

Dry Dock & Retrofit Service
of Valve Remote control System





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Why KSB Seil

30 years of experience

TRAINING

Engineers with proven
Standard Procedure

Certified Engineer

Who knows your VRCS and
understands how it works with
interlocked instruments
and systems

Pre- Check List

Tool to be prepared
for your Specific VRCS

Why not overhaul your Valve Remote Control System during Dry Docking?

Dry Docking is the best timing for proactive maintenance not only for those under SOLAS regulation but also for all other critical systems such as VRCS. That's why many shipping companies overhaul VRCS during dry dock service.

Your vessel is sum of various systems such as cargo systems, ballast systems and ODME systems. VRCS is a system interlocked with those systems where remote controls are required. Proactive maintenance of VRCS can improve your confidence in operation, increase productivity and save operational cost and unnecessary maintenance hours.

Your vessel's VRCS is specially designed and installed to maximize the operational efficiency of your specific vessel. It requires that specific information and related technical knowledge to overhaul your VRCS properly.

With 30 years of experience, KSB Seil has technical expertise of knowing exactly what your VRCS is and understanding how it works with related instruments and systems such as Valves and AMS. Pre-check list evaluated with minimum 8 years of experience provides best-fit-for purpose scope of service.

Do not miss the chance to check your submerged parts of VRCS.

KSB Seil VRCS Dry Dock & Retrofit Service includes

- » VRCS overhaul and repair
- » VRCS retrofits
- » Valve overhaul and retrofits



Dry Dock Service Scope for VRC



1 Complete health check of the System

■ Electric section

Tests functions of components

- Control Console
- Interface Panel
- Power Pack Panel

■ Hydraulic section

Checks internal/external leakage and status of hydraulic oil and tests performances of the section

- Hydraulic Power Pack
- Functional hydraulic block
- Actuator

2 Calibration and Performance improvement

- FIMM
- Position Indicator (PI)
- Direction Indication
- Current loop

3 Repairing

Replace consumables, repair components and fix problems

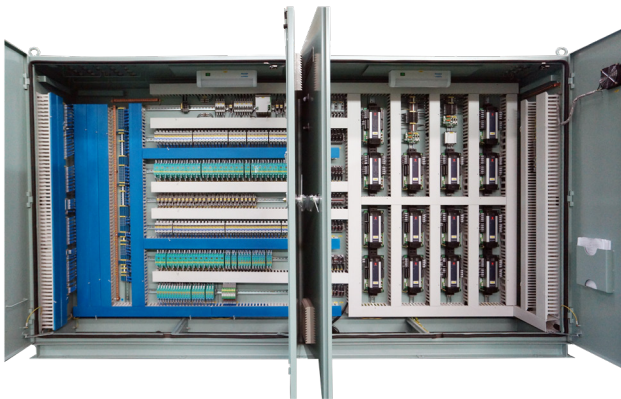
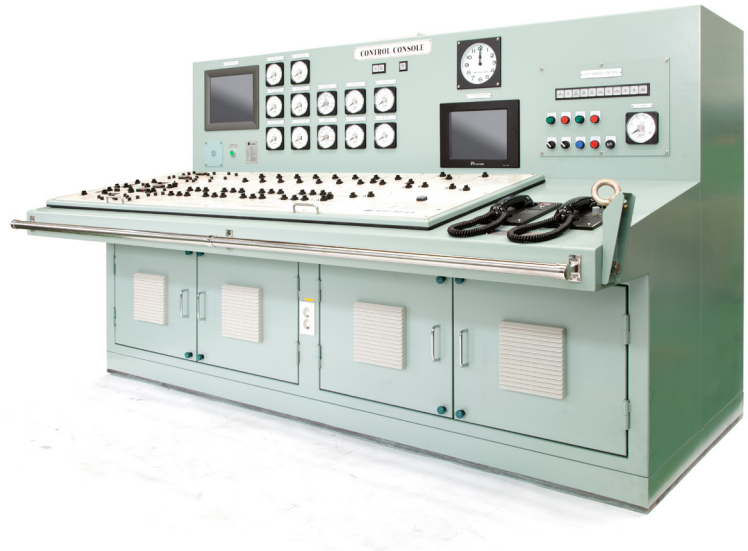
4 Crew Training

- Basic Maintenance skill
- List of regular check points
- Functions of each components
- How to operate

Work process for each components

Control Consol or Automation System Panel (KSB Seil Product)

- ☑ Checks integrity of all aspects including ;
 - Mimic Panel
 - Switches
 - Indicator lamps and feedback
- ☑ Calibrates Bar Graphs



Interface Panel

- ☑ Checks integrity of all aspects including ;
 - Barrier Panel
 - RI Convertors
 - Power supplier

Solenoid Valve Rack and Cabinets

- ☑ Checks integrity of all aspects in solenoid valve rack
- ☑ Calibrates flowmeters and position indicators
- ☑ Adjusts closing time of the valves



