



PPSA Seminar 2022

Navigating difficult underwater installation - an I/I challenge

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INTRODUCTION / BACKGROUND

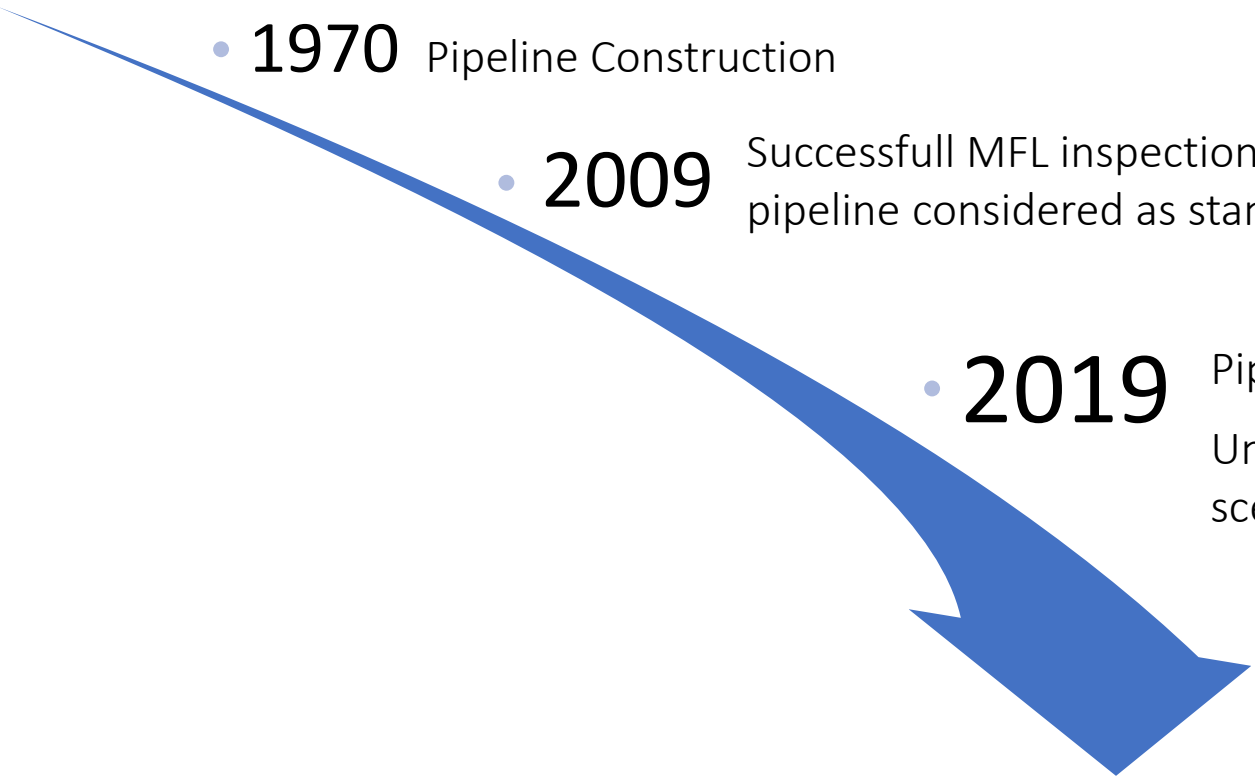
- ❑ Non-standard fittings in pipeline designs can create challenges for proper in-line inspection (ILI)
- ❑ Fitting with complicated internal geometry can usually not be negotiated by ILI tools and represents a challenging obstacle
- ❑ Fittings may unknown to pipeline operators due to the age of the pipeline and/or lack of documentation during their design and construction.
- ❑ Customized inspection tools will be required to safely negotiate such non-standard fitting and gather data from the entire pipeline length for their integrity management.

