Base Load Power Hub (BLPH)

SITE ACCEPTANCE TEST PROCEDURE
WATER TREATMENT PACKAGE (A-50000)

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5 km off the coast of the Netherlands near the town of Egmond aan Zee.

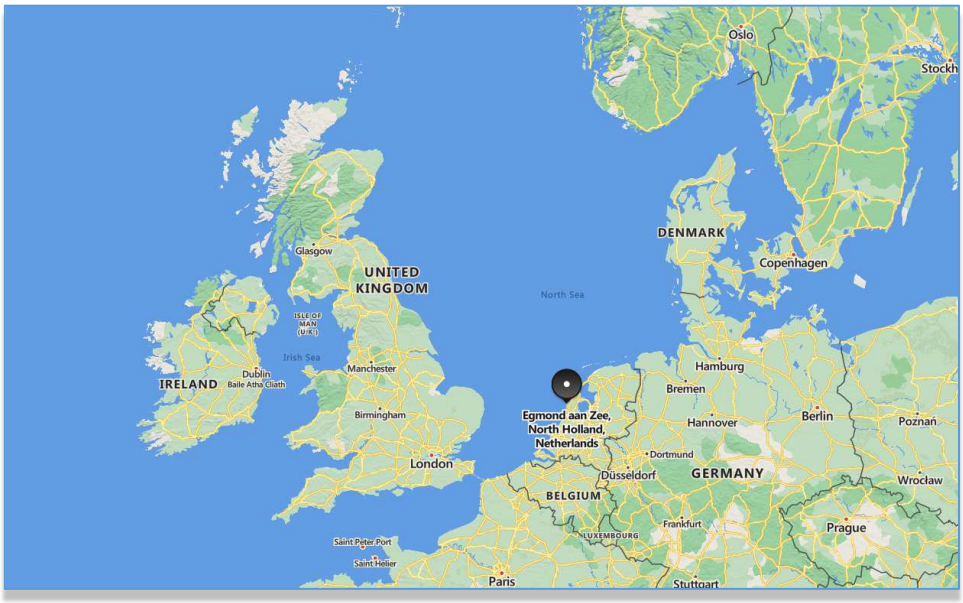


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

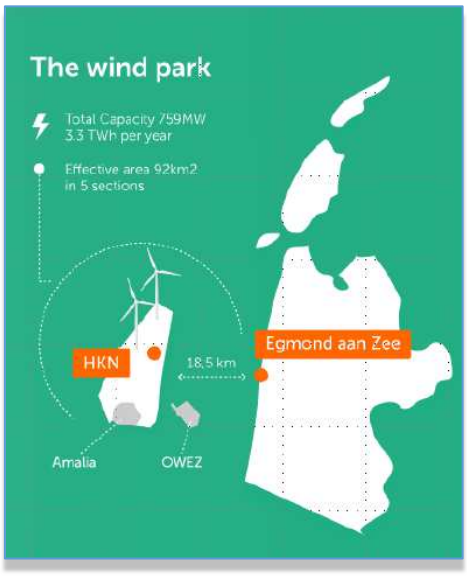


Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

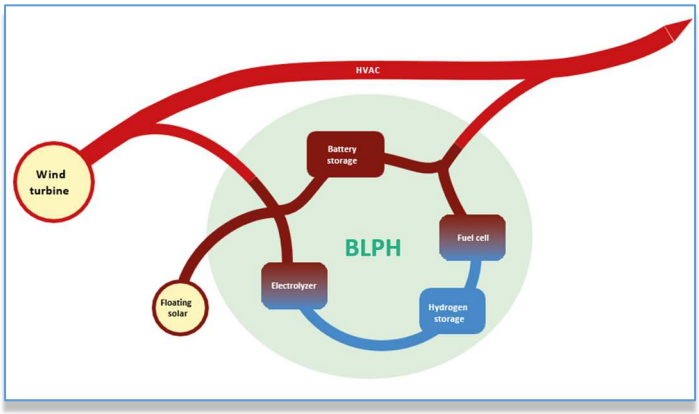


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting

wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

2 DOCUMENT PURPOSE AND SCOPE

The purpose of this document is to define the procedure of the functional test to be held at Rosetti Marino's yard (Marina di Ravenna) of the Water Treatment Package built by PSC Engineering & Contracting for the Hollandsee Kust Noord Wind Park Project.

The Site Acceptance Test is verified by multidisciplinary engineers to check the following aspects:

- Compliance of the installed equipment with all client's project specification and with PSC's documentations.
- Operation and functionality of entire Water Treatment Package.
- Check of the contractual parameters at the outlet of the Water Treatment Package, please refer to paragraph 5.6 of this document.

2.1 REFERENCES

Last revision of the following document as minimum shall be used as reference to perform the SAT test:

Doc. No.	Description
1724000448-PR-PID-00013	P&ID
1724000448-MAC-DA-00005	GENERAL ARRANGEMENT DRAWINGS
1724000448-MAC-MAN-00032	OPERATION & MAINTENANCE MANUAL
1724000448-IN-LIS-00021	INSTRUMENT LIST
1724000448-MAC-SP-00003	SYSTEM FUNCTIONAL DESCRIPTION
	As built technical drawings (electrical, mechanical & process schemes)
MSDS Antiscalant MSDS Non oxidant biocide MSDS Caustic soda	EVERBLUE 600 - Everblue EB BIOCIDE PLUS - Everblue Caustic soda 6 mol/l - Merck

Table 1 - Reference Documents

2.2 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY)	Crosswind
CONTRACTOR (CTR)	ROSETTI MARINO S.p.A.
PROJECT	HOLLANDSE KUST NOORD WIND PARK Project
CA	Certification Agency
DCS	Distributed Control System
DS	Surveyor
EXP	Expediting dept.
LOG	Logistic Dept.
NDE	Non Destructive Examination
NTU	Nephelometric Turbidity Unit
PLC	Programmable Logic Controller
PQR	Procedure Qualification Record
QC	Quality Control Dept.
QCI	Quality Control Inspector
SC	PSC Engineering S.p.A.
SWRO	Sea Water Reverse Osmosis
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TSS	Total Suspended Solids
UPS	Uninterruptible Power Supply
WI	Welding Inspector
WLD	Welding Dept.
WQR	Welder Qualification Record
WPS	Welding Procedure Specification

Table 2 - Definitions and Abbreviations

2.3 RESPONSIBILITIES

Good construction safety practices must be in place and followed all times during site acceptance test to reduce possibility of injury.

PSC shall not be liable for physical injury, damage or delays caused by a failure to observe the instruction contained in the operating and installation manuals.

PSC will conduct the site acceptance test with client Rosetti Marino as witness and based on the following procedure.

All commissioning teams and maintenance staff shall be available to attend the present test.

All portable instruments and common mechanical and electrical tools shall be available on site and provided by Client.

