Environment and Energy Program Performance in 2023

Significant Environmental Aspect	Environment/Energy Objective		Performance			P.I.C.
	Target	Criteria(Q'ty)	Result	Achievement(%)	Details	
Marine pollution due to emergencies such as hull damage, etc.	**Prevent emergencies and minimize damage**	**The number of Marine pollution Accident from emergencies (ZERO)**	Marine pollution Accident (1)	0	❑ Continuous verification of safety procedures through audit/inspection ❑ Continuing to improve work safety procedures, including risk assessment and implementing Feedback to ships ❑ Ship's familiarization with contingency procedures and execution of emergency drill ❑ Thorough management of shipboard oil response equipment and waterproofing materials for each ship ❑ The number of Marine pollution accident : 1 ■ HYUNDAI OAKLAND : An oil spill of approximately 25L occurred at sea due to the engineer in charge's improper handling for oil transfer between tanks and the chief engineer's negligence in practical management. [**Countermeasure to prevent recurrence**] ✓ Education has been implemented in each ships that the engineer in charge completes and complies checklists under supervision by Chief engineer and prohibition of tank level alarm off-scan. ✓ Introduction of deck scupper plug airtightness PMS and implementation of inspection/management to prevent oil spills on deck to sea	SHIP, MT, QAT
Marine pollution due to malfunction of machinery/ equipment	**Prevent malfunction of marine pollution prevention machinery/ equipment and minimize damage**	**The number of Marine pollution Accident from malfunction of machinery / equipment (ZERO)**	Marine pollution Accident (ZERO)	100.0	❑ Optimal management of pollution prevention machinery/equipment ■ Oily bilge separator 15ppm Monitoring System Calibration performed **(Plan : 39 ships / Performance : 37 ships)** ■ CNTR 1T : 5 ships, CNTR 2T : 10 ships, CNTR 3T : 9 ships, TANKER : 14 ships, LNG&BULK T : 1 ship ■ In case of Tanker/LNG fleets, annual calibration is being carried out in accordance with the requirements of major company and MESQAC ❑ Execution of Maintenance complying PMS for each ship and maintaining records	SHIP, MT

<table>
<tr>
<td rowspan="2">Air pollution from ship operation</td>
<td>Minimize fuel consumption and increase energy efficiency</td>
<td>F.O consumption intensity (0.8124 g/DWT*km)</td>
<td>0.6936</td>
<td>114.6</td>
<td>❑ Annual performance of F.O consumption intensity
<table>
<tr><th></th><th>2020</th><th>2021</th><th>2022</th><th>2023</th></tr>
<tr><td>CNTR</td><td>1.0058</td><td>0.9315</td><td>0.9428</td><td>0.8515</td></tr>
<tr><td>TANKER</td><td>0.3594</td><td>0.3462</td><td>0.3541</td><td>0.3531</td></tr>
<tr><td>BULK</td><td>0.6972</td><td>0.7508</td><td>0.7056</td><td>0.5081</td></tr>
<tr><td>LNG</td><td>0.8810</td><td>0.9536</td><td>1.2213</td><td>0.7888</td></tr>
<tr><td>MPV</td><td>-</td><td>1.9900</td><td>2.0114</td><td>2.0000</td></tr>
<tr><td>TOTAL</td><td>0.8171</td><td>0.8140</td><td>0.8307</td><td>0.6936</td></tr>
</table>
❑ Target : Value of 1% improvement of the 3 years average (2020-2022)
■ CNTR fleet
① F.O consumption intensity has been reduced following the effective route planning and declination of port congestion.
② F.O consumption intensity has been reduced through monitoring of RPM operation and F/back to each ships.
■ LNG fleet : F.O consumption intensity has been reduced compared with last year due to the use of BOG mainly for fuel.
■ BULK fleet : F.O consumption intensity has been reduced by returning ships of BDRM,BPVI which has poor fuel efficiency and taking over bigger DWT ship TGPI.</td>
<td>SHIP, QAT</td>
</tr>
<tr>
<td>Minimize fuel consumption and increase energy efficiency</td>
<td>Hull fouling management (115 ships)</td>
<td>104 ships</td>
<td>90.4</td>
<td>❑ Hull fouling management
■ Increase of fuel efficiency through minimizing hull resistance increase caused by biofouling on hull
■ Hull inspection performed (Plan : 115 ships / Performance : 104 ships)
① CNTR fleet : Implementation every 6 months regardless of service route (planned to be implemented twice a year per each ships)
-. CNTR 1T: 26 ships, CNTR 2T : 30 ships, CNTR 3T : 28 ships
-. Non-achievement ship for twice a year due to schedule delay and route changes has planned to implement inspection in Jan~Feb.
② Other fleet except CNTR : Implementation based on condition
-. TANKER : 14 ships (performed by all tanker fleet)
-. LNG : 1 ship (GHEO)
■ BULK : 5 ships (TGLT, TGST, TFSS, BDRM, BPVI)</td>
<td>MT, R&D</td>
</tr>
</table>