PIPELINE INFORMATION

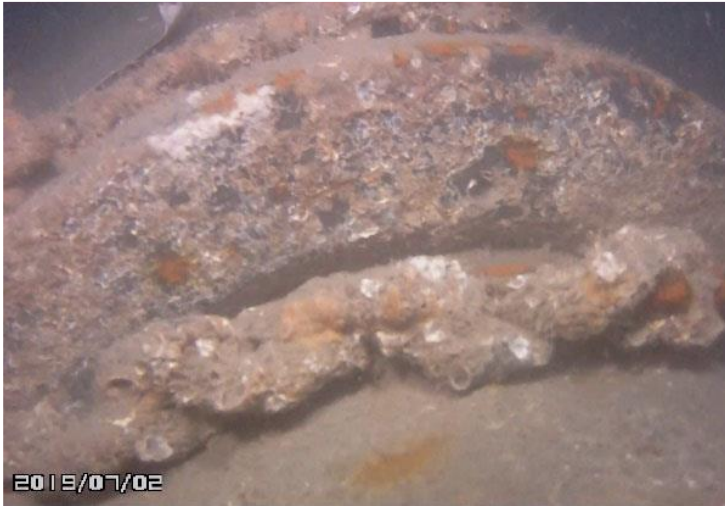
Location:	Gulf of Mexico
Field:	Offshore 2,035 square km 33 drilled wells three offshore platform four submarine pipelines 14 production wells produces 4,000 bopd and 17,000 mscfd of gas
Pipeline Data:	
Pipeline Diameter:	12"
Length:	32km
Min Bend Radius:	1.5D
Wall thickness:	12.7mm
Medium:	(Oil+Gas+Water) Multiphase
Launch:	Offshore Platform
Receive:	Onshore Battery
Inspection Technology:	MFL (Magnetic Flux Leakage)



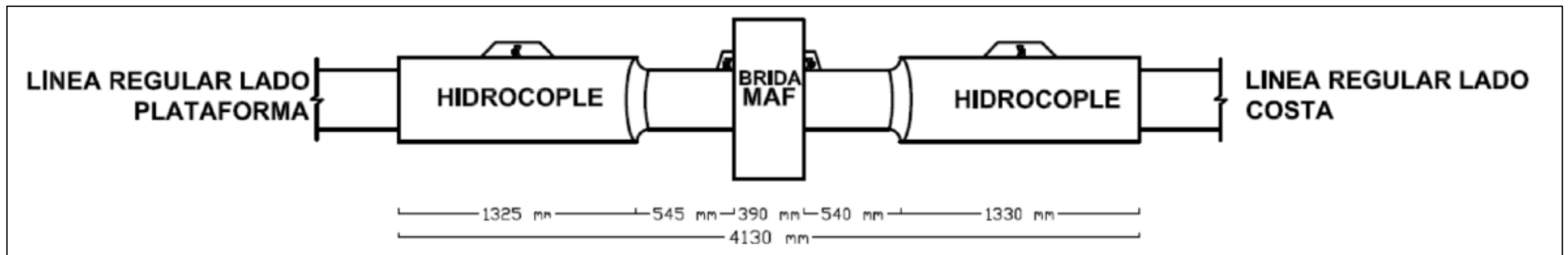
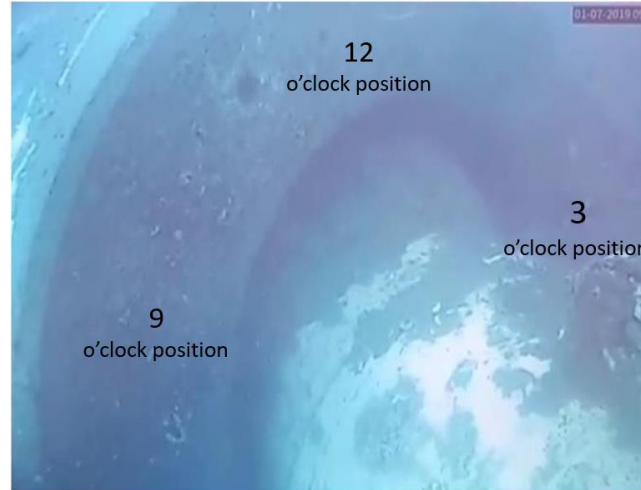
PIPELINE HISTORY

- 
- A large blue arrow pointing downwards and to the right, indicating the progression of time through the pipeline history.
- **1970** Pipeline Construction
 - **2009** Successful MFL inspection executed by another ILI vendor – pipeline considered as standard inspection
 - **2019** Pipeline transferred to new owner, current operator
Unsuccessful MFL Inspection by another ILI vendor – tool stuck scenario due to unknown installation
 - **2021** Next ILI planned