3 TEST UTILITIES AND CHEMICALS

The following utilities and chemicals will be available at yard during the Water Treatment Package Functional Test:

3.1 ELECTRIC POWER

The following Electric Energy supply will be made available by Rosetti Marino to feed the Water Treatment Plant:

- 2 kW – 230V / 50Hz
- 65 kW – 400V / 50Hz

Cables, cable glands and switch as required to connect and power up the package.

3.2 COMPRESSED AIR

A compressed dried and filtered air pipeline, from workshop internal air distribution system, will be made available by Rosetti Marino only for cleaning and drying purposes.

3.3 SERVICE WATER

Cleaned service water at 3-5 barg, from workshop internal water distribution system, will be made available by Rosetti Marino for cleaning and flushing purposes.

3.4 SEA WATER

Sea water, supplied by Rosetti Marino, will have the following inlet characteristics:

COMPOSITION	CONCENTRATION (mg/l)
Sodium, Na	11150
Potassium, K	420
Calcium, Ca	432
Magnesium, Mg	1410
Barium, Ba	0.1
Strontium, Sr	6.6
Chloride, Cl	20310
Sulphate, SO_4	2800
Bicarbonate, HCO_3	150

TDS	36682
Silica, Si	1
Iron, Fe	<0.02
Manganese, Mn	<0.01
Oil	<0.1
TSS	<10
TOC	<10
Temperature	10-23°C

Table 3 – Sea water composition

Before starting the Site Acceptance Test at yard it is mandatory to reach the above parameters, or at least: TSS, Oil, Iron, Silica, Calcium, Magnesium, TOC, Turbidity < 10 NTU, temperature.

Please note that the laboratory analysis of the samples are out of PSC scope and will be performed by Rosetti Marino.

3.5 CHEMICALS

The partial first filling of chemicals will be provided by PSC to allow the dosing pumps operation and test:

Biocide: 10 kg

Antiscalant: 10 kg

NaOH solution: due to the variable value of the pH of the sea water at the package inlet, the solution with the proper Caustic soda concentration shall be prepared according to the following table:

Sea water pH	Caustic soda concentration	Caustic soda available at 20%	Demi water	Dosing pump flowrate
8.2	2%	1 liter	10.8 liters	0.04 l/h
7.8	5%	1 liter	3.5 liters	0.04 l/h

Table 4 – Caustic soda dosage

Please contact PSC SpA for sea water pH evaluation and caustic soda concentration value in case the detected sea water pH values turn out to be different from those indicated in the above table

4 EQUIPMENTS

The following equipment and machinery will be available at yard during the test:

4.1 FEEDING PUMP

Sea water will be supplied by Rosetti Marino at inlet battery limit at constant flow rate 2.5 m^3/h and at feed pressure up to 4 barg – 5 barg max by N.1 package feed pump.

Inlet/outlet flexible pipes, valves and dedicated feed incoming powers will be available by Rosetti Marino.

4.2 TERMINAL POINTS

Flexible pipes to be provided by Rosetti Marino:

4.2.1 Hydraulic Terminal Points

TERMINAL POINT	NPS	FINISH	RATING	FACE	MATERIAL	DESCRIPTION
TP-017	1 ½"	FLG	150#	RF	PVC	Sea water from intake pumps
TP-002	1"	FLG	150#	RF	PVC	Fresh water
TP-003	3"	FLG	150#	RF	PVC	Sea water drain
TP-005	1"	FLG	150#	RF	PP	Biocide to sea water intake
TP-006	1"	FLG	150#	RF	PP	Biocide to wastewater tank
TP-007	1 ½"	FLG	150#	RF	PVC	Chemical drain
TP-008	½"	FLG	150#	RF	PVC	Container open drain

4.2.2 Sampling Points

Intermediate sampling points have been provided inside container suitable to get specimen for analysis in case water characteristics do not cope with expected results, in order to find the origin of the fault:

SAMPLING POINT NUMBER	SAMPLING POINT VALVE	DESCRIPTION
1	MV-501 ½"	Sea water inlet
2	MV-510 ½"	Filtered sea water downstream S-50001
3	MV-644 ½"	SWRO permeate
4	MV-572 ½"	Fresh water outlet

Please note that the laboratory analysis of the samples is out of PSC scope and will be performed by Rosetti Marino.

4.2.3 Electrical Terminal Points

TERMINAL POINT	DESCRIPTION
Terminal strips	For Main power feeding, analog, digital, motors
Junction Box 1	Panel Feeding 400 V, 50 Hz
Junction Box 2	UPS Feeding 230 V, 50Hz
Communication Card	Signals from/to ICCS
Communication Card	Signals from/to Fire & Gas Panel

5 TEST PROCEDURE

5.1 PRE-REQUIREMENT AND BASIC INSTRUCTION

The purchaser shall comply with the instructions and information given in this document, and all personnel associated with the equipment of this plant shall be made familiar with the information contained herein.

All people involved in the erection, tests, start-up and service of the plant should be fully qualified, skilled and totally informed about the correct service and the relevant hazard, fluids and raw materials of plant.

Installation, pre-commissioning and commissioning activities shall be successfully carried out, before starting any test described in the present procedure.

All relevant defects, failures and damages shall be listed and recorded during pre-commissioning and commissioning to be agreed and resolved by action plan, especially for the critical part or component required to the start-up and plant operation.

Documents and Manuals supplied by the equipment manufacturers may supplement and complete the information given in this procedure.

The working space required for the execution of the tests shall be accessible and not be used for storage but shall be clean and free of debris. Any tools or test instruments must not be left unattended.

Before and during test executions, all safety requirements shall be strictly followed and suitable PPE used.

5.2 TEST SEQUENCE

Completed the commissioning and start-up periods, the plant shall be started and operated within design parameters as per PSC's operation manual and relevant sub-vendor's manuals.

The sea water will feed the plant as per Section 3.4.

All required utilities shall be always supplied as per Section 3.

Check that the plant is controlled automatically.

All stand-by items (pumps, fans, heater, SWRO etc.) will be checked in operation.

The package start-up will follow the normal procedure.

The following subsystem has been already tested during the pre-commissioning and commissioning activities.

- Self cleaning coarse filter A-50003 operation and backwash
- Operation of electric heater H-50001
- Sand filter S-50001 operation and backwash
- SWRO system operation A-50007A/B
- SWRO system flushing
- Fresh water pumps P-50009A/B
- Softening filter S-50004 operation and regeneration
- Biocide dosing
- Antiscalant dosing
- NaOH dosing
- Automatic draining systems

Please refer to SAT REPORT - ATTACHMENT A – EQUIPMENT and SAT REPORT - ATTACHMENT C – SEQUENCES for the acceptance criteria

The scope of the SAT test is to verify that the freshwater parameters reported at the paragraph 5.6 are met.

