

## EMERGENCY RESPONSE PROPOSAL TO FIGHT THE OILSPILL IN THE GULF OF MEXICO WITH THE NEW FUTURA-SOS-SYSTEM.

The FUTURA-SOS-System, developed and designed to fight large oil spills in very challenging and specific operating conditions. In calm seas and in rough open seas. Absolutely unmatched today.

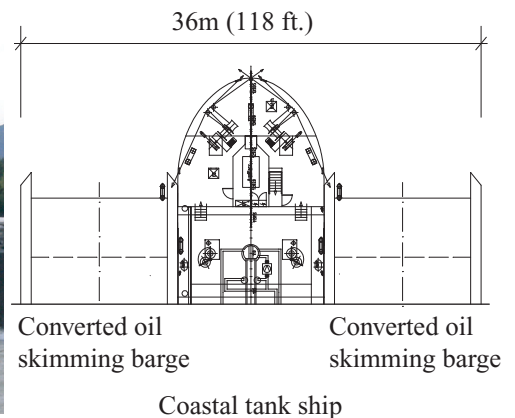
Tank tests



The skimming bow



The project proposal



A FUTURA-SOS-System built up from converted barges and a chartered Coastal tank ship can start oil spill fighting operation in less than 20 days from the start of the project!

### Performance of one FUTURA-SOS-System:

The operation (skimming) speed of the system is between 2,25kn and 4,00kn.  
 The skimming efficiency for significant wave heights between 0 and 2 m (6.6 ft) - significant wave height of 2 m includes waves of a height of 3,72 m (12,2 ft) – is about 95 to 70 %!

The cleaned water volume with 2,25 kn is: 1 Billion Liters per day (264.200.793 US gal.)  
 with 4,00 kn is: 1.778.000.000 Liters per day (469.749.009 US gal.)

### The skimmed oil is not lost, it can be processed and sold.

The cleaned sea area per day and per FUTURA-SOS-System is:

System speed 2,25 kn : 3,6 sq km, 3.600.288 sq m or 38.754.446 sq ft  
 System speed 4,00 kn : 6,4 sq km, 6.400.512 sq m or 68.806.792 sq ft

The estimated costs per day of 24 hour operation per proposed FUTURA-SOS-System (one coastal tank ship with two converted barges) will be below 10.000.- \$ US.

### We are ready to start!

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## EMERGENCY RESPONSE PROPOSAL TO FIGHT THE OILSPILL IN THE GULF OF MEXICO WITH THE NEW FUTURA-SOS-SYSTEM.

### **We are**

The FUTURA-SHIPS GmbH, registered in Kiel, Germany under HRB 11111 KI, a small but innovative Engineering Office developing and design technology mainly for the maritime market.

We have accompanied and assisted the Technical University of Berlin in the past years in the role of an industrial consultant/partner in the development of the Sea State-Independent Oil Skimming System SOS. This system is patented for the University of Berlin and the FUTURA-SHIPS GmbH is the worldwide exclusive licensee for the SOS System.

The system has been optimized in various simulation scenarios and tank tests. It has proven it's superior performance in these tank tests. The innovative technology is now ready to be built.

### **We propose**

A “quick and dirty” real test as performance demonstration within the scenario of the oil spill disaster in the Gulf of Mexico.

We would take, the up scaled geometry of the SOS system used successful as model in the last tank tests. One would charter or buy two used barges available in the Mississippi Delta area and convert these barges into SOS skimming barges, implementing the SOS moon pool in a short and simple shipyard retrofit operation into these barges. To later rebuild the barges will be possible.

An available coastal tank ship will be chartered and will serve as towing and storage ship during the skimming operation. The two converted SOS barges are moored as skimming platforms one to either side of the tank ship. As this linked unit moves into the oil spill the skimmed oil is pumped continuously from the sloshing sections (oil sumps) of the SOS moon pool into the tanks of the towing tank ship.

