



A Cost-effective Integrated  
Digital Twin for Subsea Field  
Development - Case Study



# SubseaXD

Lunch time Technical Meeting

Date : 12<sup>th</sup> May 2020

Time : 12.00 – 13.00

12:00 – Session Starts –House keeping

12:05 – Introduction by chair Hema Wadhwa, INTECSEA

12:10 – Presentation by **Subrata Bhowmik, McDermott**

12:40 – QA/Panel Discussion Pieter Swart, Shell

13:00 – Session Ends

**Registration : Free for members**

<https://12mayltm.eventbrite.com.au>

Outlook Calendar invite will be sent once registered in Eventbrite

# Subsea<sup>XD</sup> - A Cost-effective Integrated Digital Twin for Subsea Field Development - Case Study

Lunchtime Technical Meeting – 12<sup>th</sup> May 2020, 12:00 to 13:00

This case study presents a cost-effective, user-friendly and highly reliable subsea pipeline design automation framework under the cloud-based digital field twin platform Subsea<sup>XD</sup>. The pipeline FEED and detail design phases are normally quite long and need to run several analyses sequentially to achieve the desired results. A significant number of calculation hours are saved due to systematic and sequential approach with minimum remediation work by reducing human error. In this proposed design automation framework, all the standard pipeline calculations including code checks are performed through a web-based graphical user interface (GUI) designed in cloud-based digital field twin. Some more advanced level pipeline finite element analyses are also performed for buckling and walking assessment. Various calculations including wall thickness calculation based on API/DNV/ASME code check, on-bottom stability analysis, pipeline span analysis, pipeline end expansion analysis, out of straightness analysis and pipeline buckling analysis are performed sequentially and systematically in the cloud using the metadata information available from the digital field data and automated through the python API. This approach significantly reduces the total project cost. This kind of a cloud-based digital field twin is very much beneficial for the early stages of design where some changes are expected.

## Key Learning Outcome

Cost-effective, user-friendly and highly reliable subsea pipeline design automation framework under the cloud-based digital field twin platform called Subsea<sup>XD</sup>. An integrated system giving 3D digital field diagram as well as all pipeline design calculations in one digital platform connected through python-based API. Integrating all the pipeline design calculations and automated report generation in a cloud-based digital field twin is very much beneficial for the early stages where some changes are expected.