The water treatment package A-50000 is equipped with nr.4 sample points.

Sample point nr.1 shall be used to verify the chemical characteristic of the feed water

Sample point nr.2 is used to verify the water quality after the sand filter filtration

Sample point nr. 3 is used to verify the RO water quality

Sample point nr. 4 shall be used to verify the freshwater parameters reported at paragraph 5.6

It is suggested to sample the water every 4 hours during the system operation.

The samplings shall be marked at least with sample point nr. (as for the table shown at paragraph 4.2.2) and with the time of sampling.

It is suggested that all the 4 samples taken will be analyzed each time to have constant monitoring of all the main water chemical characteristics at the inlet and after the treatment points. However, if that is not possible it is strictly necessary to analyze at least sampling nr.1 e nr.4 (water parameters at the system inlet and outlet)

It is also important to record the parameters reported by the instruments installed in the package. The parameters must be reported using the tables (process data and contractual data) in the annexes to this document. At the end of the day, final tables will then be filled in showing the average of the values obtained in the three daily inspections as the measured values.

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5.3 DURATION

Test duration will be 4 consecutive days for 12 hours/day switching on line A to Line B every 12 h

5.4 TEST PARAMETERS

The following parameters will be monitored and recorded during the test:

- Pressure, Temperature, Level and Flow as per package instruments
- Filtered sea water conductivity (50-AT-023)
- SWRO outlet fresh water conductivity (50-AT-024)
- Fresh water outlet pH (50-AT-027)
- Fresh water outlet total hardness (50-AT-026)

5.5 ACCEPTANCE CRITERIA

The Site Acceptance Test will be successfully passed according to the following acceptance criteria:

- Water Treatment Package shall be started and operated continuously and in steady conditions with the following requirements:
  - a) No visible damage, deformation, hydraulic leakage and corrosion for main components (piping, valves, pumps, tanks, filter, SWRO, pressure vessel, softener, electric heater, UV sterilizer, instrument)
  - b) No interruption in production
  - c) Absence of malfunction and failure (mechanical, electrical)
  - d) No visual alarm or fault
  - e) No excessive vibrations
  - f) No overheating of the power equipment (electrical heaters, motors, local panels, local control and power panels)
  - g) Reliable instrument measurement (calibration and within operating measurement range), checking by portable instruments where they are available
  - h) Correct automatic sequence as per system description and operation of the automatic valves (no valve misalignment)
  - i) Correct interlocks activation as per C&E
  - j) All measured values and equipment status are monitored properly and recorded by the local control panel
  - k) Operating parameters shall be within design values
  - l) All set points values shall be as per instrument list and can be adjustable
  - m) Checking all transmission signals to/from DCS.

- Other requirements to be successfully tested:

a) Correct start-up sequence of the plant (especially the high pressurization step of the HP Pressure Pumps)

b) Normal shutdown sequence of the plant

c) Emergency shutdown of the plant, power failure and fire gas failure

d) F&G detection system by positive simulation.

5.6 SYSTEM PERFORMANCE GUARANTEES

Fresh water quality shall be as per Spec. K559-2254-PM-PLN-003, par. 8.3.2.

• SWRO permeate flow rate	:	0.8 m^3/h	50-FT-026
• SWRO permeate conductivity	:	703 µS/cm	50-AT-024
• SWRO permeate hardness	:	0.9 °F	50-AT-026
• pH	:	7-7.9	50-AT-027
• Temperature	:	10-23	50-TT-024

The Test will be considered successful if the above acceptance criteria are met and the quality of fresh water and its flow rate meet the contractual guarantees. Immediately after a test report shall be signed by the parties.

6 CLEANING

At the end of the test the package will be emptied and rinsed with fresh water to remove all the seawater inside equipment and pipes.

Where possible the pipes will be cleaned and dried with compressed air.

Chemicals will be removed from their storage tanks, tanks and pumps will be cleaned, rinsed with fresh water and dried with compressed air. The chemicals solution will be correctly disposed.

7 TEST REPORT

A Site Acceptance Test Report will be issued after test, complete with all following reference documentation:

7.1 PHOTO REPORTAGE

A photo reportage will be done at site, including the following sections:

- Photo of external view of container with relevant installation, hydraulic and electrical connection
- Photo of internal view of the container with all installed equipment
- Photo of Video page HMI, with all operating process parameters of the tested items and operating SWRO line A and SWRO Line B
- Photo of any displayed alarm and failure
- Photo of Seawater, Permeate water and Freshwater samples.

7.2 TECHNICAL ATTACHMENTS

The following attachment shall be filled and signed by PSC's staff and Client:

- SAT REPORT - ATTACHMENT A – EQUIPMENT
- SAT REPORT - ATTACHMENT B - PROCESS PARAMETERS

Process parameters to be reported for the three reading prior to declaring the mean value

- SAT REPORT - ATTACHMENT C - SEQUENCES
- Laboratory analysis certificated of the water samples.

Once the test will be completed, a Site Acceptance Test certification shall be signed by Customer within 48 hours from successful test.

In case of fail of the Site Acceptance Test, the first step is to identify which parameter does not comply with requirements. Then, check the correct operation and calibration of instruments.

Finally, if the instruments work properly, through sampling points listed in Section 4.2.2., water analysis will be taken and values recorded to identify where the issue occurs.

PARAMETER	CONTRACTUAL VALUE	WATER SAMPLE
SWRO permeate conductivity	703 µS/cm	Sea water inlet, SWRO permeate (to check salt rejection of membranes), Fresh water outlet
Fresh water hardness	0.9 °F	Sea water inlet, SWRO permeate (to check membranes rejection of Ca and Mg), Fresh water outlet (to check operation of Softener)
pH	7-7.9	Sea water inlet, SWRO permeate (to check rejection of membranes and check the set dosage of caustic soda), Fresh water outlet (to check dosage of caustic soda)

In case of fail of the Site Acceptance Test, PSC will submit a dedicated report with actions to identify and resolve any deficiency, failure.

The test will be rescheduled after revision and implementation applied to the tested plant.