Thus the skimming draught of the barges alongside the towing tank ship remains unchanged.

For details please refer to the sections:

- **The SOS technology.**
- **The project sketch.**
- **The estimated project schedule.**

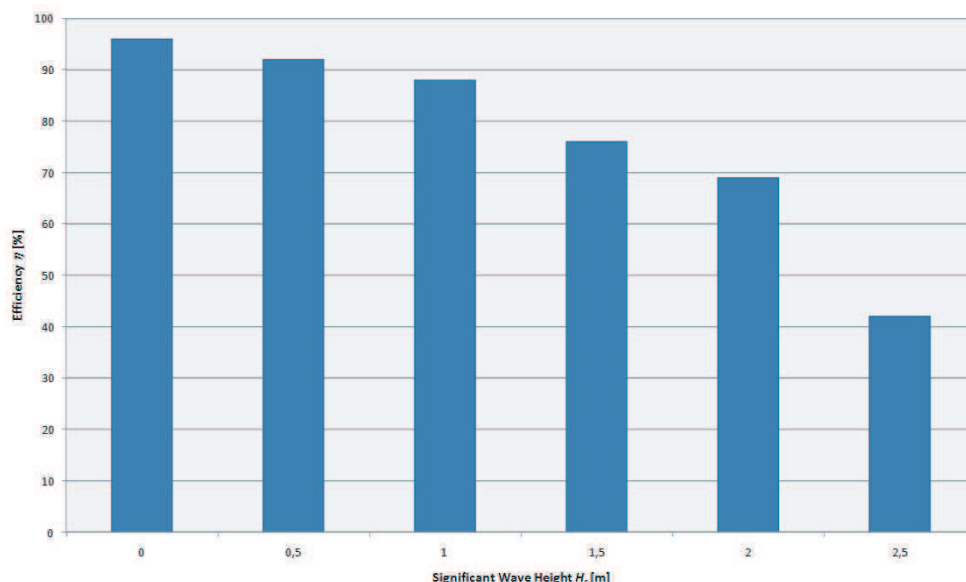
## THE SOS TECHNOLOGY

### Seegangsunabhängiger Ölskimmer-SOS

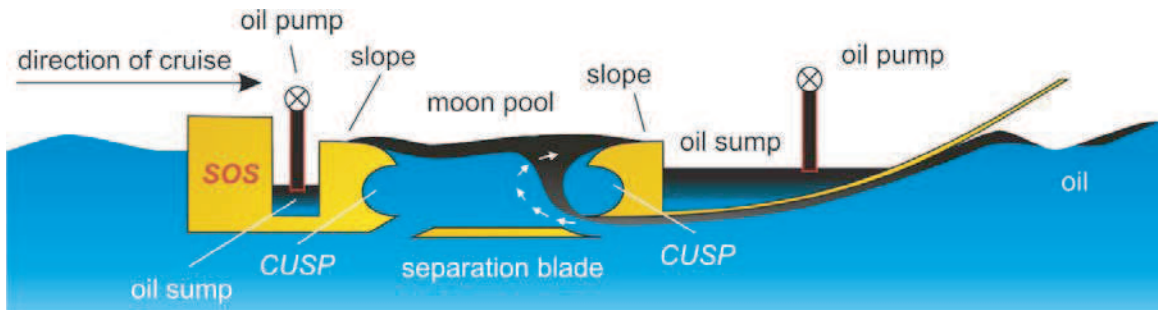
Der bereits in Deutschland und den USA patentierte SOS basiert auf einem rein hydromechanischen Konzept und ist sehr robust, da er ohne bewegliche Teile auskommt. Das Bugsegment des Skimmers gleitet über die Wasseroberfläche, wobei es die Wellen dämpft. Während der Fahrt wird der Ölfilm unter den Skimmerbug des SOS gedrückt und strömt unterhalb des Rumpfes bis zu einer Separationsklinge, welche die Grenzschicht mit dem Öl von der Hauptströmung trennt. Die Ölpartikel treten in einen Moonpool ein, wobei sie durch einen geometriebedingten Wirbel an der scharfen Hinterkante des Bugsegments zusätzlich zur Auftriebswirkung in Richtung der freien Wasseroberfläche innerhalb des SOS beschleunigt werden. Seeganginduzierte Sloshing-Bewegungen im Moonpool transportieren das aufschwimmende Öl mit möglichst geringem Wasseranteil über Böschungen in Ölsümpfe, von wo es in hoher Konzentration abgepumpt wird. Der Moonpool ist mit zwei spiegelbildlich angeordneten sog. CUSP-Formen ausgestattet. Solche Geometrien werden zur Reduzierung des Widerstandes bei Vollheckfahrzeugen wie z.B. Bussen oder Lastwagen eingesetzt. Im Fall des SOS dienen die CUSP-Formen der Stabilisierung der Wirbel im Moonpool, welche eine zentrale Rolle im Öl-Wasser-Separationsprozess einnehmen, sowie der Minimierung des Ausflusses von Ölpartikeln aus dem Moonpool.