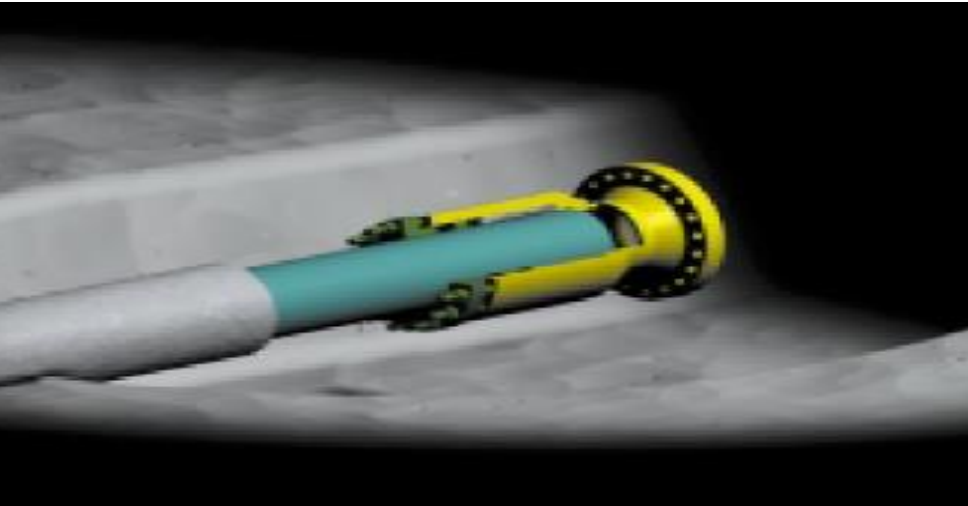
UNDERWATER PHOTOGRAPHY OF UNKNOWN INSTALLATION



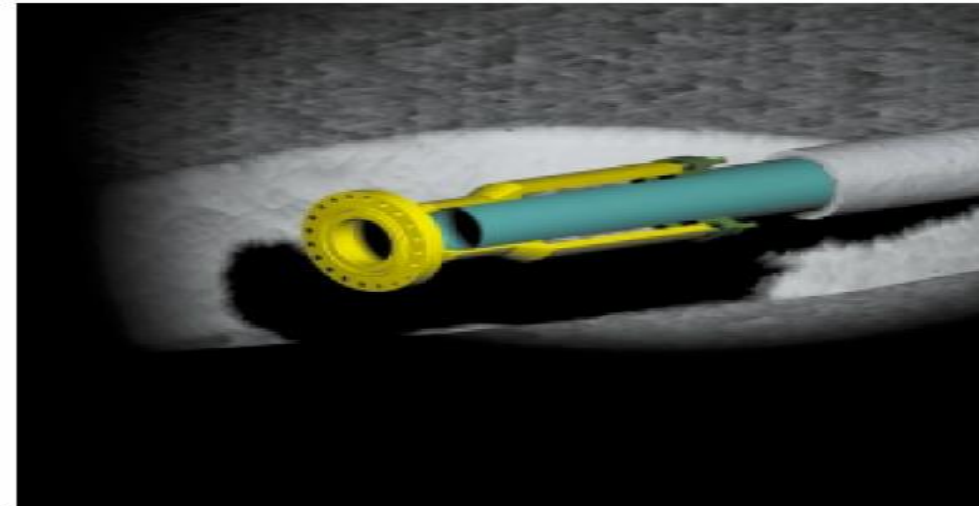
SUBSEA INSTALLATION OVERVIEW



PIPELINE AND SUBSEA INSTALLATION

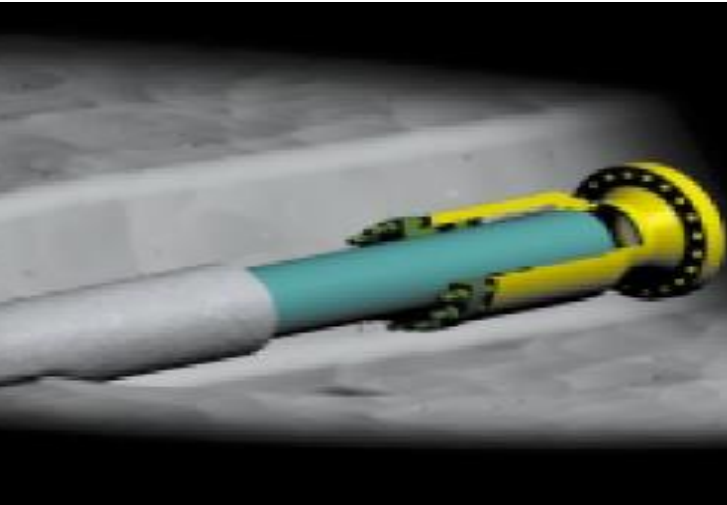


Pipeline End Connector (PEC)
“Hydrocouple”

