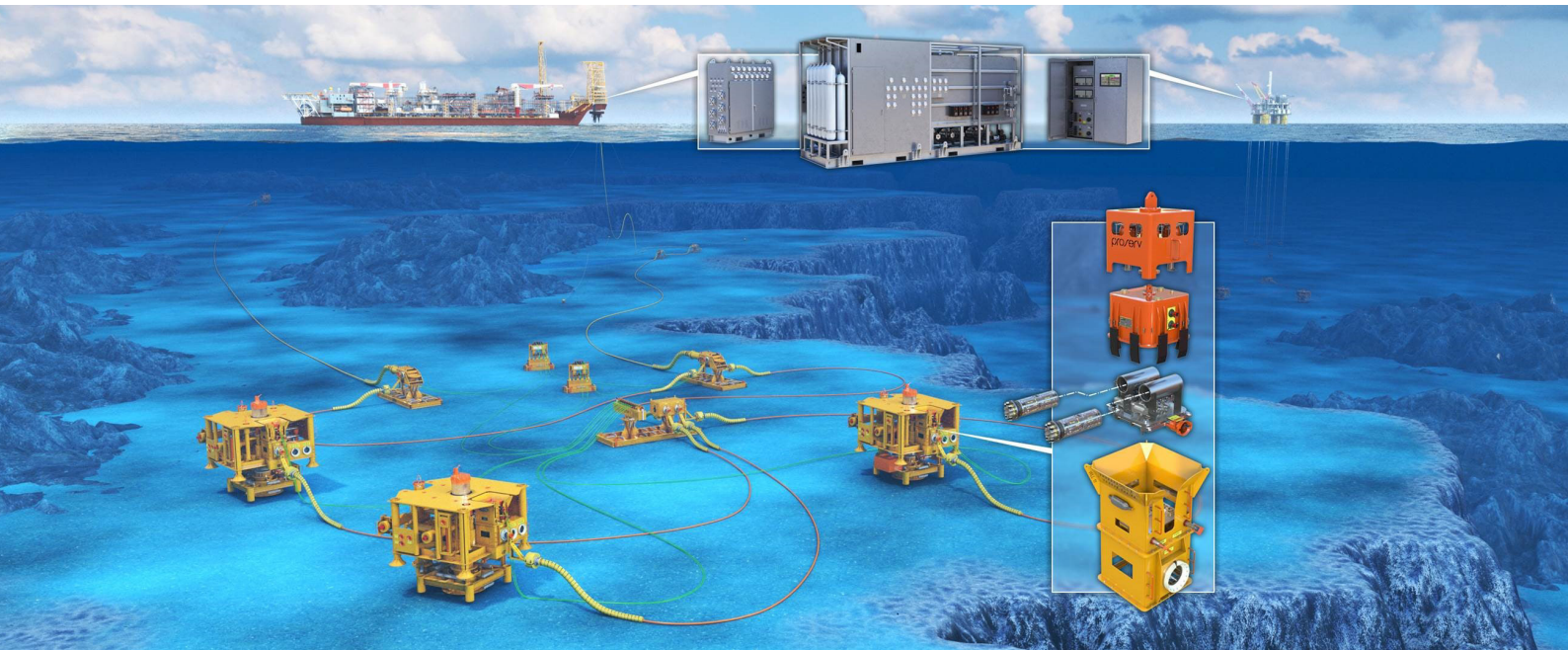


Augmented Controls Technology (ACT)



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.

56%
LESS GREENHOUSE
EMISSIONS*

A recent study* demonstrates that, by removing the need to conduct system overhauls, Proserv can reduce the emissions associated with the use of a subsea control module (SCM) by approximately **56%**, when compared to using an industry standard product. The primary source of greenhouse gas emissions savings is achieved through negating the requirement to retrieve and service the SCM during its lifespan. Eliminating the need for a support vessel to assist with the retrieval of the module saves approximately 78 tonnes CO₂e.



AUTOCON LTD.



A proven track record...

proserv



20,000

Production control systems
manufactured



200

Metering control systems
manufactured



6,000

Wellhead control systems
supplied



300

Subsea control
modules installed



40,000

Sampling cylinders
supplied



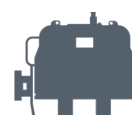
1,000

Production control systems
refurbishments



700

Monitoring, control
and retrieval projects



130

Subsea control
projects completed

Augmented Controls Technology (ACT)



Proserv has an established 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.

