

# Augmented Controls Technology (ACT)



Proserv has been manufacturing control systems since 1976. In that time Proserv has gained considerable experience in subsea engineering and control system design. When Proserv acquired Weatherford Controls in 2012, which included Brisco Engineering, acquired by Weatherford in 2003, it further cemented over 35 years established experience in topside and subsea wellhead controls.

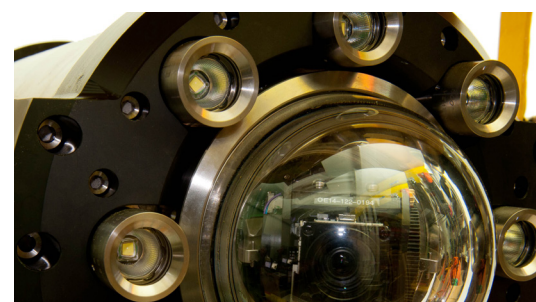
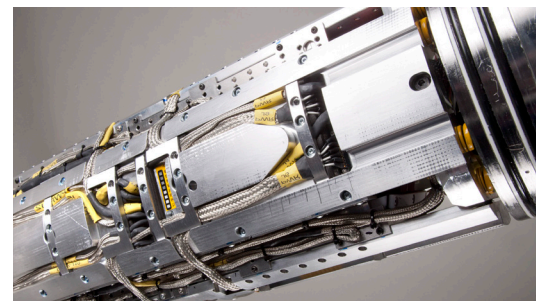
Proserv Augmented Controls Technology (ACT) is an approach we adopt that involves allowing additional control technologies to be deployed to augment an existing control system and open up a range of opportunities that were previously not available for the client.

Proserv's solutions can:

- Increase field life by overcoming obsolescence issues
- Improve production optimisation through additional instrumentation
- Improve uptime with greater reliability
- Improve production by adding wells onto aging fields

The technology provides our clients with a subsea controls solution for their brownfield assets where no viable solution is available.

While every application and solution is different, the technology developed creates clear commercial, operational and technical advantages for your aging subsea assets.



## Augmented Controls Technologies (ACT) Projects

Proserv has an established a track record for ACT projects delivered to clients globally. Below is a summary of recent projects completed to demonstrate our capability and expertise in this specialist field. Note: projects detailed undisclosed and without field / development reference are withheld at request of client.



