



SMART SERVICE AGREEMENT FOR
NK-O3 BlueBallast
An Ozone-based Ballast Water Treatment System

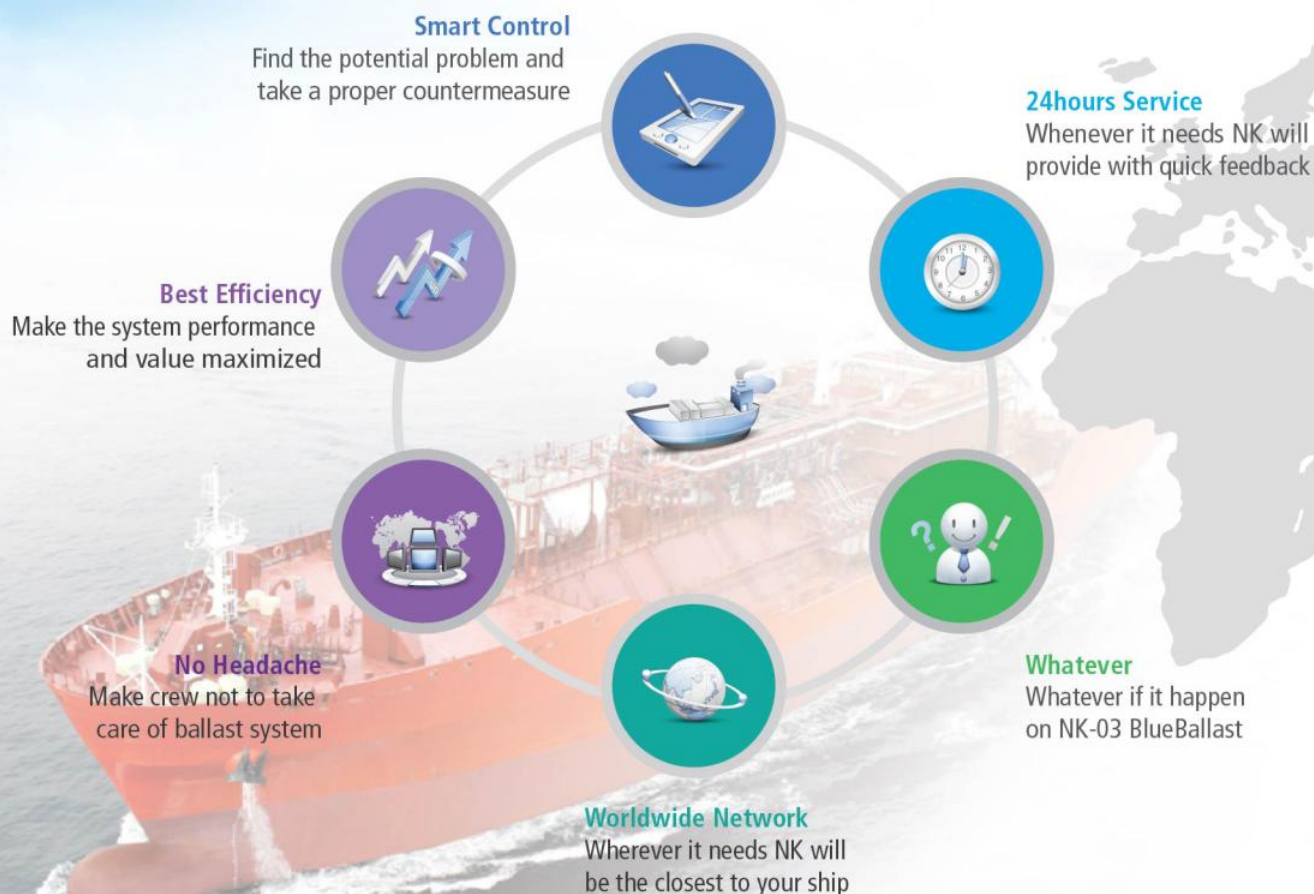
SMART SERVICE AGREEMENT FOR **NK-03 SYSTEM**

Unstoppable and Stable Operation of NK-03 system

The customers are always demanding for the higher efficiency and reducing maintenance cost for the system on board and some of the customers are now little suffering from the lack of operating and effective managing experience for Ballast water treatment system.

In order to meet these demanding, NK has developed a new range of service agreements, focusing on Maintenance and remote support to provide and ensure an optimal solution in order to reduce your daily running cost.

“Further Advantage for
smart service agreement”





The main service of smart service agreement

1 Providing full maintenance service and annual inspection service for NK-03 system for 3years.

>> Based on the agreement, regular inspection and maintenance will be carried out and this service will help owner to find an expected trouble point and take proper countermeasure in time.
The system will be covered within 3years.

2 Calibration/replacing of necessary detectors & analyzers

>> By periodic calibration and replacing service with new parts, the system can be operated properly and crew is able to save man-hour for calibration and replacement.

3 Crew training

>> The crew can be familiar with operating and maintenance about NK-03 Blueballast by training.

4 Providing necessary spare parts according to maker's standard

>> By providing all required spare parts for maintenance, crew can avoid inefficient work for purchasing spare parts within appropriate time.