Year	Client	Work Scope	OEM	Product Type	Generation	QTY	Location
2026	Anadarko	MARCO POLO - OCHs		OCH		5	Gulf of Mexico
2025	Woodside Energy	SHENZI - ACT phase 8, Aker iCon SCM upgrades	Aker iCon	SCM		3	Gulf of Mexico
2025	Hess Corp.	CONGER - SCM ACT refurb/repair		SCM		1	Gulf of Mexico
2025	OKEA ASA	DRAUGEN ACT refurbishment of SCM		SCM		1	North Sea - Norwegian Sector
2025	Anadarko	WARRIOR - 3 x SEMs, 6 x SCM upgrades	Baker Hughes	SEM, SCM		6	Gulf of Mexico
2025	Anadarko	Central Master Control Station		MCS			Gulf of Mexico
2025	Talos	POMPANO - SCM		SCM		1	
2025	Trident	CEIBA - Proserv SCM compatible with existing SCMMB		SCM		1	Equatorial New Guinea
2025	Total Energies	GULFAKS - SCM upgrade	Technip FMC	SCM	KOS150		North Sea - Norwegian Sector
2024	OKEA ASA	DRAUGEN - Spare SEM for the Aker SCM	Aker	SEM			North Sea - Norwegian Sector
2024	Prometim	GIRASSOL - KOS150 SCM pilot project, SEM upgrade, phase 2	KOS	SCM	KOS150		Angola
2024	Trident	EAST ENCHOVA - MacManifold retrieval procedure and refurb.	Brisco			1	Brazil
2024	Total Energies	GIRASSOL - GIR Flying leads replacement		Flying leads			Angola

Augmented Controls Technology (ACT)



Year	Client	Work Scope	OEM	Product Type	Generation	QTY	Location
2024	Trident	OKUME - SCM test stand refurb / upgrade	Legasea	SCM			Equitorial New Guinea
2024	Woodside Energy	SHENZI - ACT phase 7, 5 Aker iCon SCM upgrades	Aker iCon	SCM		5	Gulf of Mexico
2024	Woodside Energy	SHENZI - ACT phase 6, Aker iCon SCM upgrades	Aker iCon	SCM			Gulf of Mexico
2023	Total Energies	FORVIE - ACT full hydraulic refurb of Dril-Quip hybrid SCM and integration of Proserv A2G SEMs.	Dril-Quip	SCM			North Sea - UK Sector
2023	Repsol	YME - SCM upgrade	Proserv	SCM		1	North Sea - Norwegian Sector
2023	Aker BP ASA	SKARV SeaHawk™ system refurbishment		SeaHawk™			North Sea - Norwegian Sector
2023	Total E&P Angola	GIRASSOL KOS 150 SEM evaluation, and modulation and protocol solution	KOS	SEM	KOS150		Angola
2023	Oxy	WARRIOR BHGE co-exist modpod upgrade	Baker Hughes				Gulf of Mexico
2023	CNR	THELMA - KOS 100 SCM ACT refurbishment	KOS	SCM	KOS100		North Sea - UK Sector
2022	Repsol	YME BETA NORTH - SCM modification		SCM			North Sea - Norwegian Sector
2022	Hess	CONGER - 4 x Aker SCM upgrades, HPU modification and MCS	Aker iCon	SCM, HPU, MCS			Gulf of Mexico
2022	Oxy	LUCIUS - co-exist OCH (SMIM)		OCH			Gulf of Mexico
2022	Talos	POMPANO - Phase 2 co-exist / SCM upgrade BHGE Semstar 5 / SEM3 ABB Seathec SCMs	Baker Hughes	SCM, SEM			Gulf of Mexico

Augmented Controls Technology (ACT)

Year	Client	Work Scope	OEM	Product Type	Generation	QTY	Location
2021	Equinor	GULLFAKS - SPCS pilot restart, Topside upgrade/integration and overhaul of 1 x TMFC KOS150 SCM	Technip FMC	SCM	KOS150	1	North Sea - Norwegian Sector
2021	Talos	POMPANO - Tool refurb, onshore test, 3 x SCM upgrade on prod wells		SCM		3	Gulf of Mexico
2021	BHP	SHENZI - Phase 5 co-exist / SCM upgrade Aker 4G iCon SCMs	Aker iCon	SCM			Gulf of Mexico
2021	Total	FORVIE - Jura SCM refurbishment	Dril-Quip	SCM	Jura	1	North Sea -UK Sector
2021	Total	DARLIA - Mini Subsea Distribution Unit		Mini SDU			Angola
2021	CNR	HURRICANE - ICV control box, manufacture of a new ICV control box		ICV control box		1	North Sea - UK Sector
2021	CNR	TONI - ACT upgrade (OSS Gen 1)		SCM			North Sea - UK Sector
2021	CNR	T BLOCK - Conversion of the CIW SCM05 to the Artemis 2	CIW	SCM		1	North Sea-UK Sector
2021	OKEA AS	DRAUGEN - SPCS pilot refurb SCMs		SCM		2	North Sea - Norwegian Sector
2020	Ithaca Energy	Phase 2 - HURRICANE ICV control box and mounting base	GE	ICV control box, mounting base			North Sea - UK Sector
2020	Oxy	LUCIUS - co-exist SeaHawk™ camera		SeaHawk™			Gulf of Mexico
2020	BHP	SHENZI - Phase 4 co-exist / SCM upgrade Aker 4G iCon SCMs	Aker iCon	SCM			Gulf of Mexico
2020	Medco	HIU - ACT refurbished SCMs co-exist solution.		SCM			Indonesia
2020	Trident Energy	5 hydraulic valve control modules and test stand		Hydraulic valve control modules		5	West Africa