8 REFERENCE LIST

8.1 MODBUS LIST

For complete information please refer to document number: 1724000448-IN-LIS-00019

	ROSETTI MARINO	PSC	
	DOCUMENT TITLE: PERFORMANCE TEST	**Doc. No.:** PK2885-Q-005	
	DOCUMENT No: 1724000448-QC-PRO-00028		**Page: 1 of 6**
ATTACHMENT: 05	**Modbus List**		

FIELD TAG/DEVICE	SERVICE	ICSS I/O TYPE	FORMAT	MODBUS REGISTER	REGISTER BIT
50-AT-020A	H2 gas detection in container	SAI	FLOATING	40001	-
50-AT-020B	H2 gas detection in container	SAI	FLOATING	40003	-
50-AT-020C	H2 gas detection in container	SAI	FLOATING	40005	-
50-AT-023	Filtered seawater conductivity to P-50003A/B	SAI	FLOATING	40007	-
50-AT-024	Fresh water conductivity from A-50007A/B	SAI	FLOATING	40009	-
50-AT-026	Fresh water outlet total hardness	SAI	FLOATING	40011	-
50-AT-027	Fresh water outlet pH	SAI	FLOATING	40013	-
50-FT-020	Seawater flow to S-50001	SAI	FLOATING	40015	-
50-FT-022	Filtered seawater flow from P-50003A	SAI	FLOATING	40019	-
50-FT-023	Filtered seawater flow from P-50003B	SAI	FLOATING	40021	-
50-FT-024	Fresh water flow from A-50007A/B	SAI	FLOATING	40023	-
50-FT-026	Fresh water outlet flow	SAI	FLOATING	40017	-
50-LT-020	T-50006 level	SAI	FLOATING	40025	-
50-LT-021	T-50008 level	SAI	FLOATING	40027	-
50-LT-022	T-50002 level	SAI	FLOATING	40029	-
50-LT-023	T-50003 level	SAI	FLOATING	40031	-
50-LT-024	T-50004 level	SAI	FLOATING	40033	-
50-PDT-023	dP across S-50001	SAI	FLOATING	40035	-
50-PT-020	Seawater inlet pressure	SAI	FLOATING	40037	-

FIELD TAG/DEVICE	SERVICE	ICSS I/O TYPE	FORMAT	MODBUS REGISTER	REGISTER BIT
50-PT-025	Filtered seawater pressure from P-50003A	SAI	FLOATING	40039	-
50-PT-026	Filtered seawater pressure to P-50004A	SAI	FLOATING	40041	-
50-PT-027	Filtered seawater pressure from P-50003B	SAI	FLOATING	40043	-
50-PT-028	Filtered seawater pressure to P-50004B	SAI	FLOATING	40045	-
50-PT-030	Filtered seawater pressure from P-50004A	SAI	FLOATING	40047	-
50-PT-032	Filtered seawater pressure from P-50004B	SAI	FLOATING	40049	-
50-PT-041	Fresh water outlet pressure	SAI	FLOATING	40051	-
50-PT-047	Softening filter inlet pressure	SAI	FLOATING	40053	-
50-SI-P50004A	HP pump speed feedback	SAI	FLOATING	40055	-
50-SI-P50004B	HP pump speed feedback	SAI	FLOATING	40057	-
50-TT-021	Seawater temperature from H-50001	SAI	FLOATING	40059	-
50-TT-022	Seawater temperature from H-50001	SAI	FLOATING	40061	-
50-TT-023	Ambient air temperature inside container	SAI	FLOATING	40063	-
50-TT-024	Fresh water outlet temperature	SAI	FLOATING	40065	-
50-AT-023	Filtered seawater conductivity to P-50003A/B high	SDI	BOOLEAN	40101	0
50-AT-024	Fresh water conductivity from A-50007A/B high	SDI	BOOLEAN	40101	1
50-AT-024	Fresh water conductivity from A-50007A/B very high	SDI	BOOLEAN	40101	2
50-AT-026	Fresh water outlet total hardness high	SDI	BOOLEAN	40101	3
50-AT-026	Fresh water outlet total hardness very high	SDI	BOOLEAN	40101	4
50-AT-027	Fresh water outlet pH very low	SDI	BOOLEAN	40101	5
50-AT-027	Fresh water outlet pH low	SDI	BOOLEAN	40101	6
50-AT-027	Fresh water outlet pH high	SDI	BOOLEAN	40101	7
50-AT-027	Fresh water outlet pH very high	SDI	BOOLEAN	40101	8
50-FT-020	Seawater flow to S-50001 low	SDI	BOOLEAN	40101	9
50-FT-020	Seawater flow to S-50001 high	SDI	BOOLEAN	40101	10
50-FT-022	Filtered seawater flow from P-50003A low	SDI	BOOLEAN	40101	11
50-FT-022	Filtered seawater flow from P-50003A high	SDI	BOOLEAN	40101	12
50-FT-023	Filtered seawater flow from P-50003B low	SDI	BOOLEAN	40101	13
50-FT-023	Filtered seawater flow from P-50003B high	SDI	BOOLEAN	40101	14

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FIELD TAG/DEVICE	SERVICE	ICSS I/O TYPE	FORMAT	MODBUS REGISTER	REGISTER BIT
50-FT-024	Fresh water flow from A-50007A/B low	SDI	BOOLEAN	40101	15
50-FT-026	Fresh water outlet flow low	SDI	BOOLEAN	40102	0
50-LT-020	T-50006 level very low	SDI	BOOLEAN	40102	1
50-LT-020	T-50006 level low	SDI	BOOLEAN	40102	2
50-LT-020	T-50006 level high	SDI	BOOLEAN	40102	3
50-LT-021	T-50008 level very low	SDI	BOOLEAN	40102	4
50-LT-021	T-50008 level low	SDI	BOOLEAN	40102	5
50-LT-021	T-50008 level high	SDI	BOOLEAN	40102	6
50-LT-022	T-50002 level very low	SDI	BOOLEAN	40102	7
50-LT-022	T-50002 level low	SDI	BOOLEAN	40102	8
50-LT-023	T-50003 level very low	SDI	BOOLEAN	40102	9
50-LT-023	T-50003 level low	SDI	BOOLEAN	40102	10
50-LT-024	T-50004 level very low	SDI	BOOLEAN	40102	11
50-LT-024	T-50004 level low	SDI	BOOLEAN	40102	12
50-PDT-023	dP across S-50001 high	SDI	BOOLEAN	40102	13
50-PT-020	Seawater inlet pressure low	SDI	BOOLEAN	40102	14
50-PT-025	Filtered seawater pressure from P-50003A low	SDI	BOOLEAN	40102	15
50-PT-026	Filtered seawater pressure to P-50004A low	SDI	BOOLEAN	40103	0
50-PT-027	Filtered seawater pressure from P-50003B low	SDI	BOOLEAN	40103	1
50-PT-028	Filtered seawater pressure to P-50004B low	SDI	BOOLEAN	40103	2
50-PT-030	Filtered seawater pressure from P-50004A low	SDI	BOOLEAN	40103	3
50-PT-030	Filtered seawater pressure from P-50004A high	SDI	BOOLEAN	40103	4
50-PT-032	Filtered seawater pressure from P-50004B low	SDI	BOOLEAN	40103	5
50-PT-032	Filtered seawater pressure from P-50004B high	SDI	BOOLEAN	40103	6
50-PT-041	Fresh water outlet pressure low	SDI	BOOLEAN	40103	7
50-PT-041	Fresh water outlet pressure high	SDI	BOOLEAN	40103	8
50-PT-047	Softening filter inlet pressure low	SDI	BOOLEAN	40103	9
50-PT-047	Softening filter inlet pressure high	SDI	BOOLEAN	40103	10
50-TT-022	Seawater temperature from H-50001 low	SDI	BOOLEAN	40103	11
50-TT-022	Seawater temperature from H-50001 high	SDI	BOOLEAN	40103	12