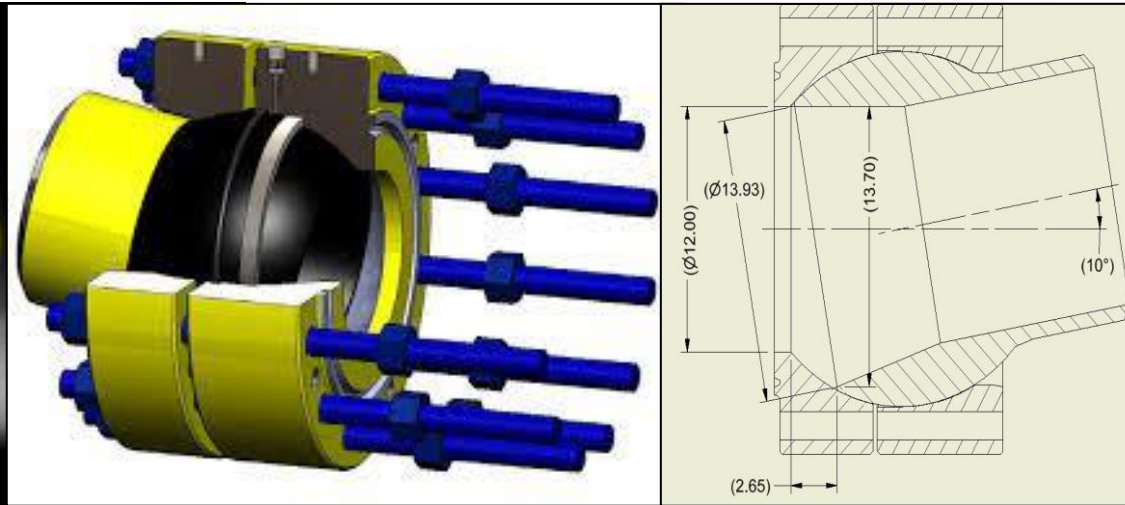


Pipeline End Connector (PEC)
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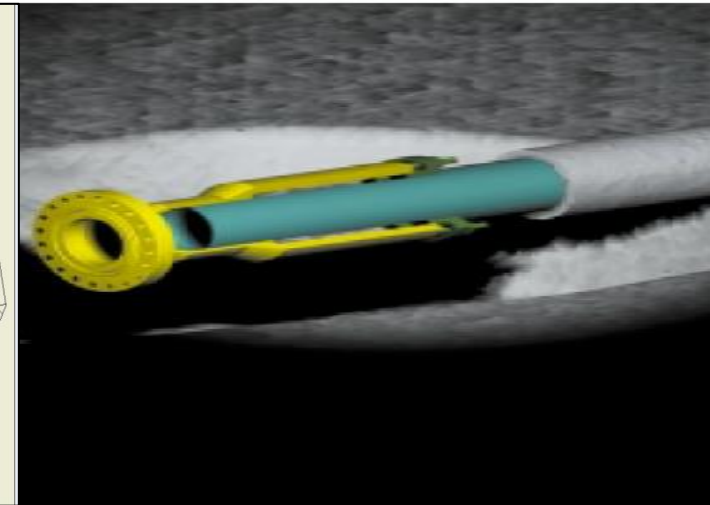
PIPELINE AND SUBSEA INSTALLATION