### Sea State-Independent Oil Skimming System – SOS

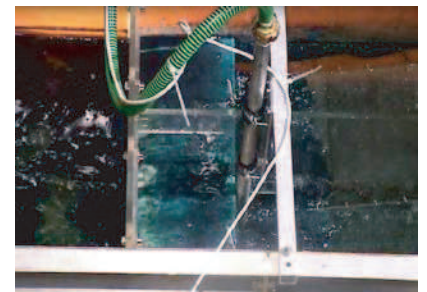
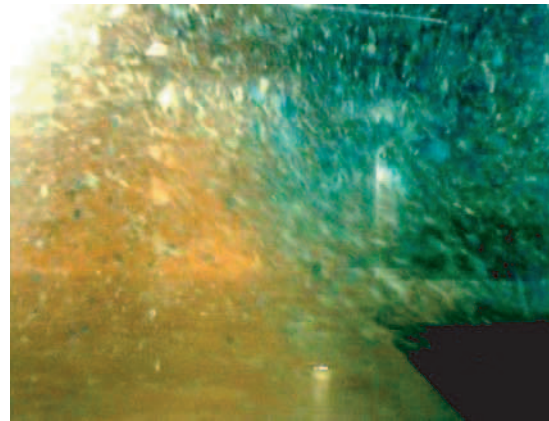
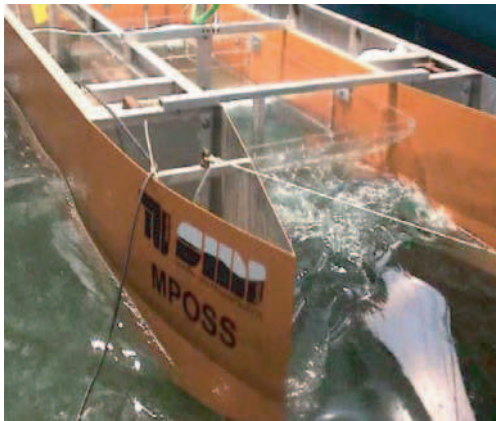
The sea state-independent oil skimming system has already been patented in Germany and the United States. The skimming concept is based on purely hydrodynamic principles and is extremely robust since it works without moving parts. A specially shaped bow segment glides on the water surface, damping the waves. The oil layer flows underneath the SOS bow towards a transverse blade, which separates oil from water. At the trailing edge of the bow segment, a vortex develops and accelerates the oil particles in addition to their positive buoyancy to the free water surface of the moon pool. Wave-induced sloshing effects convey the oil over adjustable slopes into oil sumps from where it is pumped off. The moon pool is equipped with so-called CUSP designs. This particular geometry is utilized to reduce resistance at the stern of vehicles. In case of the SOS, the CUSP serves the purpose of stabilizing the vortex behind the bow segment as well as retaining the skimmed oil in the moon pool.