FIELD TAG/DEVICE	SERVICE	ICSS I/O TYPE	FORMAT	MODBUS REGISTER	REGISTER BIT
50-TT-022	Seawater temperature from H-50001 very high	SDI	BOOLEAN	40103	13
50-XV-020	Seawater inlet valve open	SDI	BOOLEAN	40111	0
50-XV-020	Seawater inlet valve closed	SDI	BOOLEAN	40111	1
50-XV-020	Seawater inlet valve failure	SDI	BOOLEAN	40111	2
50-XV-021	P-50003A suction valve open	SDI	BOOLEAN	40111	3
50-XV-021	P-50003A suction valve closed	SDI	BOOLEAN	40111	4
50-XV-021	P-50003A suction valve failure	SDI	BOOLEAN	40111	5
50-XV-022	P-50003B suction valve open	SDI	BOOLEAN	40111	6
50-XV-022	P-50003B suction valve closed	SDI	BOOLEAN	40111	7
50-XV-022	P-50003B suction valve failure	SDI	BOOLEAN	40111	8
50-XV-023	P-50003A flushing valve open	SDI	BOOLEAN	40111	9
50-XV-023	P-50003A flushing valve closed	SDI	BOOLEAN	40111	10
50-XV-023	P-50003A flushing valve failure	SDI	BOOLEAN	40111	11
50-XV-024	P-50003B flushing valve open	SDI	BOOLEAN	40111	12
50-XV-024	P-50003B flushing valve closed	SDI	BOOLEAN	40111	13
50-XV-024	P-50003B flushing valve failure	SDI	BOOLEAN	40111	14
50-XV-025	Fresh water from A-50007A/B valve open	SDI	BOOLEAN	40111	15
50-XV-025	Fresh water from A-50007A/B valve closed	SDI	BOOLEAN	40112	0
50-XV-025	Fresh water from A-50007A/B valve failure	SDI	BOOLEAN	40112	1
50-XV-026	Fresh water drain from A-50007A/B valve open	SDI	BOOLEAN	40112	2
50-XV-026	Fresh water drain from A-50007A/B valve closed	SDI	BOOLEAN	40112	3
50-XV-026	Fresh water drain from A-50007A/B valve failure	SDI	BOOLEAN	40112	4
50-XV-027	Brine from A-50007A valve open	SDI	BOOLEAN	40112	5
50-XV-027	Brine from A-50007A valve closed	SDI	BOOLEAN	40112	6
50-XV-027	Brine from A-50007A valve failure	SDI	BOOLEAN	40112	7
50-XV-028	Fresh water from A-50007B valve open	SDI	BOOLEAN	40112	8
50-XV-028	Fresh water from A-50007B valve closed	SDI	BOOLEAN	40112	9
50-XV-028	Fresh water from A-50007B valve failure	SDI	BOOLEAN	40112	10
50-XV-029	Fresh water drain from A-50007B valve open	SDI	BOOLEAN	40112	11
50-XV-029	Fresh water drain from A-50007B valve closed	SDI	BOOLEAN	40112	12

FIELD TAG/DEVICE	SERVICE	ICSS I/O TYPE	FORMAT	MODBUS REGISTER	REGISTER BIT
50-XV-029	Fresh water drain from A-50007B valve failure	SDI	BOOLEAN	40112	13
50-XV-030	Brine from A-50007B valve open	SDI	BOOLEAN	40112	14
50-XV-030	Brine from A-50007B valve closed	SDI	BOOLEAN	40112	15
50-XV-030	Brine from A-50007B valve failure	SDI	BOOLEAN	40113	0
50-XV-031	Fresh water outlet valve open	SDI	BOOLEAN	40113	1
50-XV-031	Fresh water outlet valve closed	SDI	BOOLEAN	40113	2
50-XV-031	Fresh water outlet valve failure	SDI	BOOLEAN	40113	3
50-XV-032	Fresh water off-spec valve open	SDI	BOOLEAN	40113	4
50-XV-032	Fresh water off-spec valve closed	SDI	BOOLEAN	40113	5
50-XV-032	Fresh water off-spec valve failure	SDI	BOOLEAN	40113	6
50-P-50002A	Backwash pump running	SDI	BOOLEAN	40121	0
50-P-50002A	Backwash pump failure	SDI	BOOLEAN	40121	1
50-P-50002B	Backwash pump running	SDI	BOOLEAN	40121	2
50-P-50002B	Backwash pump failure	SDI	BOOLEAN	40121	3
50-P-50003A	SW booster pump running	SDI	BOOLEAN	40121	4
50-P-50003A	SW booster pump failure	SDI	BOOLEAN	40121	5
50-P-50003B	SW booster pump running	SDI	BOOLEAN	40121	6
50-P-50003B	SW booster pump failure	SDI	BOOLEAN	40121	7
50-P-50004A	HP pump running	SDI	BOOLEAN	40121	8
50-P-50004A	HP pump failure	SDI	BOOLEAN	40121	9
50-P-50004B	HP pump running	SDI	BOOLEAN	40121	10
50-P-50004B	HP pump failure	SDI	BOOLEAN	40121	11
50-P-50005A	Caustic soda dosing pump running	SDI	BOOLEAN	40121	12
50-P-50005A	Caustic soda dosing pump failure	SDI	BOOLEAN	40121	13
50-P-50005B	Caustic soda dosing pump running	SDI	BOOLEAN	40121	14
50-P-50005B	Caustic soda dosing pump failure	SDI	BOOLEAN	40121	15
50-P-50006A	Antiscalant dosing pump running	SDI	BOOLEAN	40122	0
50-P-50006A	Antiscalant dosing pump failure	SDI	BOOLEAN	40122	1
50-P-50006B	Antiscalant dosing pump running	SDI	BOOLEAN	40122	2
50-P-50006B	Antiscalant dosing pump failure	SDI	BOOLEAN	40122	3
50-P-50007A	Non-oxidant biocide dosing pump - container inlet running	SDI	BOOLEAN	40122	4
50-P-50007A	Non-oxidant biocide dosing pump - container inlet failure	SDI	BOOLEAN	40122	5

