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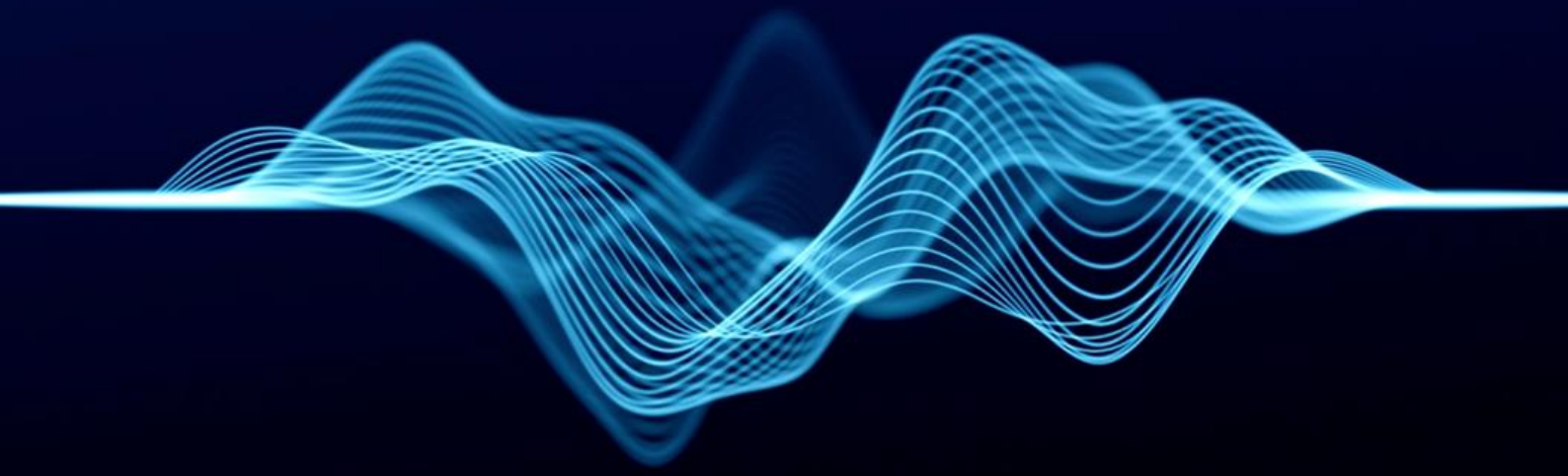


Automated Image Assessment

Evaluating video images for quality issues

May 2022

1. KEY PERSONNEL

PRODUCT OWNER
TBD

TECHNICAL LEAD / TEAM
TBD

PROJECT MANAGER
Darren Smith

PROJECT SPONSOR
TBD

2. SUMMARY

Without a “human-in-the-loop”, it is not possible to sufficiently assess the quality of an image from an HD video camera (and to a lesser extent stills images).
There are mechanisms to check lighting levels on stills cameras, not so in a video feed, which is likely to remain a requirement, particularly in IMR for the foreseeable future.

Humans are required to evaluate images in terms off;

Visibility.
Generally a factor of sediment load in water column. Lighting adjustment can help, but generally beyond control.

Quality
Camera zoom and alignment, light level and alignment, colour balance and physical obstacles are all under operator control, if done poorly, this can render the data unfit for purpose.

In remote or AUV based operations, it is not possible to have continuous human oversight of visual data quality. With an anticipated reduced crew acquiring the data, the current position of “Online” QCing these elements also becomes more difficult.

3. BUSINESS CASE

When HD cameras are used for asset inspection (as opposed to CathX/similar FDI type inspection), this is a variable that requires monitoring and potential adjustment.

If data is collected that cannot be used to determine the status of the asset, and the fault could have been rectified by user input (i.e. – not a “visibility” issue) then we are potentially obliged to re-acquire the data at our cost.