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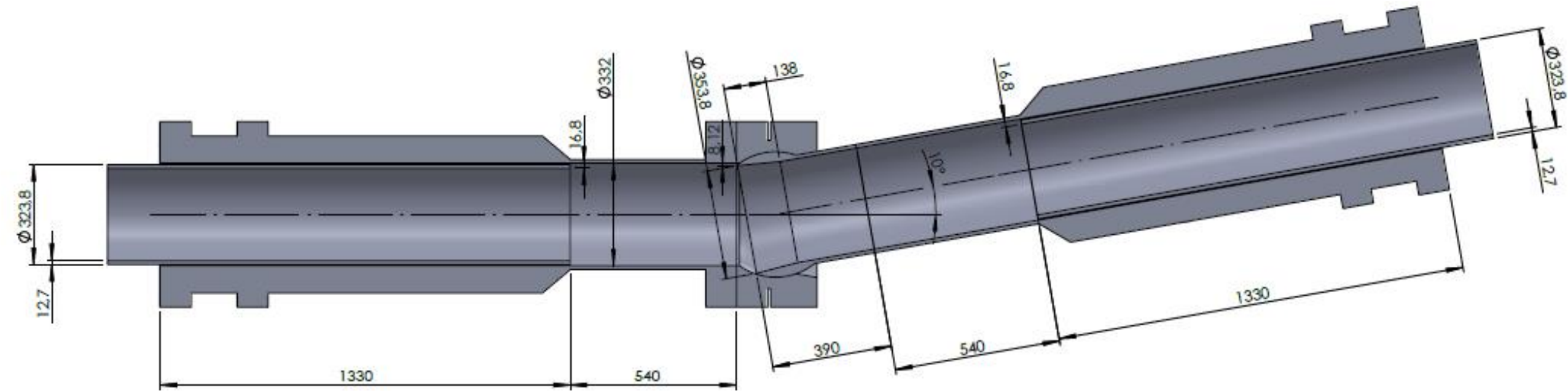


MisAligned Flange (MAF)

