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Conclusion of Joint Venture Agreement on "Verification of Marine Nano Emulsion Fuel as well as Manufacturing Systems"

-Validation of simultaneous reduction of fuel consumption and NOx on a real ship

Nippon Kaiji Kyokai (Class NK)  
Universal Shipbuilding Corporation  
Nanomizer Inc.

Nippon Kaiji Kyokai (NK; Headquarters located in Chiyoda-ku, Tokyo; Chairman: Noboru Ueda), Universal Shipbuilding Corporation (Head Office located in Kawasaki; President: Shinjiro Mishima) and NANOMIZER Inc. (Head Office located in Yokohama; CEO Takehiko Matsumura), has concluded a joint venture agreement which using water emulsion, aims to verify the technical feasibility of simultaneous reduction of CO<sub>2</sub> and NO<sub>x</sub> from vessel engine.

NANOMIZER's wet-type super-pulverization technology was developed upon applying the oil and water emulsification. Water emulsion fuel is produced by dispersing minute water particles homogeneously within the fuel oil. By using the water emulsion fuel, it is intended to increase the combustion efficiency of internal combustion engines and to reduce NO<sub>x</sub> and other emissions.

Universal Shipbuilding and NANOMIZER have been verifying the adaptability of water emulsion fuel to vessels. Toward actual application to vessels, the development will be propelled making use of a joint research scheme of NK to offer monetary assistance intended to respond to industry's requests.

Now, this one-year test period will be to evaluate the NEFS onboard a shipping vessel under actual sea conditions, as well as verification tests to check engine ignition and operating performance at various loads to prove that there is no adverse impact on safety and performance in ship operations.

Verification of effectiveness of emulsion fuel system will be useful to NO<sub>x</sub> regulations as a composite technology, also further demonstration of fuel efficiency will help upgrade earth environment and achieve a worthy goal in marine vessel sector.

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