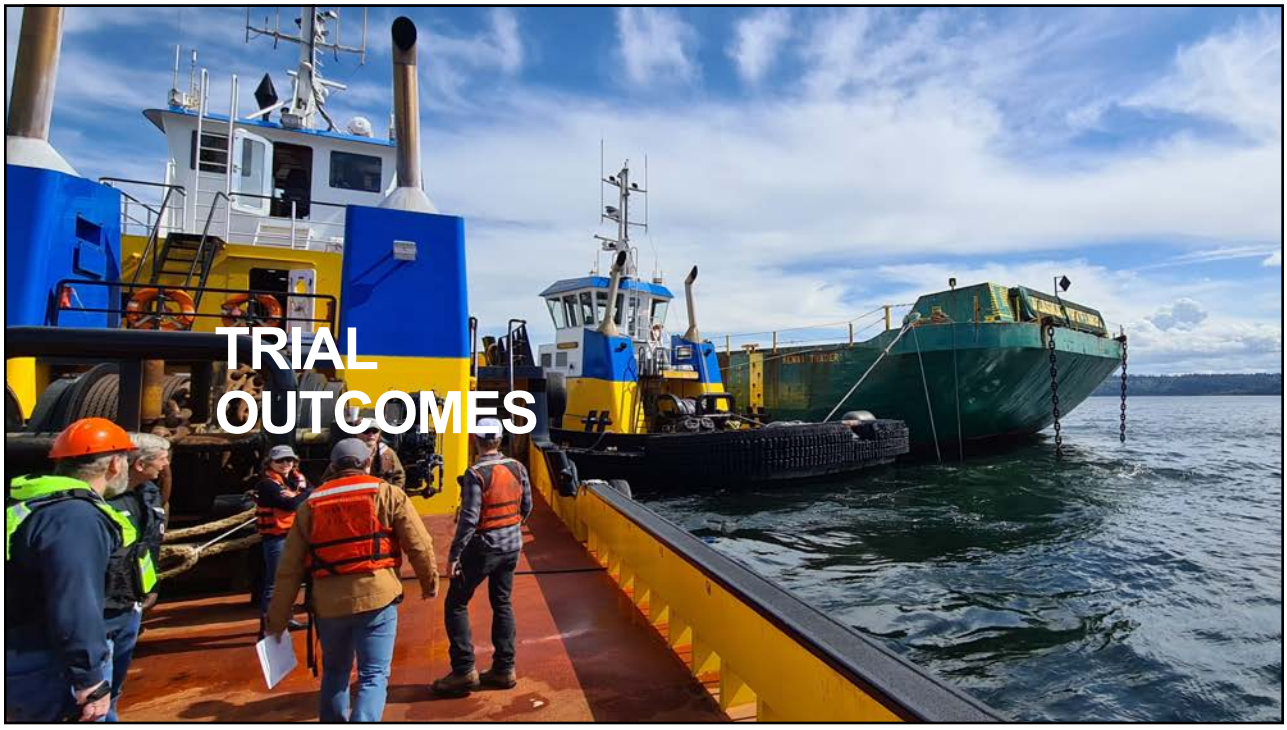


SURFACE FLOAT LINE SYSTEM.

- Deployable and recoverable in heavy weather
- Allows rescuers to maintain safe distance
- Tested for ease of use and deployment time

13

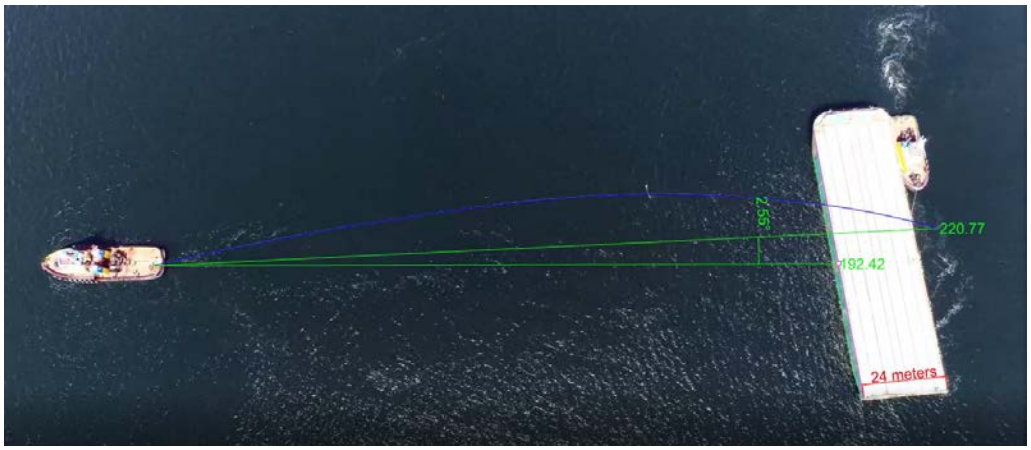
13



14

ANALYSIS.

- Aerial footage was analyzed for each shot
- Distances, angles and line attitude were calculated and recorded



15

15

OUTCOMES

DEVICE SCORING.