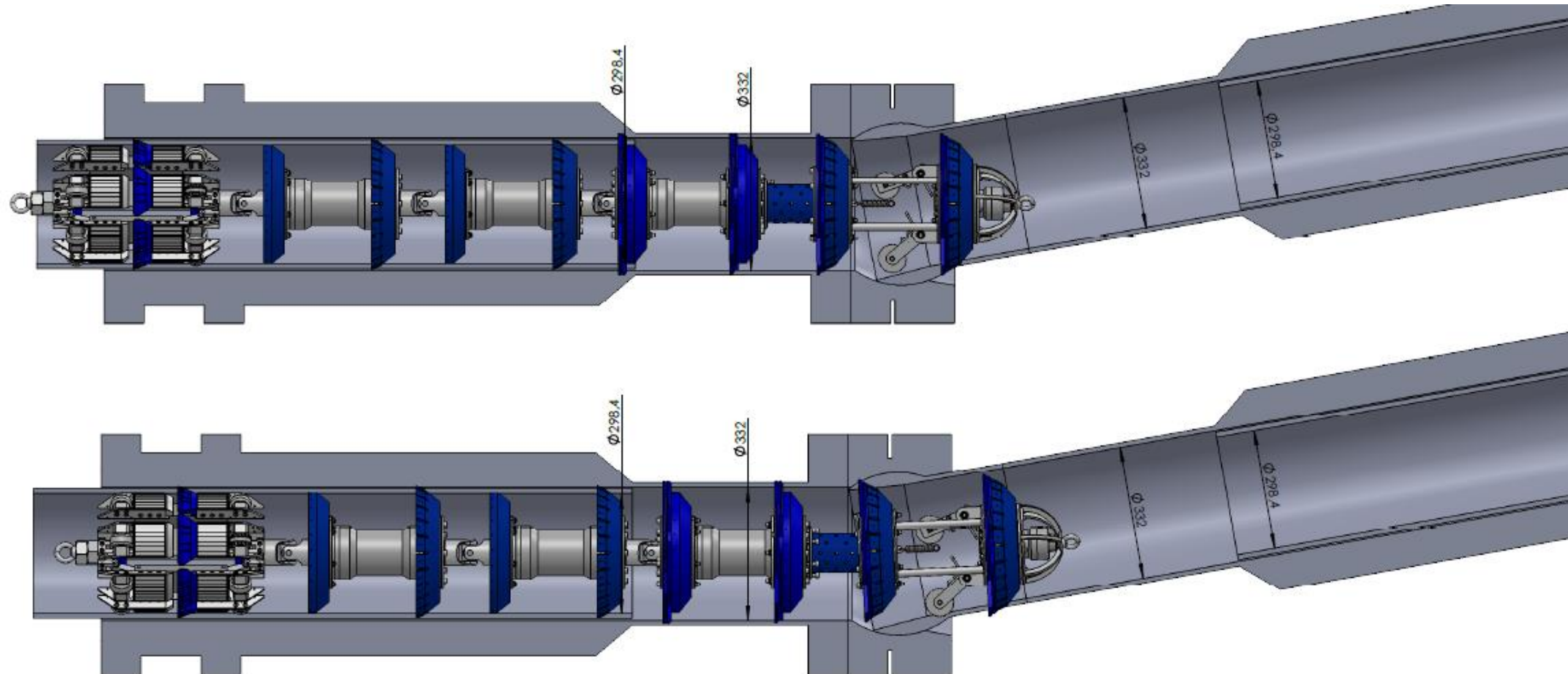


Pipeline End Connector (PEC)
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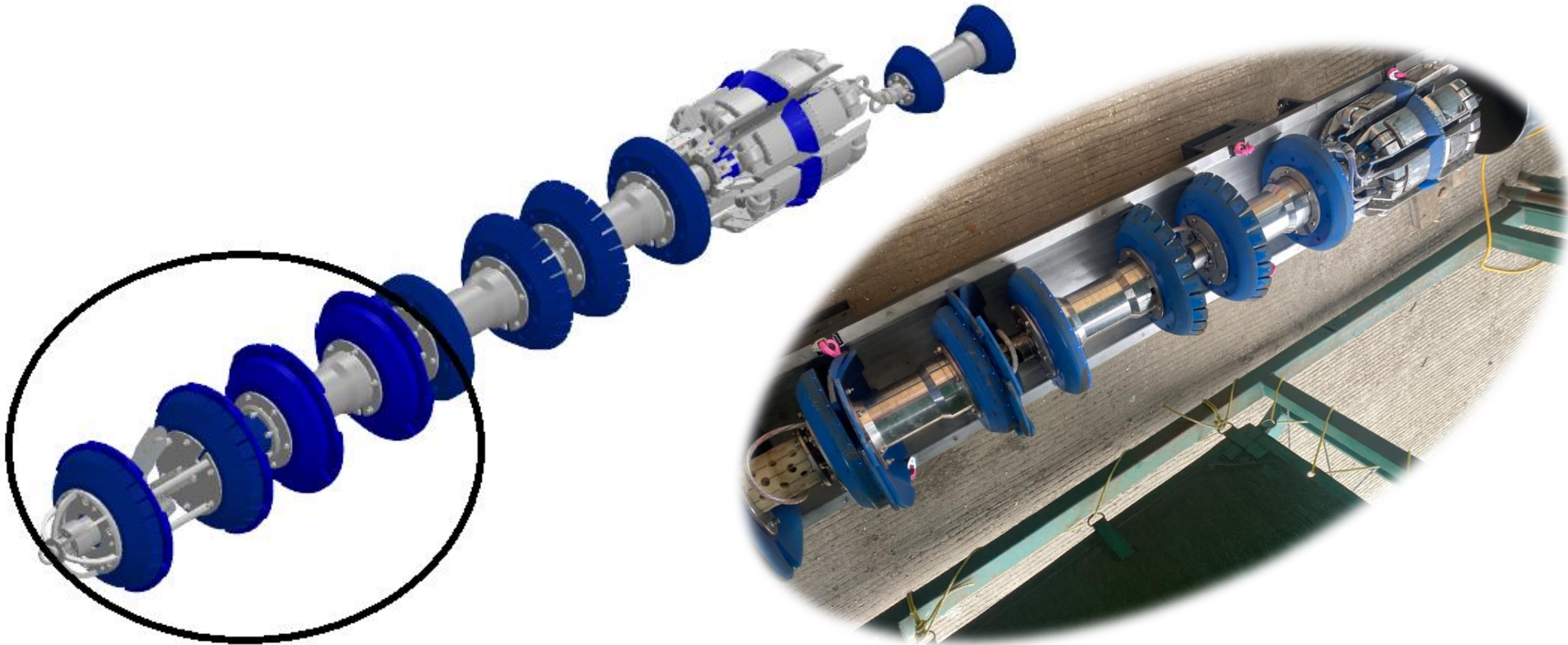
SKETCH OF SUBSEA INSTALLATION



DESIGN AND TOOL ASSEMBLY



DESIGN AND TOOL ASSEMBLY



INSPECTION EXPERIENCE / INSPECTION EXECUTION “DUMMY TOOL RUN”



INSPECTION EXPERIENCE / INSPECTION EXECUTION “MFL TOOL RUN”