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FIELD TAG/DEVICE	SERVICE	ICSS I/O TYPE	FORMAT	MODBUS REGISTER	REGISTER BIT
50-P-50007B	Non-oxidant biocide dosing pump - container inlet running	SDI	BOOLEAN	40122	6
50-P-50007B	Non-oxidant biocide dosing pump - container inlet failure	SDI	BOOLEAN	40122	7
50-P-50008A	Non-oxidant biocide dosing pump - sea water intake running	SDI	BOOLEAN	40122	8
50-P-50008A	Non-oxidant biocide dosing pump - sea water intake failure	SDI	BOOLEAN	40122	9
50-P-50008B	Non-oxidant biocide dosing pump - sea water intake running	SDI	BOOLEAN	40122	10
50-P-50008B	Non-oxidant biocide dosing pump - sea water intake failure	SDI	BOOLEAN	40122	11
50-P-50009A	Fresh water pump running	SDI	BOOLEAN	40122	12
50-P-50009A	Fresh water pump failure	SDI	BOOLEAN	40122	13
50-P-50009B	Fresh water pump running	SDI	BOOLEAN	40122	14
50-P-50009B	Fresh water pump failure	SDI	BOOLEAN	40122	15
50-P-50010A	Non-oxidant biocide dosing pump - waste water tank running	SDI	BOOLEAN	40123	0
50-P-50010A	Non-oxidant biocide dosing pump - waste water tank failure	SDI	BOOLEAN	40123	1
50-P-50010B	Non-oxidant biocide dosing pump - waste water tank running	SDI	BOOLEAN	40123	2
50-P-50010B	Non-oxidant biocide dosing pump - waste water tank failure	SDI	BOOLEAN	40123	3
50-H-50003A	Container electrical heater start/stop command	SDI	BOOLEAN	40131	0
50-H-50003B	Container electrical heater start/stop command	SDI	BOOLEAN	40131	1
50-H-50003A	Container air fan start/stop command	SDI	BOOLEAN	40131	2
50-H-50003B	Container air fan start/stop command	SDI	BOOLEAN	40131	3
50-A-50003	Seawater coarse filter regeneration command	SDI	BOOLEAN	40131	4
50-S-50001	Sand filter regeneration command	SDI	BOOLEAN	40131	5
50-S-50004	Softening Filter regeneration command	SDI	BOOLEAN	40131	6
50-S-50010	UV sterilizer start/stop command	SDI	BOOLEAN	40131	7

End Customer	:	**CROSSWIND C.V.**
Customer	:	**Rosetti Marino S.p.A**
Equipment tested	:	**SEA WATER CORSE FILTER A-50003**

Filter in operation parameters:

- Valve 50-XV-020 — Status OPEN
- Flow transmitter 50-FT-020 — Flowrate value 2,5 m^3/h
- Pressure transmitter 50-PT-020 — Pressure value 2,0 barg minimum (out of PSC scope)
- Pressure Gauge 50-PI-048 — Pressure Value > 1.5 barg
- Number of backwash per day — < 4 (depend on the inlet water quality)

Filter in backwash operation:
(Note: if required backwash sequence will be simulated managing the set parameters)

- Backwash duration — nearly 20 seconds
- Flow transmitter 50-FT-020 — Flowrate value 0,4 / 0,5 m^3/h

TEST RESULTS		
☐ Pass	☐ Pass with comments	☐ Fail

COMMENTS	

DATE	**PSC**	**CUSTOMER**	**END CUSTOMER**

End Customer	:	**CROSSWIND C.V.**
Customer	:	**Rosetti Marino S.p.A**
Equipment tested	:	**SAND FILTER S-50001 – BACKWASH PUMPS P-50002A/B**

Filter in operation parameters:

- Flow transmitter 50-FT-020 — Flowrate value 2,5 m^3/h
- Differential pressure 50-PDI-052 — < 1 bar
- Pressure Gauge 50-PI-048 — Pressure Value > 1.5 barg
- Number of backwash per day — 1 (depend on the inlet water quality)

Filter in backwash operation:
(Note: if required backwash sequence will be simulated managing the set parameters)

- Valve 50-XV-020 — Status: closed
- Backwash duration — nearly 20 minutes
- Backwash Pumps P-50002A/B — Status: in operation
- Flow transmitter 50-FT-020 — Flowrate value 5 m^3/h
- Level transmitter 50-LV-020 — 100% full before backwash start

TEST RESULTS		
☐ Pass	☐ Pass with comments	☐ Fail

COMMENTS	

DATE	**PSC**	**CUSTOMER**	**END CUSTOMER**

End Customer	:	**CROSSWIND C.V.**
Customer	:	**Rosetti Marino S.p.A**
Equipment tested	:	**ELECTRIC HEATER H-50001**

Heater in operation parameters:

- Valve 50-XV-033 — Status CLOSED
- Heater status — In operation (not fault signal)
- Temperature Transmitter 50-TT-021 — Temperature min 10°C (set point value)

(Note: if required in case the temperature value of water inlet will be above the set point, the set point only for the test will be increased in order verify the heater operation Tmax < 25°C)

TEST RESULTS		
☐ Pass	☐ Pass with comments	☐ Fail

COMMENTS	

DATE	**PSC**	**CUSTOMER**	**END CUSTOMER**

End Customer	:	**CROSSWIND C.V.**
Customer	:	**Rosetti Marino S.p.A**
Equipment tested	:	**SOFTENING FILTER S-50004 – FRESH WATER PUMPS P-50009A/B**

Filter in operation parameters:

- Flow transmitter 50-FT-025 — Flowrate value 0,8 m^3/h
- Fresh Water Pumps P-50009A/B — Status on
- Pressure 50-PT-047 — ≤ 5barg
- TH transmitter 50-AT-026 — < 0.9 °F
- Number of regeneration per day — 1 (depend on the inlet water quality)

Filter in regeneration operation:
(Note: if required regeneration sequence will be simulated managing the set parameters)

- S-50004 — Status: Regeneration
- Regeneration duration — nearly 60 minutes

TEST RESULTS		
☐ Pass	☐ Pass with comments	☐ Fail

COMMENTS	

DATE	**PSC**	**CUSTOMER**	**END CUSTOMER**

End Customer	:	**CROSSWIND C.V.**
Customer	:	**Rosetti Marino S.p.A**
Equipment tested	:	**SEA WATER REVERSE OSMOSIS UNITS: A-50007A/B** **HIGH PRESSURE PUMPS:P-50004A/B** **BOOSTER PUMPS: P-50003A/B**

Sea water reverse osmosis unit parameters:

- Conductivity transmitter 50-AT-023 < 55000 mS/cm [@ 25°C]
- Booster pumps P-50003A/B Status On
- High pressure pumps P-50004A/B Status On
- Valve 50-XV-021 Open (line A in operation) / Close (line B in operation)
- Valve 50-XV-022 Open (line B in operation) / Close (line A in operation)
- Valve 50-XV-023 Closed
- Valve 50-XV-024 Closed
- Valve 50-XV-027 Closed
- Valve 50-XV-030 Closed
- Valve 50-XV-026 Closed
- Valve 50-XV-025 Open
- Flow transmitter 50-FT-024 ≥ 0.8 m^3/h
- Conductivity transmitter 50-AT-024 < 703 mS/cm [@ 25°C]

NOTE: Line A and Line B will be tested one at a time.