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Year	Client	Work Scope	OEM	Product Type	Generation	QTY	Location
2020	OKEA	DRAUGEN - SCM overhaul and topside integration	Aker	SCM			North Sea - Norwegian Sector
2019	BHP	SHENZI - Phase 3 co-exist / SCM upgrade Aker 4G iCon SCMs	Aker iCon	SCM			Gulf of Mexico
2019	CNR Int.	CAMERON Iron Works SCM		SCM			North Sea - UK Sector
2018	Apache	BUCKLAND - ACT co-exist/MCS/EPU upgrade (Aker iCON / 3G SCM)	Aker iCon	MCS, EPU			North Sea - UK Sector
2018	Taqa	OTTER - Subsea control pod for communication, monitoring and control of the OneSubsea multiphase pump using old infrastructure	OneSubsea				North Sea - UK Sector
2018	BHP	SHENZI - Phase 2 co-exist / SCM upgrade Aker 4G iCon SCMs	Aker iCon	SCM			Gulf of Mexico
2018	Point Resources	BALDER - ACT co-exist / upgrade (GE SCM)	GE	SCM			North Sea - Norwegian Sector
2017	Repsol	YME - ACT co-exist / upgrade (GE 2k ModPod)	GE				North Sea - Norwegian Sector
2017	Talos	TYPHOON AND BORIS - Six retrofit SCMs A2G SEMs co-exist / upgrade on GE 2k ModPod complete with new running tools and test stand	GE				Gulf of Mexico
2016	Equinor	SLEIPNER VEST - VAN open power and communication hub supporting ClampOn erosion monitoring installed on a TFMC flow-module	Technip FMC	OCH			North Sea - Norwegian Sector
2016	Equinor	VISUND - refurbish the used Aker 4G SCM module by installing a Proserv A2G SEM with redundant power and communication. Reuse all hydraulic parts and sensors, replace only where necessary. Interface to topside Siemens DCS by legacy Modbus map.	Aker	SCM, SEM			North Sea - Norwegian Sector

Augmented Controls Technology (ACT)

Year	Client	Work Scope	OEM	Product Type	Generation	QTY	Location
2015	Equinor	TROLL C - SeaHawk™ subsea camera for leakage monitoring on export riser		SeaHawk™			North Sea - Norwegian Sector
2014	Equinor	TROLL C - subsea video surveillance and electrical actuator, co-exist power and communication with Aker iCon SCM.	Aker				North Sea - Norwegian Sector
2014	Equinor	GULLFAKS A - subsea video surveillance, co-exist power and communication with FMC KOS 150 SCM.	FMC		KOS150		North Sea - Norwegian Sector
2015	Oxy	TICONDEROGA - one compact OCH subsea module, co-exist with Aker SCM using same quads, for subsea multiphase metering (not installed)	Aker	OCH			Gulf of Mexico
2013	CNR	TONI - surface MCS, subsea SCM/SCMMBs and OCHs - co-exist communication with Cameron system	Cameron	MCS, SCM, OCH			North Sea - UK Sector
2012	Oxy	LUCIUS - OCH and topside cabinet for multiphase metering		OCH			Gulf of Mexico
2012	Shell	PRINCESS - OCH retrofit communications from topside system to subsea via power line communication co-exist with FMC KOS 150 modems.		OCH			Gulf of Mexico
2011	Equinor	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		SCM, MCS			North Sea - UK Sector
2010	Oxy	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	Aker	OCH		2	Gulf of Mexico
2009	Perenco	Upgrade EPU and SCM with SUTU and jumpers		EPU, SCM, SUTU			North Sea - UK Sector

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Year	Client	Work Scope	OEM	Product Type	Generation	QTY	Location
2009	Equinor	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		SeaHawk™			North Sea - Norwegian Sector
2007	Equinor	VISUND – OCH DIACS IWIS option three for Visund with Roxar five gauge downhole solution and interfaced to topside system		OCH			North Sea - Norwegian Sector
2007	Equinor	TORDIS – OCH with fibre optic communication for AECM IOR Acoustic leak detection system / condition monitoring		OSC			North Sea - Norwegian Sector
2006	Equinor	ÅSGARD – SeaHawk™ subsea video surveillance for Mikkell template - developed a compact flexible subsea camera system under this pilot delivery		SeaHawk™			North Sea - Norwegian Sector
2001	Amerada Hess	ANGUS - SCM upgrade and MCS hardware and software changes		SCM, MCS			North Sea - UK Sector

List of Abbreviations

ATS array temperature sensing
 CMIV chemical metering injection valve
 DSL digital subscriber line
 DTS distributed temperature sensing
 EDU electrical distribution unit
 EPU electrical power unit
 FEED front end engineering design
 FPSO floating production storage and offloading
 HPU hydraulic power unit
 IWIS intelligent well interface standardisation
 LER local equipment room
 MCS master control station
 MPFM multiphase flow meter

OCH open communications hub
 ROV remote operated vehicle
 SDU subsea distribution unit
 SAM subsea accumulator module
 SCM subsea control module
 SCMMB subsea control module mounting base
 SMIM subsea meter interface module
 SSIV subsea isolation valve
 STFL steel tube flying lead
 SUTU subsea umbilical termination unit
 TPCU topside power communication unit
 TUTU topside umbilical termination unit

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