5 On board service during 3years contract period if necessary

>> With worldwide network, NK provides the fastest service for 24/7.

Smart service agreement for 3year period

The Smart service agreement provide the owners with full maintenance service for 3year and annual inspection including necessary spare and maintenance.

It means ship never face with the unexpected problem and the lack of operating and effective managing of NK-03 system.



Available for only 3year annual inspection agreement

This agreement shall provide the owners with only necessary 3year annual inspection service for NK-03 system.



Periodical Service and Maintenance list for NK-O3 Blue Ballast System

No.	Description	Operation (Item)	Working scope			Responsibility		Intervals(years) Note : Cleaning, Replace or Calibrate shall be done with ahead of the completion of Life time or Intervals							Remark
			Cleaning /Overhaul / Condition check	Replacing the parts	Calibration	Crew	Service Company	Life time	1	2	3	4	5	etc.	
1	Air compressor	Change oil and oil filter		●		◎	◎	4,000 hour			●				
		Replace the air filter element		●		◎	◎	2,000 hour			●				
		Clean the filter element of the electric cabinet	●			◎	◎							Monthly	
		Check spring for safety valve	●			◎	◎	4,000 hour			●				
		Check and replace the oil separator element if necessary	●			◎	◎	2,000 hour			●				
		Regrease motor for the interval and quantity	●			◎	◎	1,000 hour							
		Check the drain hose and replace if necessary	●			◎	◎							10 years	
		Overhaul	●				◎							10 years	
2	Air dryer	Replace air filter element (PD,DD)(set)		●		◎	◎	2,000 hour			●				
		Overhaul	●				◎							10 years	
3	Air Receiver Tank	Check spring for safety valve	●			◎	◎	4,000 hour			●				
4	Oxygen Generator	Replace filter element (QD120/ QD 280)(set)		●		◎	◎	2,000 hour			●				
		Checking level of zerolite	●				◎						●		
5	Oxygen Receiver Tank	Check spring for safety valve	●			◎	◎	4,000 hour			●				
6	Ozone Generator	Replace air filter(ea)		●		◎	◎	2,000 hour			●				
		Clean dielectric tube & vessel	●				◎	4,000 hour						10 years	
		Clean converter cooling line	●			◎	◎		●						
		Check converter cooling hose and replace if necessary	●			◎	◎						●		
		Clean ventilation filter and replace it if necessary	●			◎	◎	500 hour						6 months	
		Overhaul	●				◎							10 years	
7	Water Chiller	Change compressor oil and oil filter		●		◎	◎	4,000 hour			●				
		Check refrigerants and recharge if required	●			◎	◎	4,000 hour			●				
		Replace PLC battery (ea)		●		◎	◎				●				
		Check fresh cooling water condition and change if required	●	●		◎	◎							Every time Before operating	
		Overhaul	●				◎							10 years	
8	Ozone Control Skid	Replace catalys (kg)		●		◎	◎							10 years	
		Clean MFC valve	●			◎	◎	2000 hour			●				
9	Neutralizer Tank	Sodium Thiosulfate, 25kg/pack (1-time quantity for deballasting shall be kept)		●		◎	◎	Mixed in tank : 1 year As powder : 2 years	●	●					
		Stabilizer agent, 1kg(ea)		●		◎	◎	Mixed in tank : 1 year As powder : 5 years	●	●					
10	TRO of DPD	Replace reagent (ea)		●		◎	◎							Every 3-month after open the reagents cap	
		Clean the colorimeter	●			◎	◎							Every time after operating	
11	TRO of electric	Clean sensor	●			◎	◎							Every 3-month after operating	

12	Re circulation pump	Check mechanical seal and replace if required (ea)		●		◎	◎				●				
13	Two weeks periodical maintenance of system	Before operation	●			◎	◎							Every 2 weeks	According to :Two weeks periodical maintenance procedure
		Periodical maintenance for ozone injection line	●			◎	◎							Every 2 weeks	
		Periodical maintenance for TRO	●			◎	◎							Every 2 weeks	
		Periodical maintenance for Neutralizer tank	●			◎	◎							Every 2 weeks	
		Periodical Auto opearation check for Ballasting	●			◎	◎							Every 2 weeks	
14	Instrument	Replace oxygen detector (ea)		●		◎	◎	2.5 Years						2.5 Years	
		Replace ozone detector (ea)		●		◎	◎	2.5 Years						2.5 Years	
		Calibrate dew point transmitter (ea)			●	◎	◎	5 Years				●			1.Not necessary but recommendation 2.NK will supply calibrated sensor on board and replaced by ship's crew or NK engineer.
		Calibrate oxygen analyzer (ea)			●	◎	◎	5 Years				●			Ditto
		Calibrate ozone analyzer (ea)			●	◎	◎	5 Years				●			Ditto
		Calibrate TRO analyzer on board by Portable TRO analyzer (ea)			●		◎					●			Not necessary but recommendation
		Check seasater flow transmitter indicator (ea)	●				◎		●						



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