TEST RESULTS		
☐ Pass	☐ Pass with comments	☐ Fail

COMMENTS	

DATE	**PSC**	**CUSTOMER**	**END CUSTOMER**

End Customer	:	**CROSSWIND C.V.**
Customer	:	**Rosetti Marino S.p.A**
Equipment tested	:	**CAUSTIC SODA DOSING PUMPS: P-50005A/B** **ANTISCALANT DOSING PUMPS: P-50006A/B** **BIOCIDE DOSING PUMPS: P-50007A/B; P-50008A/B; P-50010A/B**

Sea water reverse osmosis unit parameters:

- Caustic Soda P-50005A/B — Status On
- pH transmitter 50-AT-027 — pH 7 – 7,9 (according to the set point value)
- Antiscalant dosing pumps P-50005A/B — Status On (0,01 l/h dosage)
- Biocide dosing pumps P-50007A/B — Status On (0,03 l/h dosage)
- Biocide dosing pumps P-50008A/B — Status On (0,85 l/h dosage)
- Biocide dosing pumps P-50010A/B — Status On (0,33 l/h dosage)

TEST RESULTS		
☐ Pass	☐ Pass with comments	☐ Fail

COMMENTS	

DATE	PSC	CUSTOMER	END CUSTOMER

PSC	**SAT REPORT** **Attachment B – Process Parameters**	Project	123A90A- Base Load Power Hub Platform
		Doc. No.	1724000448-QC-PRO-00028
		PSC Doc No.	PK2885-Q-005
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End Customer	:	**CROSSWIND C.V.**
Customer	:	**Rosetti Marino S.p.A**
Equipment tested	:	**PROCESS PARAMETERS**
Line Used	:	**.....**
Date / hour	:	**..... / .....**
Operator Name	:	**.....**

TAG NUMBER	SERVICE	INSTRUMENT TYPE	EXPECTED VALUE	MEASURED VALUE hr:	MEASURED VALUE hr:	MEASURED VALUE hr:	MEAN VALUE
50-PT-020	SEAWATER INLET PRESSURE	PRESSURE TRANSMITTER	**4 barg**				

DATE	PSC	CUSTOMER	END CUSTOMER

TAG NUMBER	SERVICE	INSTRUMENT TYPE	EXPECTED VALUE	MEASURED VALUE hr:	MEASURED VALUE hr:	MEASURED VALUE hr:	MEAN VALUE
50-TT-021	SEAWATER TEMPERATURE FROM H-50001	TEMPERATURE TRANSMITTER	**10 / 23°C**				
50-TT-022	SEAWATER TEMPERATURE FROM H-50001	TEMPERATURE TRANSMITTER	**10 / 23°C**				
50-FT-020	SEAWATER FLOW FROM H-50001	MAGNETIC FLOW TRASMITTER	**2.5 m^3/h**				
50-FT-020	SEAWATER FLOW FROM H-50001	MAGNETIC FLOW TRASMITTER	**5 m^3/h (Only Backwash)**				

DATE	PSC	CUSTOMER	END CUSTOMER

TAG NUMBER	SERVICE	INSTRUMENT TYPE	EXPECTED VALUE	MEASURED VALUE hr:	MEASURED VALUE hr:	MEASURED VALUE hr:	MEAN VALUE
50-PT-050	PRESSURE INLET S-50001	PRESSURE TRANSMITTER	**1 / 2 barg**				
50-PT-051	PRESSURE OUTLET S-50001	PRESSURE TRANSMITTER	**1 barg**				
50-PT-025	FILTERED SEAWATER PRESSURE FROM P-50003A	PRESSURE TRANSMITTER	**4 barg**				
50-PT-026	FILTERED SEAWATER PRESSURE TO P-50004A	PRESSURE TRANSMITTER	**3.5 barg**				

DATE	PSC	CUSTOMER	END CUSTOMER

TAG NUMBER	SERVICE	INSTRUMENT TYPE	EXPECTED VALUE	MEASURED VALUE hr:	MEASURED VALUE hr:	MEASURED VALUE hr:	MEAN VALUE
50-PT-027	FILTERED SEAWATER PRESSURE FROM P-50003B	PRESSURE TRANSMITTER	4 barg				
50-PT-028	FILTERED SEAWATER PRESSURE TO P-50003B	PRESSURE TRANSMITTER	3.5 barg				
50-FT-022	FILTERED SEAWATER FLOW FROM P-50003A	MAGNETIC FLOW TRASMITTER	2 m^3/h				
50-FT-023	FILTERED SEAWATER FLOW FROM P-50003B	MAGNETIC FLOW TRASMITTER	2 m^3/h				

DATE	PSC	CUSTOMER	END CUSTOMER

TAG NUMBER	SERVICE	INSTRUMENT TYPE	EXPECTED VALUE	MEASURED VALUE hr:	MEASURED VALUE hr:	MEASURED VALUE hr:	MEAN VALUE
50-AT-023	FILTERED SEAWATER CONDUCTIVITY TO P-50003A/B	ANALYZER TRANSMITTER - CONDUCTIVITY	**55000 mS/cm**				
50-PT-030	FILTERED SEAWATER PRESSURE FROM P-50004A	PRESSURE TRANSMITTER	**55 / 64 barg**				
50-PT-032	FILTERED SEAWATER PRESSURE FROM P-50004B	PRESSURE TRANSMITTER	**55 / 64 barg**				
50-AT-024 (contractual parameter)	**FRESH WATER CONDUCTIVITY FROM A-50007A/B**	**ANALYZER TRANSMITTER - CONDUCTIVITY**	**≤ 703 mS/cm**				

DATE	PSC	CUSTOMER	END CUSTOMER

TAG NUMBER	SERVICE	INSTRUMENT TYPE	EXPECTED VALUE	MEASURED VALUE hr:	MEASURED VALUE hr:	MEASURED VALUE hr:	MEAN VALUE
50-FT-024	FRESH WATER FLOW FROM A-50007A/B	MAGNETIC FLOW TRASMITTER	**0.8 m^3/h**				
50-PT-047	FRESH WATER PRESSURE FROM P-50009A/B	PRESSURE TRANSMITTER	**4,5 / 5 barg**				
50-PT-041	FRESH WATER OUTLET PRESSURE	PRESSURE TRANSMITTER	**3,5 / 4,5 barg**				
50-AT-026 (contractual parameter)	**FRESH WATER CONDUCTIVITY FROM A-50007A**	**ANALYZER TRANSMITTER - TOTAL HARDNESS**	**< 9 ppm $CaCO_3$**				

