

# TECHNICAL NOTE: RE-CALIBRATION AND VALIDATION OF NORWEGIAN SUBSEA'S MRU MARINE SERIES

This note applies to the MRU Marine series and models no. 3000, 6000 and 9000.

The NORSUB MRU Marine calibration certificate is valid for 4 years, and full product specification is maintained in this period under normal operating conditions.

## Notes:

1. The specified heave accuracy of 5 cm / 5% is maintained over the MRU's lifetime, also without re-calibration.
2. Re-calibration and validation of the MRU every 4<sup>th</sup> year is recommended if the customer requires full product specification after expiration of a valid calibration certificate.
3. However, the specified accuracy in roll & pitch for a given model is usually met over the MRU's lifetime under normal operating conditions as Norwegian Subsea uses only validated sensors with exceptional stability.
4. The lifetime accuracy in roll & pitch, without re-calibration, will not exceed 0.1, 0.05 and 0.035 degrees for the 3000, 6000 and 9000 models, respectively, under normal operating conditions.
5. Thus, selecting a more accurate model than initially required may extend the calibration intervals or remove the need for re-calibration.
6. The computed MTBF (mean time between failure) for a NORSUB MRU Marine is 100 000 hours, but actual lifetime depends on use, vibrations, and temperature. An MRU lifetime of 10 years or more under normal continuous operation can be expected.