Dry Dock Work process for each components

Hydraulic Power Pack and Control Cabinet

- ☑ Checks setting pressures of components at **hydraulic power unit(HPU)** manifold including ;
 - Start Pumps
 - Stop Pumps
 - Standby Pumps
- ☑ Checks integrity of the **control cabinet** including ;
 - Relays
 - Alarms
- ☑ Checks integrity of **Accumulators** including ;
 - Bladder
 - Pressure



Actuator

» Actuator

- ☑ Inspects conditions
- ☑ Maintains actuators for critical valves such as mater and overboard valves
- ☑ Replaces consumables such as various seals
- ☑ Adjusts stroke if required

» Switch Box

- ☑ Checks its integrity
- ☑ Adjusts switches and potentiometers

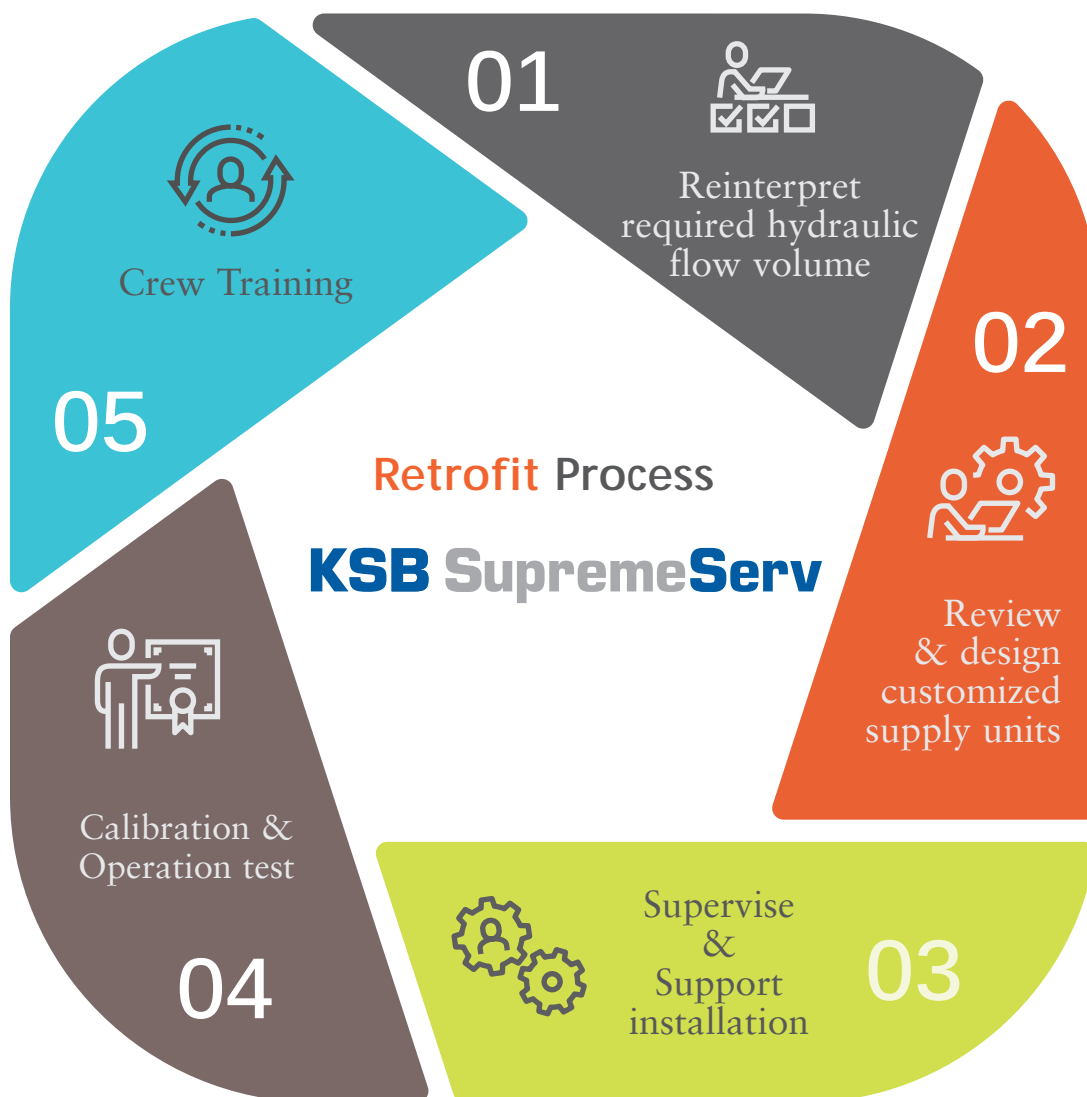


Retrofits of VRC

Regulatory requirements and changing market demands requires shiptype conversions, modifications and new equipment or system installations and some of those activities involves retrofits of your valve remote control systems. KSB retains design and engineering documents of all VRCs delivered and referring it for your vessel's retrofit service.

Retrofits for

- Ship conversions (e.g LNGC to FLNG or COT to PC)
- LNGC regasficiaton system retrofits
- LNGC anti-surge system retrofits
- Ballast Water Treatment System(BWTS) retrofits
- Cargo line modifications
- Partial upgrades requiring adding valve control points, etc.