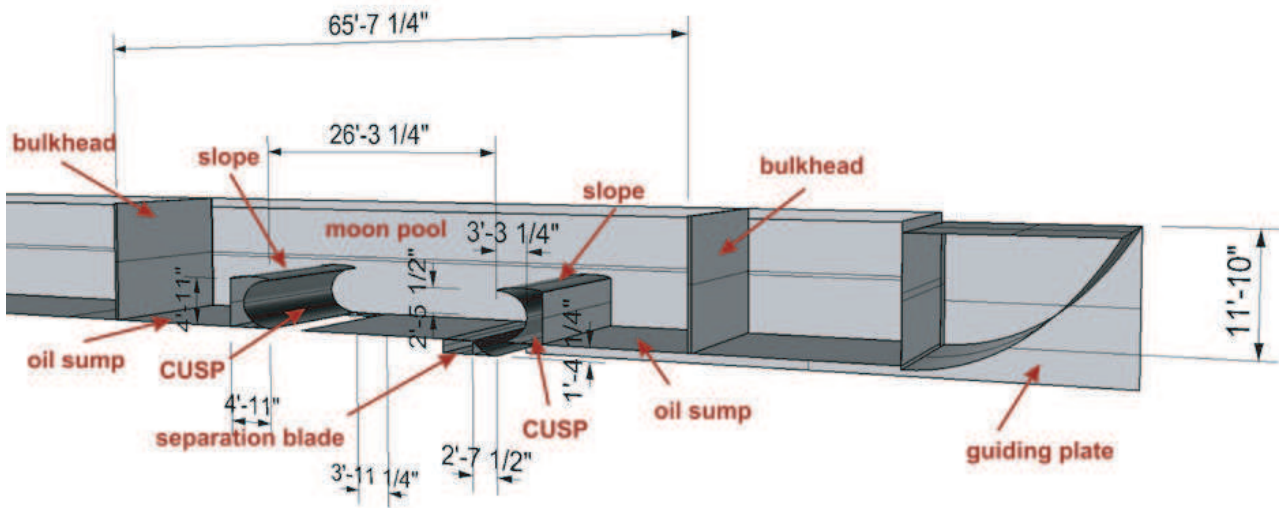
Efficiency (Flux of Skimmed Oil Related to the Total Discharge of Oil)  
for a SOS System of 33 m Length at  $v = 2.25$  kn



