Roadmap for New P&A Technologies

Norsk olje&gass

Move scope from Rig to Rigless

	Wellbore Diagnostics	Access to establish barriers	Establish barriers	Verify barriers	Casing & Conductor removal
2021	Wireline to verify access - Further develop casing deformation models based on caliper data/sonic tools - Dual string logging - Slim (1-1,5'') digital calipers	Upwards milling CT Tubing /Casing erosion Further develop DP based cut and pull operations (Jack, Upwards milling, Perf and wash barite, Cut and pull assemblies) Remove casing in Dual string	Alternative to cement - Creeping shale - Activate formation - Material (steel, geopolymer, natural material)	Develop new use of existing WL tools for barrier verification (listening tool etc.)	Optimize tools and processes for casing / conductor removal - Mechanical, abrasive, explosive or laser cut offline - Retrieval with HLV/ jacking unit - offline - Leave to be pulled with jacket - Hydraulic pinning of conductor/csg
2023	Access to wellbore data without entering wellbore - Wellbore drone - Sound waves/acoustics based WBD	Pull tubing in open sea (LWI) Enhanced scale and debris milling/removal solutions High energy solutions (melt, burn & ablate) Ultra slim solutions to lift tubing to log/place barriers	Termite plug Alternative materials - chemical materials - new cement type (magnetic) Handle control line/ leave tubing with control lines in hole	Tracer gas Wireless sensor technology New WL tools for barrier verification	
2025 +	Wellbore diagnostics without entering wellbore - Sensors on WH to give SCP rate and source - Analytical fluid verification for offshore disposal	Enhanced electro chemical corrosion Further develop high energy solutions for optimized plugs / formation barriers	Full Subsea Rigless PP&A Use of umbilical to handle downhole tools and placement of barriers - rigless Placement of barrier plugs in dual casing Improve fluids challenge to solve intermix viscosity	Verification of dual casing barriers	