Air pollution from ship operation	**Minimize fuel consumption and increase energy efficiency**	**Reduction of fuel consumption (-0.85%, reduction rate compared to baseline in 2022)**	-0.14%	183.5	❑ Fuel consumption in 2022 : 766,665 M/T (BASELINE) ❑ Fuel consumption in 2023 : 767,738 M/T ■ 0.14% reduction compared to 2022 ❑ Machinery applied : Main Engine, Aux. Engine (Aux. Boiler excluded) ❑ 2.1k CNTR : The ship was excluded due to lack of data through being handed over to 2022/23 years.	R&D
Marine pollution from ship operation	**Minimize emission of VOCs**	**Related Machinery /Equipment PMS overdue (Case ZERO)**	Overdue item ZERO	100.0	❑ VOCs emission at right time and right place through the maintenance for related machinery/equipment with complying PMS. ■ As a result of confirmation for PMS half a year, there was no PMS overdue history for related machinery/equipment(High velocity PV valve) In TANKER fleet. ❑ According to VOC management plan, optimal control of VOC related to cargo operation has been carried out through complying emission minimizing procedure and recording for VOCs.	TANKER
	Legal operation of Incinerator	**Incinerator procedure (Violation ZERO)**	Violation ZERO	100.0	❑ No violation existed.	QAT, MT
	Compliance with fuel oil sulfur oxide emission regulations	**fuel oil sulfur oxide emission regulations (Violation ZERO)**	Violation ZERO	100.0	❑ SCRUBBER operation and use of low-sulfur fuel oil to comply with ship sulfur oxide emission regulations ■ SCRUBBER operation status (58 ships of 73 ships) ■ CNTR 39 ships, TANKER 11 ships, BULK 4 ships, MPV 4 ships ■ 7 ships operating SCRUBBER added compared with last year. → 3 TANKER(Taking over used ships), 3 BULK (taking over used 1 ship, 2 installation newly), 1 MPV(installation newly). ❑ 15 ships not using SCRUBBER are using VLSFO with sulfur content of 0.5% or less.	MT, QAT

<table>
<tr>
<td rowspan="3">Marine pollution from ship operation</td>
<td>Legal management of Garbage</td>
<td>Disposal of Garbage (Violation ZERO)</td>
<td>1 Violation</td>
<td>0</td>
<td>❑ Prevention of dumping at sea and compliance with regulations through efficient storage of waste and compliance with management procedures
■ Ships operating the plastic compactor and garbage grinder (61 ships of 73 ships)
① CNTR fleet : 41 ships of 48 ships in operation (85%)
→CNTR except HHDT, HHVO, HHSU, HHBV, HHCR, HHFA, HHFC
② TANKER Fleet : 10 ships of 14 ships in operation (71%)
→OULD, OUWN, OUCA, OUPT, OUVT, OODD, OOGL, OGDR, OGFT, OGHP
③ BULK Fleet : 6 ships of 6 ships in operation (100%)
④ MPV Fleet : 4 ships of 4 ships in operation (100%)
⑤ LNG Fleet : 0 ship of 1 ship in operation (0%)

❑ 1 case of violation in garbage discharge regulation
■ HMM DHAKA : Discharge of food waste at sea within 12 nautical miles of China territorial sea (8.3 nautical miles from China baseline) → Violation of MARPOL
[Countermeasure to prevent recurrence]
✓ Guidance for compliance with regulation through reflection of procedures and ship guidance completed.</td>
<td>MT,
QAT</td>
</tr>
<tr>
<td>Minimize generation of Waste oil</td>
<td>Waste oil generation ratio (1.81%)</td>
<td>1.93 %</td>
<td>93.4</td>
<td>❑ Annual performance of W.O generation (%)
<table>
<tr><th></th><th>2020</th><th>2021</th><th>2022</th><th>2023</th></tr>
<tr><td>W.O generation (%)</td><td>1.73</td><td>1.83</td><td>1.92</td><td>1.93</td></tr>
</table>
■ LNG Fleet : W.O generation rate increased due to the main use of BOG for fuel.
■ CNTR Fleet : W.O generation rate increased due to the decrease in fuel consumption due to slow steaming from voyage sliding and waiting for berthing schedule.
■ W.O generation increased due to due to poor quality of fuel oil supplied.
■ The average rate of W.O generation (%) has almost remained as last year overall.
■ Countermeasure to reduce the rate : Considering quality of fuel, optimization for discharge time of Purifier and thorough maintenance following PMS.</td>
<td></td>
</tr>
<tr>
<td>Legal management of Ballast water</td>
<td>Ballast water management regulation/ convention (Violation ZERO)</td>
<td>Violation ZERO</td>
<td>100.0</td>
<td>❑ Compliance with procedures, regulations and record management according to the ballast water management plan