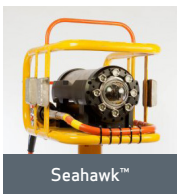
Award Winning Artemis 2G



SCM



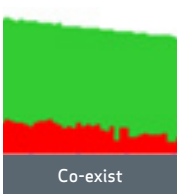
OCH



Seahawk™



OCC



Co-exist

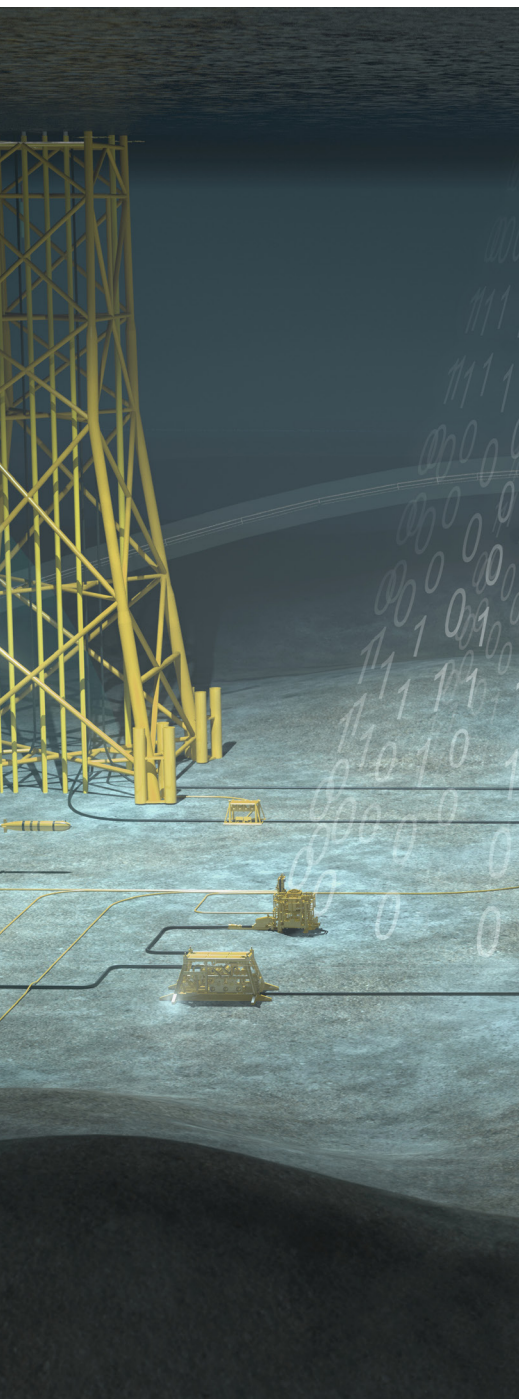


Retrofit

### The ACT toolkit

Year	Client	Work Scope	Location
2019	Undisclosed	ACT FEED co-exist / upgrade (Aker iCON 4G SCM)	Gulf of Mexico
2018	Apache	BUCKLAND - ACT co-exist/MCS/EPU Upgrade (Aker iCON / 3G SCM)	North Sea - UK Sector
2018	Taqa	OTTER - Subsea control pod for communication, monitoring and control of the OneSubsea multiphase pump using old infrastructure	North Sea - UK Sector
2018	Undisclosed	ACT co-exist / upgrade (Aker iCON 4G SCM)	Gulf of Mexico
2018	Undisclosed	ACT Co-Exist / FEED (Aker 3G / iCON SCM)	Gulf of Mexico
2018	Point Resources	BALDER - ACT co-exist / upgrade (GE SCM)	North Sea - Norwegian Sector
2018	Talos	BORIS - ACT co-exist / upgrade (GE 2k ModPod) including running tool dev / qualification	Gulf of Mexico
2017	Repsol	YME -ACT co-exist / upgrade (GE 2k ModPod)	West Africa
2017	Talos	TYPHOON - ACT co-exist / upgrade (GE 2k ModPod) including running tool dev / qualification	Gulf of Mexico
2017	Tullow Oil	JUBILEE - ACT FEED study (FMC 150 / 615 SCM)	West Africa
2016	Talos	TORNADO - OCH and EDU for multiphase metering	Gul of Mexico
2016	Undisclosed	ACT co-exist / upgrade evaluation (Aker 3G)	Australia
2016	Undisclosed	ACT co-exist / upgrade evaluation (GE 2k ModPod)	Australia
2016	Undisclosed	ACT FEED study (FMC KOS 150 SCM)	West Africa
2016	Rashid Petroleum Company	SCARAB/SAFFRON - ACT FEED study (Aker 3G SCM)	Egypt





Year	Client	Work Scope	Location
2016	Statoil	NJORD - future subsea upgrade, concept and FEED study	North Sea - Norwegian Sector
2016	Statoil	VISUND - refurbishment of an old Aker 4G SCM	North Sea - Norwegian Sector
2015	Statoil	TROLL C - SeaHawk™ subsea camera for leakage monitoring on export riser	North Sea - Norwegian Sector
2015	Anadarko Petroleum	CAESAR TONGA PHII - OCH for multiphase metering	
2014	Statoil	TROLL C - subsea video surveillance and electrical actuator, co-exist power and communication with Aker ICON SCMs	North Sea - Norwegian Sector
2014	Statoil	GULLFAKS A - subsea video surveillance, co-exist power and communication with FMC KOS 150 SCM	North Sea - Norwegian Sector
2015	Andarko Petroleum	TICONDEROGA - one compact OCH subsea module, co-exist with Aker SCM using same quads, for subsea multiphase metering	Gulf of Mexico
2013	Statoil	TROLL B - subsea control system upgrade FEED study	North Sea - Norwegian Sector
2013	CNR	TONI - surface MCS, subsea SCM/SCMMBs and OCHs - co-exist communication with Cameron system	Northern North Sea
2012	REPSOL	PLP - surface MCS, HPU, TUTU, subsea SDU/EDU, SCMs, SCMMBs, SAMs, OCHs	Central North Sea
2012	Shell	PRINCESS - provide (ATS and DTS system) communication from topside system to the subsea via power line communication co-exist with FMC KOS 150 modems.	Gulf of Mexico
2012	Andarko Petroleum	LUCIUS - OCG for multiphase metering	Gulf of Mexico
2011	Statoil	HEIDRUN - provide communication from topside system to the subsea via broadband DSL communication to an OCH	North Sea - Norwegian Sector
2011	Ithica Energy UK Ltd	ANGLIA - refurbishment of SCMs and MCS upgrade	Central North Sea



Year	Client	Work Scope	Location
2010	<b>Andarko Petroleum</b>	CAESAR TONGA - two OCH subsea modules and one MDHS multiphase metering and data handoff cabinet (MCS), co-exist with Aker SCM using same quads, for subsea multiphase metering	Gulf of Mexico
2009	<b>Perenco</b>	Upgrade EPU and SCM with SUTU and jumpers	Southern North Sea
2009	<b>Statoil</b>	KRISTIN - one SeaHawk™ subsea camera system including integration of power and communication from topside system to the subsea via broadband DSL communication direct to the subsea camera unit	North Sea - Norwegian Sector
2007	<b>Statoil</b>	VISUND - OCH DIACS IWIS option three for Visund with Roxar five gauge downhole solution and interfaced to topside system	North Sea - Norwegian Sector
2007	<b>Statoil</b>	TORDIS - OCH with fibre optic communication for AECM IOR Acoustic leak detection system / condition monitoring	North Sea - Norwegian Sector
2006	<b>Statoil</b>	ÅSGARD - SeaHawk™ subsea video surveillance for Mikkell template - developed a compact flexible subsea camera system under this pilot delivery	North Sea - Norwegian Sector