Device	Overall Score
Restech PLT-Multi	97
Restech PLT-SOLAS	97
Ikaros Line Thrower	96
Bumerang BLT-250	90

- Restech devices met and exceeded all requirements
- Despite similar design, the BLT-250 fell short due to build quality

16

16

OUTCOMES

MATRIX SCORE OUTCOMES

- All devices fell within 90-100 range
- Differences came from range and accuracy ratings

DEVICE FUNDAMENTALS

- Ergonomics
- Weight
- Ease of reload
- Firing control

RANGE

- Pyrotechnic devices had a distinct range advantage
- Pneumatics generally met test requirements

ACCURACY

- Pyrotechnics proved hardest to aim and were susceptible to deflection
- Pneumatics were precise and only had moderate wind deflection

17

17

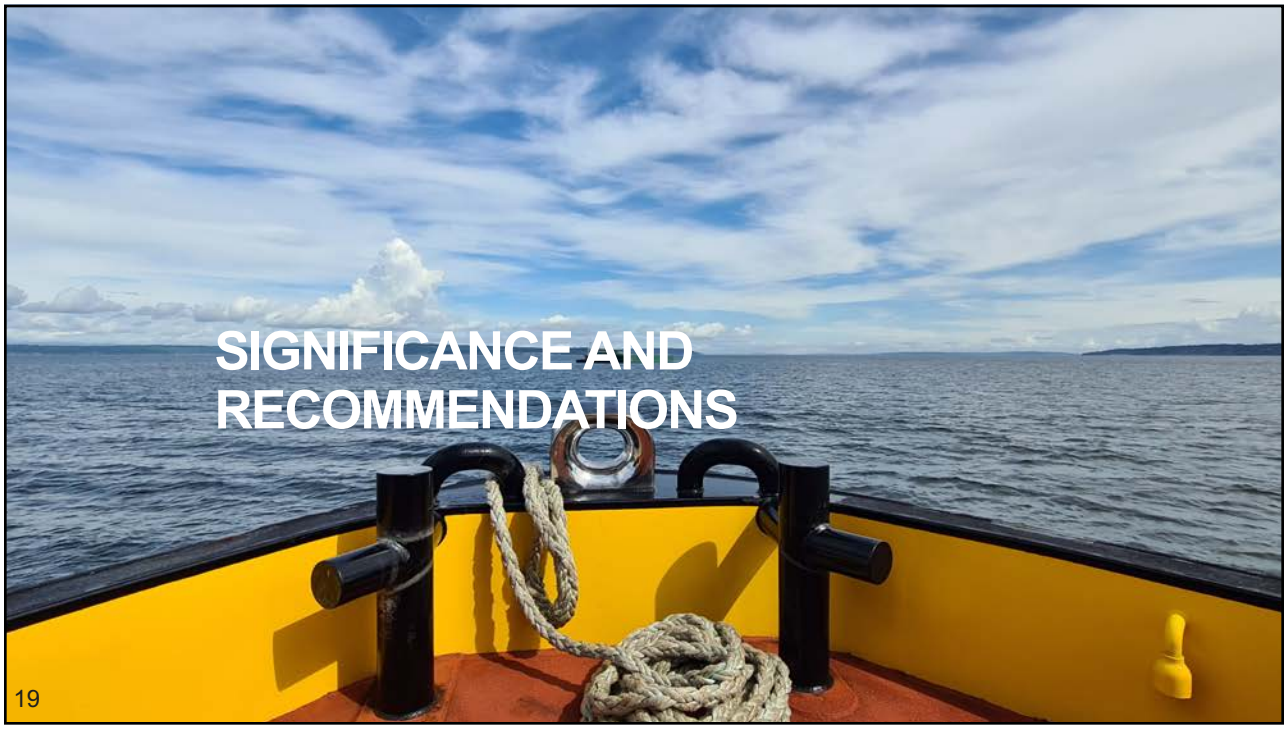
OUTCOMES

FLOAT LINE RESULTS.

- Deployed and streamed out directly away from the disabled vessel as designed
- Buoys and line were clearly visible and recoverable on the surface

18

18



19

PNEUMATIC DEVICES.

- Highly accurate, easy to use
- Passive projectile is ideal for tanker operations

20

20

RECOMMENDATIONS

PYROTECHNIC DEVICES.

- Exceptional range capability
- Most difficult to aim with accuracy
- Incendiary projectile poses safety risk

21

21

RECOMMENDATIONS

PYROTECHNIC DEPLOYMENT.

22

22

RECOMMENDATIONS

SURFACE FLOAT LINE.

- Performed as expected
- Safe, effective deployment/recovery

23

23

RECOMMENDATION

MAJOR TAKEAWAYS

- Identified devices are competitive
- Best technology is situationally dependent

PNEUMATICS
Safe and effective way to make contact

FLOAT LINES
Well suited for use in high wind and seas

PYROTECHNICS
High range and velocity with increased safety risk

BUILD QUALITY
Selection of well-made device is important to efficient use

24

24

Q&A

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25