4. SCOPE

Automated assessment of general visibility
Automated Quality assessment
Notification/Flagging to User or automated adjustment to rectify issue

5. TECHNICAL SOLUTION

TBD

6. EFFORT

TBD

7. SUCCESS CRITERIA

TBD

8. RISKS AND MITIGATION

Too many variables in environmental conditions for model to be fully reliable
Insufficient volume of example data to train model

- Possible use of synthetic data

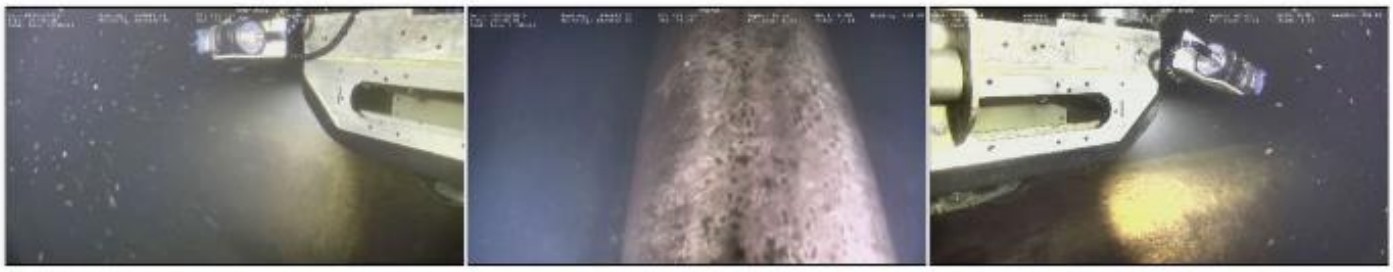
9. BUDGET

TBD

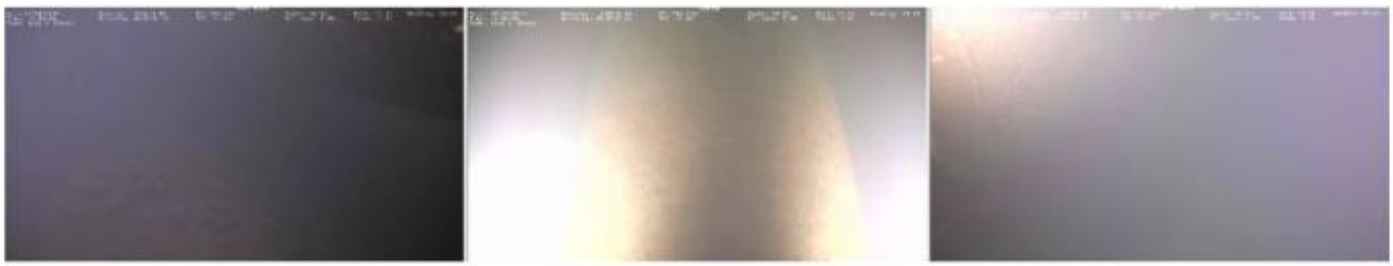
10. COMMENTS

The following illustrates Quality and Visibility issues such a system would be required to identify;

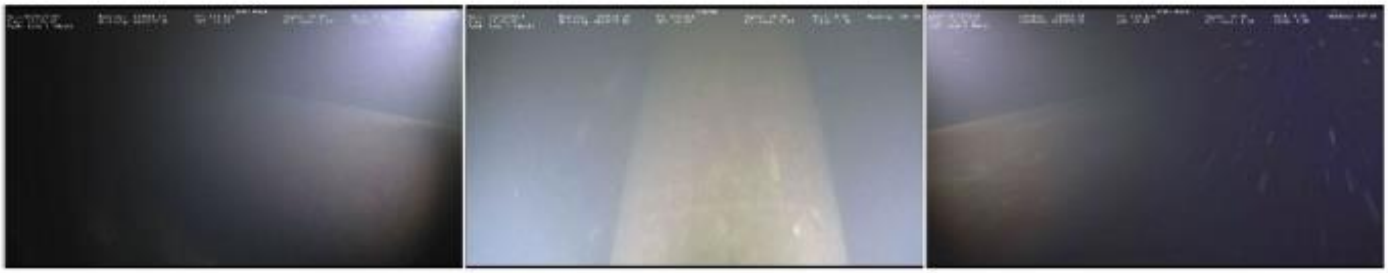
Quality issues:



Obstruction in field of view

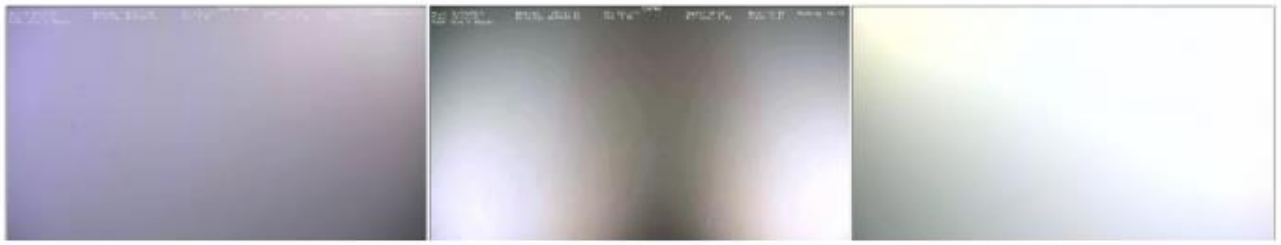


Over lit

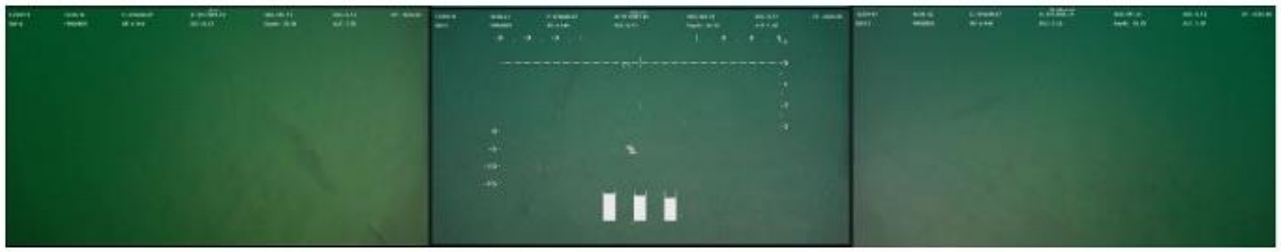


Under lit

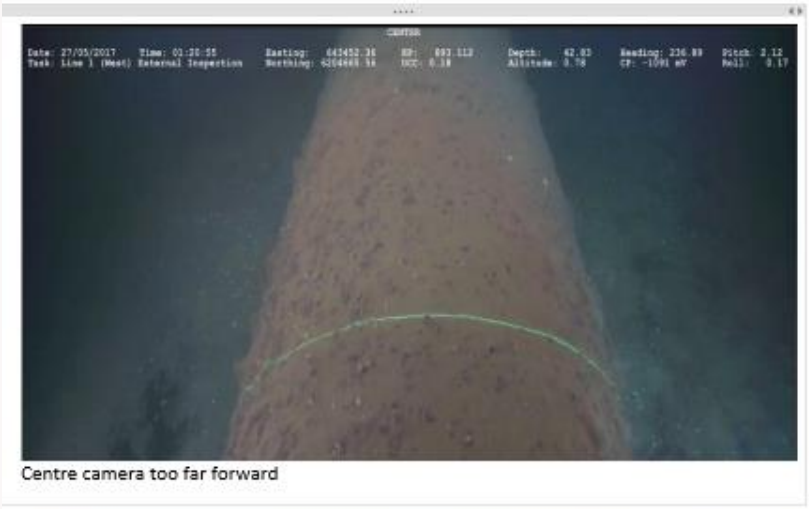
10. COMMENTS - continued



Lights angled into cameras



Poor colour balance



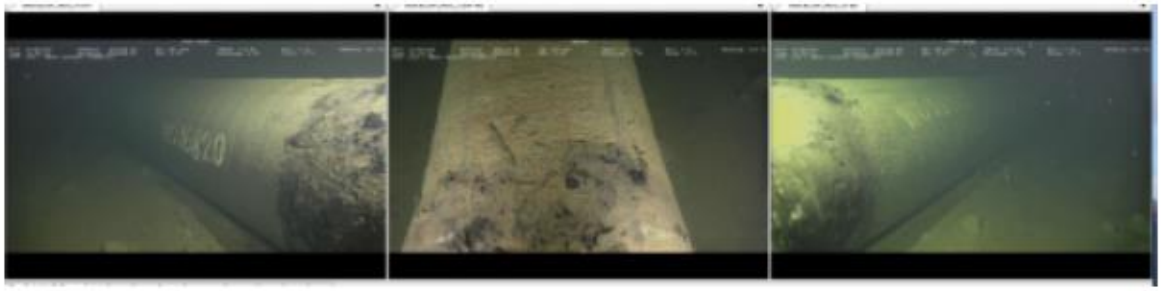
Centre camera too far forward

Boom camera too far out

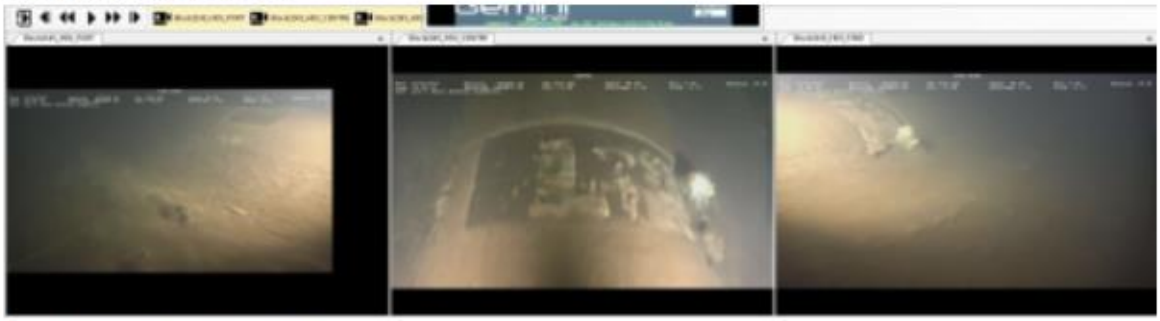
10. COMMENTS - continued

Visibility issues:

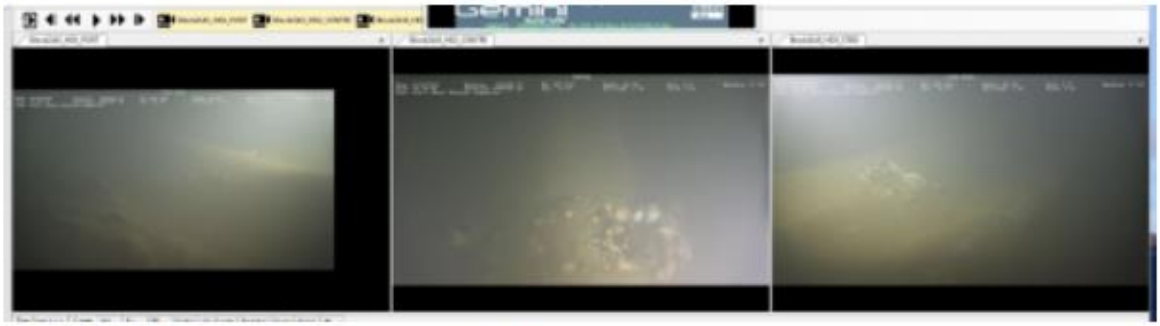
Very Good visibility Crystal clear (e.g. when ROV stationary on pipe in clear water)



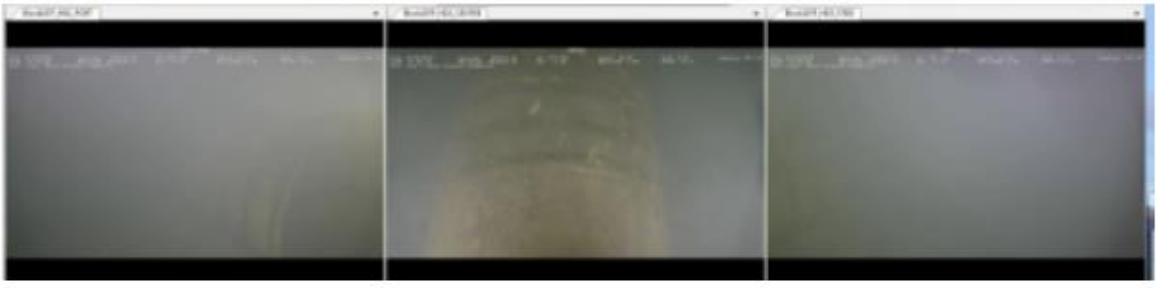
Good Visibility Can see everything we need to see



Moderate Visibility Marginal, neither good nor bad. Maybe surrounding seabed obscured



Poor Visibility Can see pipe but difficult to see or can't see laser & details like cracks



Very Poor Visibility Can't see pipe