DATE	PSC	CUSTOMER	END CUSTOMER

TAG NUMBER	SERVICE	INSTRUMENT TYPE	EXPECTED VALUE	MEASURED VALUE hr:	MEASURED VALUE hr:	MEASURED VALUE hr:	MEAN VALUE
50-TT-024 (contractual parameter)	FRESH WATER OUTLET TEMPERATURE	TEMPERATURE TRANSMITTER	10 / 23 °C				
50-FT-026 (contractual parameter)	FRESH WATER FLOW FROM S-50010	MAGNETIC FLOW TRASMITTER	0.8 m^3/h				
50-AT-027 (contractual parameter)	FRESH WATER OUTLET pH	ANALYZER TRANSMITTER - pH	7 – 7.9				

Note: Test results applicable only for "contractual parameters"

TEST RESULTS		
☐ Pass	☐ Pass with comments	☐ Fail

DATE	PSC	CUSTOMER	END CUSTOMER

COMMENTS	

DATE	PSC	CUSTOMER	END CUSTOMER

End Customer	:	**CROSSWIND C.V.**
Customer	:	**Rosetti Marino S.p.A**
Equipment tested	:	**SAND FILTER S-50001 – BACKWASH**

1. Valve 50-XV-020 — Status from Open to close
2. Sea water pump stop request — Signal 50-XS-005S
3. Stop sea water feeding pump — By Rosetti Marino
4. Start backwash pumps P-50002A/B — Status On
5. Flow Transmitter 50-FT-020 — 5 m^3/h
6. Level Transmitter 50-LT-020 — 100% full before backwash start, liquid is enough to complete the backwash.
7. Duration time — 20 min

After the backwash time

8. Stop backwash pumps P-50002A/B — Status Off
9. Valve 50-XV-020 — Status from Close to Open
10. Sea water pump start request — Signal 50-HS-001S

TEST RESULTS		
☐ Pass	☐ Pass with comments	☐ Fail

COMMENTS	

DATE	**PSC**	**CUSTOMER**	**END CUSTOMER**

End Customer	:	**CROSSWIND C.V.**
Customer	:	**Rosetti Marino S.p.A**
Equipment tested	:	**SWRO SYSTEM START UP LINE A**

1.	Valve 50-XV-021	Status from Close to Open
2.	Valve 50-XV-022	Status Close
3.	Valve 50-XV-026	Status from Close to Open
4.	Valve 50-XV-027	Status from Close to Open
5.	Valve 50-XV-023	Status Close
6.	Valve 50-XV-025	Status Close
7.	Level transmitter 50-LT-020	Above low level set point
8.	Start Pump P-50003A	Status in operation
9.	Start Pump P-50004A	Status in operation
10.	Valve 50-XV-027	Status from Open to close
11.	Flow Transmitter 50-FT-024	Flowrate ≥ 0.8 m^3/h
12.	Conductivity Transmitter 50-AT-024	Cond. Value ≤ set point value
13.	Valve 50-XV-025	Status from Close to Open
14.	Valve 50-XV-026	Status from Open to Close

Note: If line A is in operation Line B is in standby

TEST RESULTS		
☐ Pass	☐ Pass with comments	☐ Fail

COMMENTS	

DATE	PSC	CUSTOMER	END CUSTOMER

End Customer	:	**CROSSWIND C.V.**
Customer	:	**Rosetti Marino S.p.A**
Equipment tested	:	**SWRO SYSTEM START UP LINE B**

1.	Valve 50-XV-021	Status Close
2.	Valve 50-XV-022	Status from Close to Open
3.	Valve 50-XV-026	Status from Close to Open
4.	Valve 50-XV-030	Status from Close to Open
5.	Valve 50-XV-024	Status Close
6.	Valve 50-XV-025	Status Close
7.	Level transmitter 50-LT-020	Above low level set point
8.	Start Pump P-50003B	Status in operation
9.	Start Pump P-50004B	Status in operation
10.	Valve 50-XV-030	Status from Open to close
11.	Flow Transmitter 50-FT-024	Flowrate ≥ 0.8 m^3/h
12.	Conductivity Transmitter 50-AT-024	Cond. Value ≤ set point value
13.	Valve 50-XV-025	Status from Close to Open
14.	Valve 50-XV-026	Status from Open to Close

Note: If line B is in operation Line A is in standby

TEST RESULTS		
☐ Pass	☐ Pass with comments	☐ Fail

COMMENTS	

DATE	PSC	CUSTOMER	END CUSTOMER

End Customer	:	**CROSSWIND C.V.**
Customer	:	**Rosetti Marino S.p.A**
Equipment tested	:	**FLUSHING LINE A**

1. Stop Pump P-50003A	Status Off
2. Stop Pump P-50004A	Status Off
3. Level transmitter 50-LT-021	100%
4. Valve 50-XV-027	Status from Close to Open
5. Valve 50-XV-023	Status from Close to Open
6. Valve 50-XV-021	Status Close
7. Start Pump P-50003A	Status On
8. Start Pump P-50004A	Status On
9. Duration time	10 – 15 minutes
10. Stop Pump P-50004A	Status off
11. Stop Pump P-50003A	Status off
12. Valve 50-XV-023	Status from Close to Open

TEST RESULTS		
☐ Pass	☐ Pass with comments	☐ Fail

COMMENTS	

DATE	PSC	CUSTOMER	END CUSTOMER

End Customer	:	**CROSSWIND C.V.**
Customer	:	**Rosetti Marino S.p.A**
Equipment tested	:	**FLUSHING LINE B**

1. Stop Pump P-50003B	Status Off
2. Stop Pump P-50004B	Status Off
3. Level transmitter 50-LT-021	100%
4. Valve 50-XV-030	Status from Close to Open
5. Valve 50-XV-024	Status from Close to Open
6. Valve 50-XV-022	Status Close
7. Start Pump P-50003B	Status On
8. Start Pump P-50004B	Status On
9. Duration time	10 – 15 minutes
10. Stop Pump P-50004B	Status off
11. Stop Pump P-50003B	Status off
12. Valve 50-XV-024	Status from Close to Open

TEST RESULTS		
☐ Pass	☐ Pass with comments	☐ Fail

COMMENTS	

DATE	PSC	CUSTOMER	END CUSTOMER

End Customer	:	**CROSSWIND C.V.**
Customer	:	**Rosetti Marino S.p.A**
Equipment tested	:	**INTERLOCK SEQUENCES**

Please refer to document nr. 1724000448-MAC-CE-00004_Rev.3_Package Cause Effect matrix to check the correct interlock sequences activation

TEST RESULTS		
☐ Pass	☐ Pass with comments	☐ Fail

COMMENTS	

DATE	**PSC**	**CUSTOMER**	**END CUSTOMER**