Functional Principle of the SOS

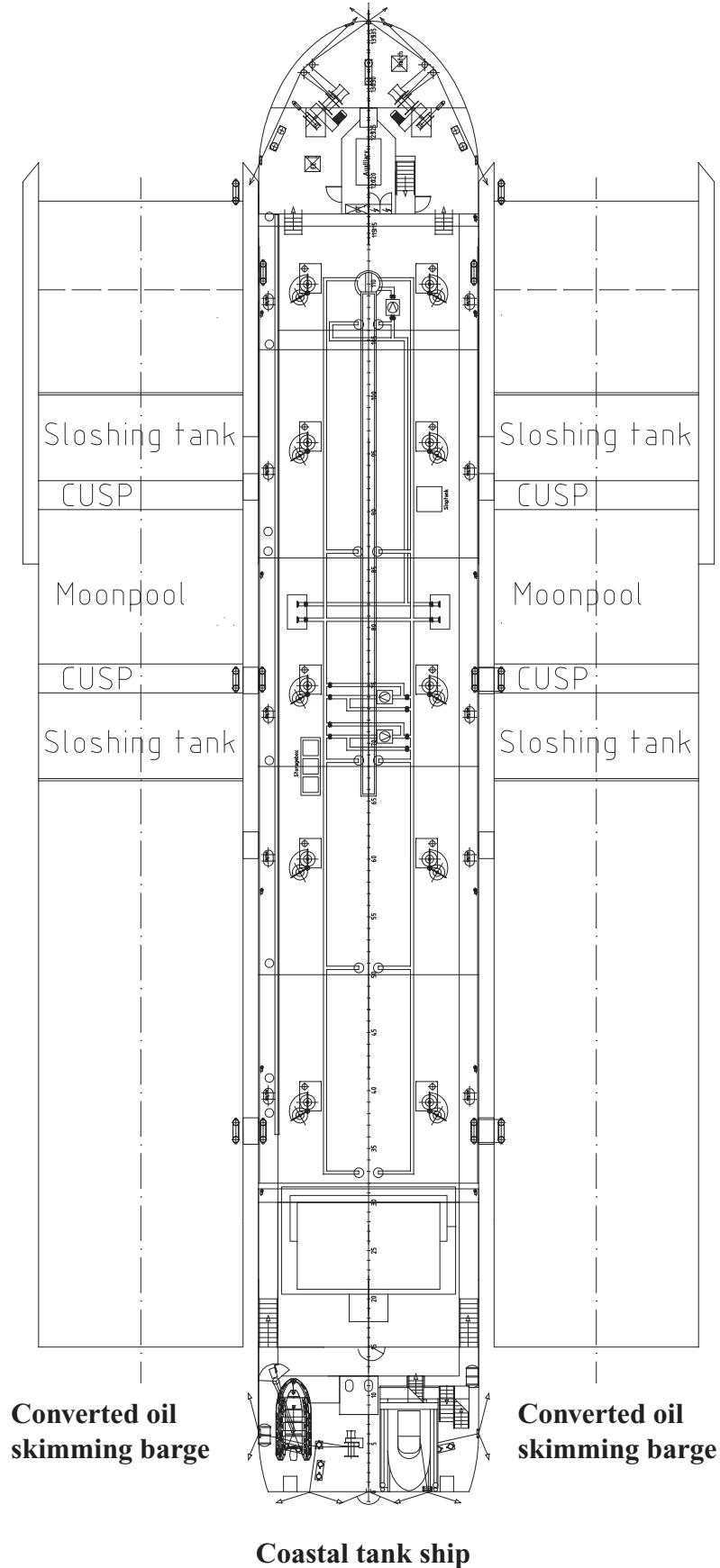


SOS Model in the Seakeeping Basin of TU Berlin (top left); Vortex inside the Moon Pool above the Inlet Opening (top right), Top View of the Moon Pool with Oil being transported into the Sumps (bottom)



Principal Sketch of a Common Hopper Barge converted into a SOS

THE PROJECT SKETCH



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### The estimated projekt schedule

Under the topic: “ time is of essence”.

- ask questions, answer questions, clarify details approx. 3 days
- propose, discuss and agree on contractual arrangements approx. 3 days
- project pre-engineering, clarify with Class and Coast Guard, planning details, work preparation, charter or buy barges and charter tank ship approx. 7 days
- parallel conversion of 2 used barges into 2 SOS skimming barges, based on estimated max. 4500 man hours per barge by a German shipyard. Work done by an American shipyard locally in 3 shifts per day. Drawings and work preparation tailored for this shipyard. approx. 14 days
- prepare the vessels for the skimming operation approx. 2 days

Start of the “quick and dirty” real test performance demonstration.

As this system has not been in operation so far, a guarantee for the performance of the SOS system is not possible. But the developers of the system and the designers of the system are very confident that it will work successful and contribute to the reduction of the environmental effects of the disastrous oil spill.

We believe this project will be worth the risk involved in the light of the damages already happened and still to be expected in the future.

When this first performance demonstration delivers satisfactory results, the required number of barges to fight the entire oil spill could be converted and put into service in a short time.

In the future, given all the tests, have proven to be successful, the FUTURA MULTIROLE SHIP as Offshore Supply Vessel should be the final goal for external (back up) safety in the offshore oil exploration.