MFL TOOL
BEFORE
LAUNCH

TOOL LAUNCH IN 4M³ LIQUID
BATCH TO OVERCOME 1.5D BEND

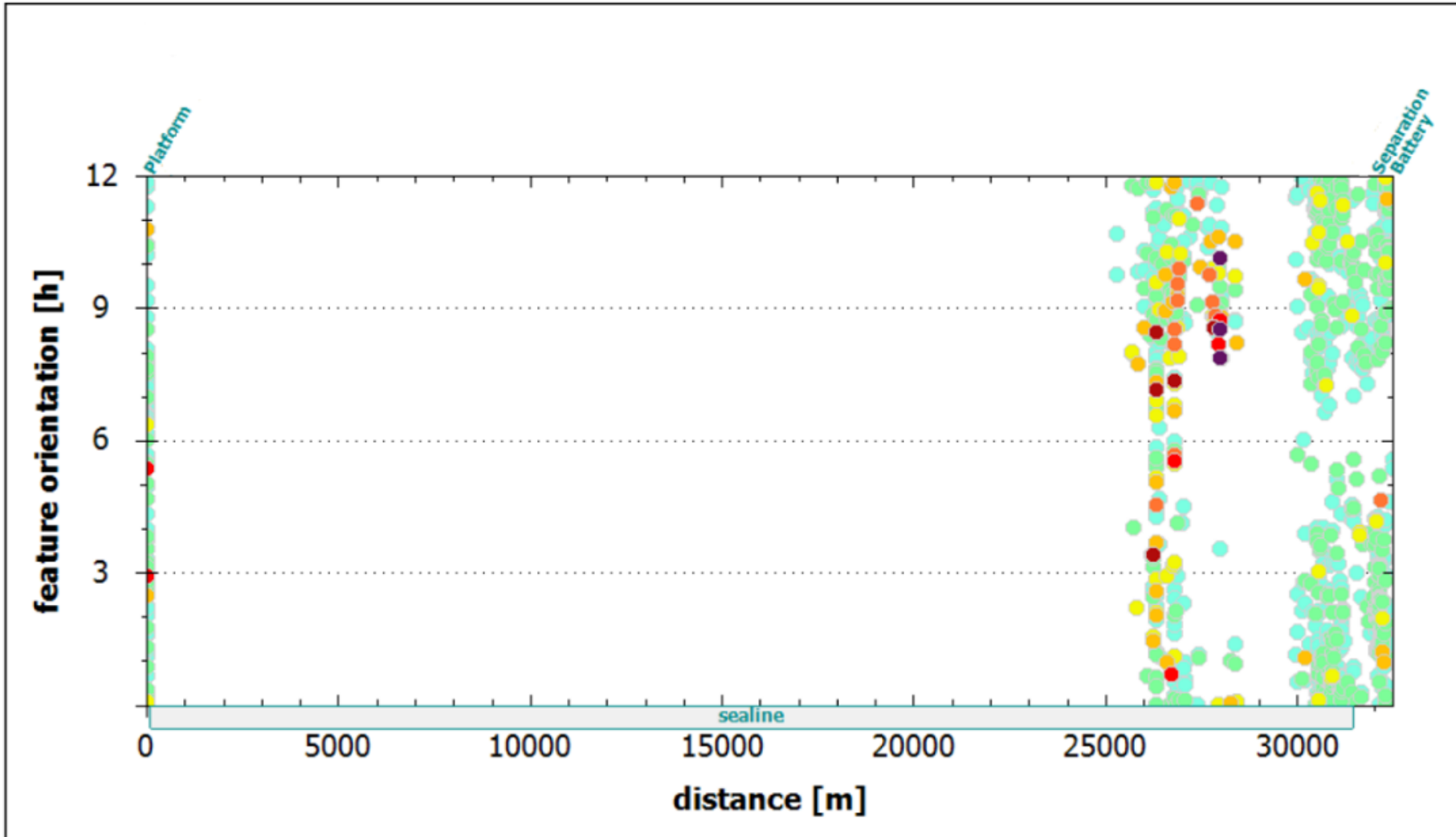
MULTIPHASE PRODUCT AS
PROPELLING MEDIUM

TOOL RECEIVED IN GOOD
CONDITION AND COMPLETE
DATA SET – SUCCESSFUL ILI RUN



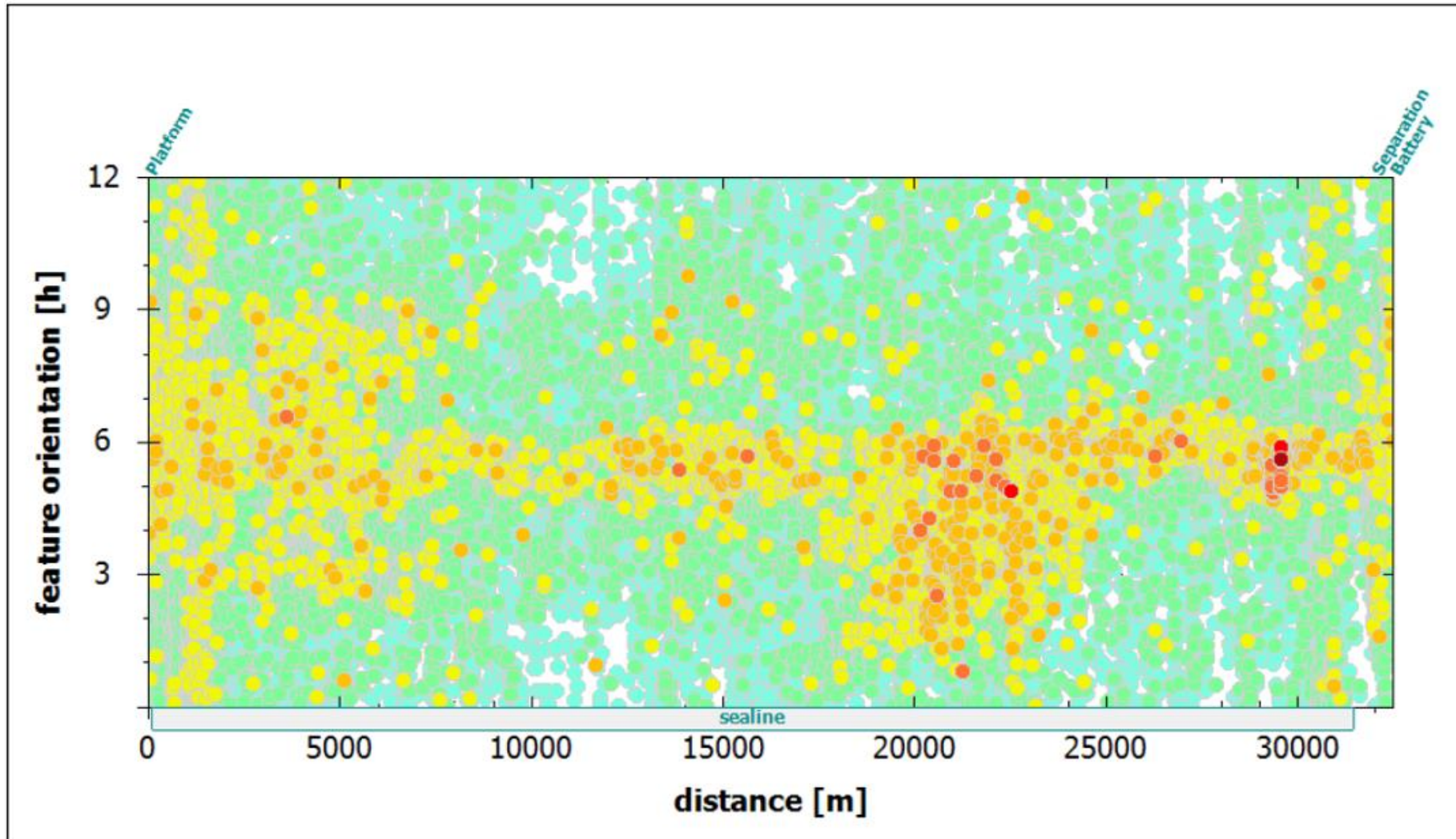
MFL TOOL
AFTER
RECEIVE

INSPECTION RESULTS



Distribution of external metal loss over the pipeline length and circumference

INSPECTION RESULTS



Distribution of internal metal loss over the pipeline length and circumference

CONCLUSION

Acquisition of new assets can be a challenge for pipeline operators, as in many cases former operators do not enclose every detail of their asset configuration, and often do not document the changes made to their assets.

Not knowing the design and configuration of a pipeline, its fittings and installations leads to navigating the unknown and unexpected.

Based on the investigative information provided by the client, 3P Services designed and assembled a customised intelligent MFL tool for this pipeline which allowed the particular internal geometry of these fittings to be negotiated in conjunction with the offshore pipeline characteristics and provided important information on the integrity of the full length of the pipeline. Due to the installation, this had not been possible during the in-line inspection in 2019. The close collaboration between 3P Services and the client led to the successful inspection of the pipeline.

Thank you for Joining this presentation!