Dry Dock Inspection Service

Reference list (2016 ~)

YEAR	VESSEL NAME	VESSEL TYPE	SHIP OWNER	LOCATION
2016	FRONT BRAGE	COT	ITM	France
2016	EXCELERATE	LNG	Excelerate Energy LP	Dubai
2016	CYGNUS PASSAGE	LNG	NYK	Japan
2016	CALLIOPE P	BULK	Marine Trust	China
2016	EJNAN	LNG	NYK	Qatar,NKOM
2016	SEA PONTA DA MADEIRA	BULK	PAN OCEAN	China
2016	PAN KRISTINE	BULK	PAN OCEAN	China
2016	STENA SUPERIOR	COT	Northern Marine Management	Singapore
2017	ANDROMEDA	PC	TSAKOS	Bulgaria
2017	AEGEAS	PC	TSAKOS	Bulgaria
2017	BYZANTION	PC	TSAKOS	Bulgaria
2017	AL THUMAMA	LNG	NYK	Qatar,NKOM
2017	AL SAHLA	LNG	NYK	Qatar,NKOM
2017	BOSPOROS	PC	TSAKOS	Bulgaria
2018	ALMI EXPLORER	COT	ALMI	Singapore
2018	EXCELLENCE	LNG	Excelerate Energy LP	Dubai
2018	GASLOG SANTIAGO	LNG	GASLOG	Singapore
2018	GASLOG SYDNEY	LNG	GASLOG	Singapore
2018	FLAGSHIP TULIP	PC	PRIME	China
2018	AL UTOURIYA	LNG	NYK	Qatar, NKOM
2018	COOL VOYAGER	LNG	THENAMARIS	Singapore
2018	SERI BIJAKSANA	LNG	MISC	Malaysia
2018	GASLOG SKAGEN	LNG	GASLOG	Singapore
2018	PERTAMINA GAS 1	LPG	PERTAMINA	Indonesia
2018	PERTAMINA GAS 2	LPG	PERTAMINA	Indonesia
2018	CORCOVADA	LNG	TMS-CARDIFF	Spain
2018	TANGGUH FOJA	LNG	K-LINE	Singapore
2018	EXPRESS	LNG	Excelerate Energy LP	Dubai
2018	SERI BALQIS	LNG	MISC	Malaysia
2019	STI DUCHESSA	PC	SCORPIO	China
2019	STI OPERA	PC	SCORPIO	China
2019	KITA LNG	LNG	TMS-CARDIFF	Singapore
2019	PALU LNG	LNG	TMS-CARDIFF	Singapore

Dry Dock Inspection Service

Reference list (2016 ~)

YEAR	VESSEL NAME	VESSEL TYPE	SHIP OWNER	LOCATION
2019	COOL RUNNER	LNG	THENAMARIS	Spain
2019	YARI LNG	LNG	TMS-CARDIFF	Spain
2019	TANGGUH PALUNG	LNG	K-LINE	Singapore
2019	OAK EXPRESS	PC	DOUBLE BRIGHT SHIPPING	China
2019	MALIBU	COT	CARDIFF	France To Russia
2019	MAERSK ERIN	PC	MAERSK	TURKEY
2019	FOUR COAL	BULK	VSHIPS	CHINA
2019	MAERSK EDGAR	PC	MAERSK	TURKEY
2019	STAR AUDREY	BULK	AUGUSTEA TECHNOSERVICES	CHINA
2019	SCF PRIMORYE	COT	TUZLA	TURKEY
2019	COOL EXPLORER	LNG	THENAMARIS	SPAIN
2020	GOLAR IGLOO	LNG	GOLAR	DUBAI
2020	EXPLORER	LNG		DUBAI
2021	EXPRESS	LNG	Excelerate	DUBAI
2021	AL DEEBEL	LNG	Mol	QATAR
2021	STENA CLEAR SKY	LNG	NORTHERN MARINE	FRANCE
2021	ALKIVIADIS		HYUNDAI GS	TURKEY
2021	ATLANTAS2		HYUNDAI GS	TURKEY
2021	CESI GALDSTONE	LNG	CHINA ENERGY SHIP MANAGEMENT	CHINA
2021	CESI QINGDAO	LNG	CHINA ENERGY SHIP MANAGEMENT	CHINA
2021	EXQUISITE	LNG	Excelerate	QATAR
2021	KMARIN RIGOUR		Synergy Maritime Pvt. Ltd	TURKEY
2021	SEAWYAS CANAVERAL	CFT	HYUNDAI GS	TURKEY
2021	EJNAN	LNG	NYK	QATAR
2021	BUSANSTAR	BULK	DUSUNG	KOREA
2021	SEAWAYS CANAVERAL	COT	HYUNDAI GS	TURKEY
2021	EXPRESS	LNG	HYUNDAI GS	TURKEY



Technology that **makes its mark**

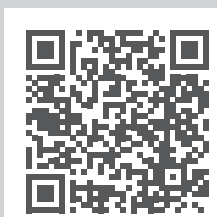
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