❑ BWMS Operation status (73 ships of 73 ships)
■ CNTR 48 ships, TANKER 14 ships, LNG 1 ship, MPV 4 ships, BULK 6 ships
■ 11 ships operating BWMS added compared with last year.
→4 CNTR(taking over used 1 ship, 3 installation newly), 6 TANKER(taking over used 4 ships, 2 installation newly), 1 BULK(taking over used 1 ship)

❑ According to BWTS installation, Revision of BWMP (reflecting D-2) and re-issue of IBWMC would be conducted.</td>
<td>MT,
QAT</td>
</tr>
</table>

Marine pollution from ship operation	**Legal operation of SCRUBBER**	**SCRUBBER washwater discharge regulation (Violation ZERO)**	3 Violations	**0**	❑ Control area to ban discharge of washwater from SCRUBBER updated continuously. ■ 3 Cases of Violation in SCRUBBER washwater discharge regulation. ① HMM STOCKHOLM : Violation of washing water discharge due to miss operation by crew during departing from CNTAO. →Violation of ban discharge of SCRUBBER washwater in ECA ② HMM ST.PETERSBURG : Violation of washing water discharge due to miss operation by crew during departing from CNTAO. →Violation of ban discharge of SCRUBBER washwater in ECA [**Countermeasure to prevent recurrence**] ✓ Completed to give feed-back to all ships about the case of violation. ✓ Educated and Supplemented company procedures for SCRUBBER operation. -. Management of SCRUBBER log data and method of record in log book ✓ Verification of the results of SCRUBBER operation in ECA for all ships ③ HMM DUBLIN : Operation over IMO regulation's operational limit of turbidity at the time of mode change (close loop → open loop) when leaving out ECA after departure from CNTAO/YTN [**Countermeasure to prevent recurrence**] ✓ Completed to give feed-back to all ships about the case of violation. -. Thorough monitoring and taking caution against monitoring of each value at the time of mode change. ✓ Educated and company procedures for SCRUBBER operation. -. Turbidity value has been improved by maximizing the initial amount of seawater input when changing the mode by changing the internal parameters of the control panel. -. When problems occur like exceeding limit of regulations during mode change, change the mode again and change after the action is completed. (Close loop→Open loop(if, exceeds limit)→Close loop→Open loop)	MT, QAT
	Compliance with regional regulations for various incidental discharges from ship operation.	**National discharge regulations (Violation ZERO)**	Violation ZERO	100.0	❑ Identify and thoroughly comply with regional regulations such as US VGP regulations, VOC, gray water, and sewage discharges, etc. ■ Addition of APM implementation procedures for whale protection following Northwest Mediterranean PSSA designation. ❑ APM (Associated protective measures) ; Reducing speed and maintaining safe distance from whales, etc.	MT, QAT

<table>
<tr>
<td rowspan="4">Resources management of office</td>
<td rowspan="2">Reduce fuel oil consumption for vehicle</td>
<td>Gasoline</td>
<td>21,509ℓ</td>
<td>24,046 ℓ</td>
<td>88.2</td>
<td rowspan="3">❑ Annual environment performance of office
<table>
<tr><th></th><th>2020</th><th>2021</th><th>2022</th><th>2023</th></tr>
<tr><td>Gasoline (ℓ)</td><td>17,197</td><td>19,975</td><td>23,110</td><td>24,046</td></tr>
<tr><td>Diesel (ℓ)</td><td>120</td><td>43</td><td>120</td><td>273</td></tr>
<tr><td>Boiler (Nm^3)</td><td>42,903</td><td>41,791</td><td>24,129</td><td>-</td></tr>
<tr><td>Cooking Facility (Nm^3)</td><td>14,251</td><td>12,415</td><td>5,794</td><td>-</td></tr>
<tr><td>Electricity (MWh)</td><td>2,765</td><td>2,920</td><td>2,004</td><td>995</td></tr>
<tr><td>Employee</td><td>919</td><td>940</td><td>958</td><td>946</td></tr>
<tr><td>Energy consumption (MJ)</td><td>12,704,303</td><td>13,229,769</td><td>9,086,457</td><td>4,320,886</td></tr>
<tr><td>Energy consumption (MJ/person)</td><td>13,824</td><td>14,074</td><td>9,485</td><td>4,567</td></tr>
</table>
❑ Usage and number of vehicles increase as face-to-face work increases.
❑ Increased use of vans using diesel for gatherings and customer visits, etc.
❑ As a result of relocation of the office building, Total usage of the electricity is reduced due to a decrease in the number of EHPs with high power consumption
❑ The boiler and cooking facility not used due to relocation of office building.</td>
<td rowspan="3">CAD</td>
</tr>
<tr>
<td>Diesel</td>
<td>143 ℓ</td>
<td>273 ℓ</td>
<td>9.2</td>
</tr>
<tr>
<td>Reduce the electricity</td>
<td colspan="2">Electricity (2,571 MWh)</td>
<td>995 MWh</td>
<td>161.3</td>
</tr>
<tr>
<td>Reduce the LNG fuel</td>
<td>Boiler, Cooking Facility</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td colspan="2"></td>
</tr>
</table>