

ENVIRONMENTAL IMPACT STUDY ON SHIPS OPERATING IN PROXIMITY OF LOADING BUOYS IN MIDIA HARBOUR AREA



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PURPOSE OF THIS STUDY

The S.C. PETROMIDIA S.A. refinery is located 35 km north of Constanta City near Midia harbor. It was build for the purpose of purifying imported oil and for the re-export of the processed product. The refinery has a capacity of 14000 t/day which means **XX** thousands tons/year.

SC PETROMIDIA - SA is responsible for most of the import of oil and re-export of the finished products, respectively diesel fuel, petrol etc. by Constanta harbor.

Thus, oil unloading from heavy-duty ships is fulfilled in Constanta harbor, inside the oil terminal which belongs to the OIL TERMINAL Company. On top of that the transport from Constanta to Midia is done by means of pipelines owned by PETRO-TRANS Company. Re-export end-products run through the same system in reverse, as Midia harbor can let in only ships with maximum capacity of 10.000 DWT. Usage costs of Constanta terminal and transport are high and have a major impact on exploitation costs.

At the same time, S.C. PETROMIDIA S.A. has increased the refinement and delivery capacity of oil products via their own unloading oil dock located in Midia harbor. Most of the ships operating here have a capacity between 10-15.000 DWT, so they are quite small, because of fairway depths and harbor roadstead.

In order to reduce the cost, SC PETROMIDIA - SA intends to diversify the oil product provision and transport services. In this direction various feasibility studies regarding a buoy installation for heavy-duty ships unloading nearby Midia harbor area have been elaborated.



Navodari

Obiectiv

Ovidiu



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CURRENT SITUATION





BASIC CONDITIONS TO BE MET FOR THE TRANSFER POINT INSTALLATION

Basic criteria required for terminal installation

These criteria are referring to:

> Operational conditions for unloading ships :

-minimum water depth in area: 22,0 m; optimum depth 24,0m.

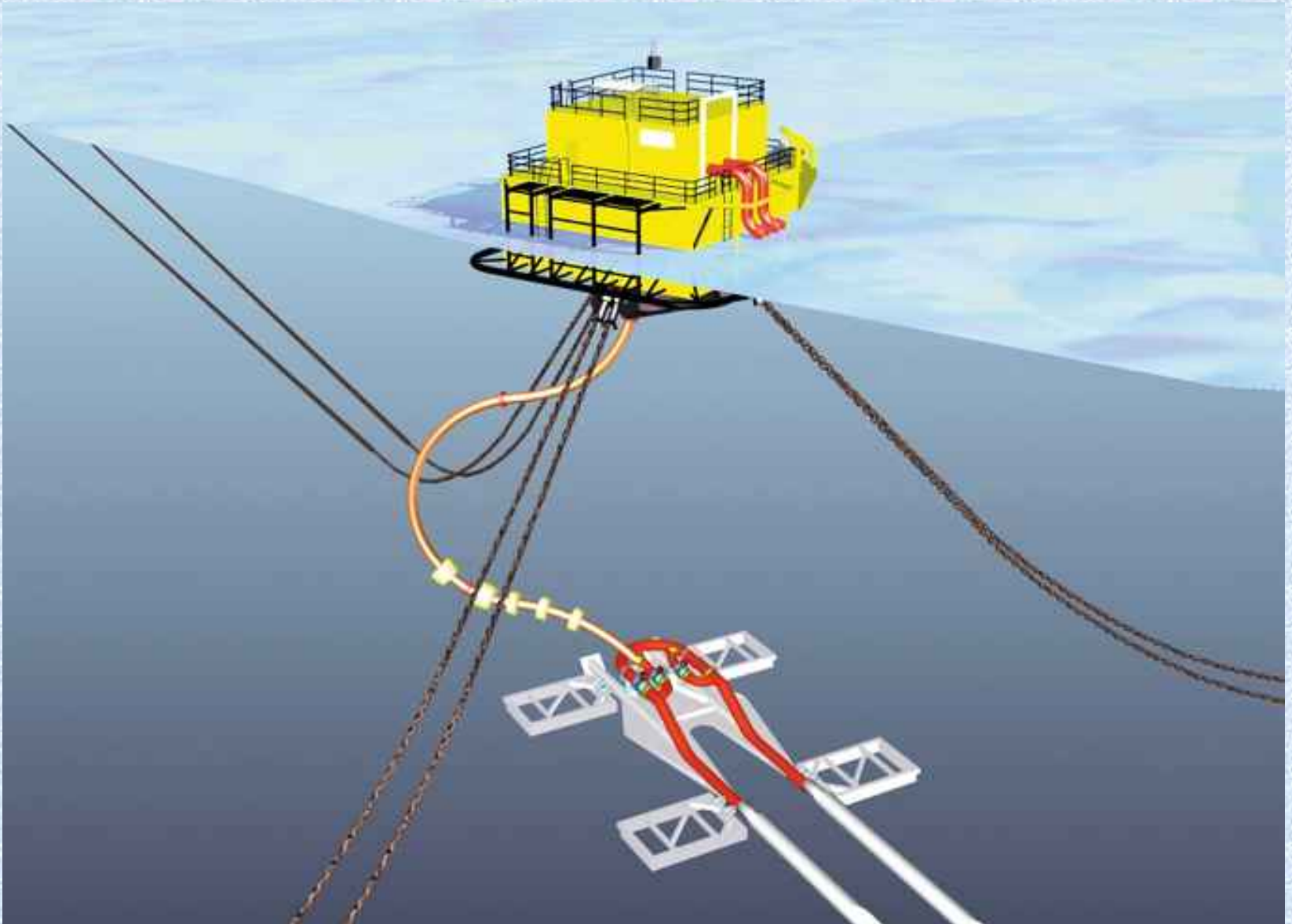
-ships should be able to anchor at the buoy up to sea agitation with waves no higher than 2 m;

-oil ships operating at the buoy should be admitted up to a sea agitation with waves no higher than 3,0 m, and wind speeds of 10,0 m/ sec. depending on the sea situation forecast. From case to case, it is necessary to clear out a ship from the berth area which will be establish by the specialized authorities.

-surrounding air temperature: min. -20°C, max, + 30°C.

-berth could be admitted until waves with a maximum height 4,5m.

TERMINAL SHORT DESCRIPTION, COMPOUND ELEMENTS

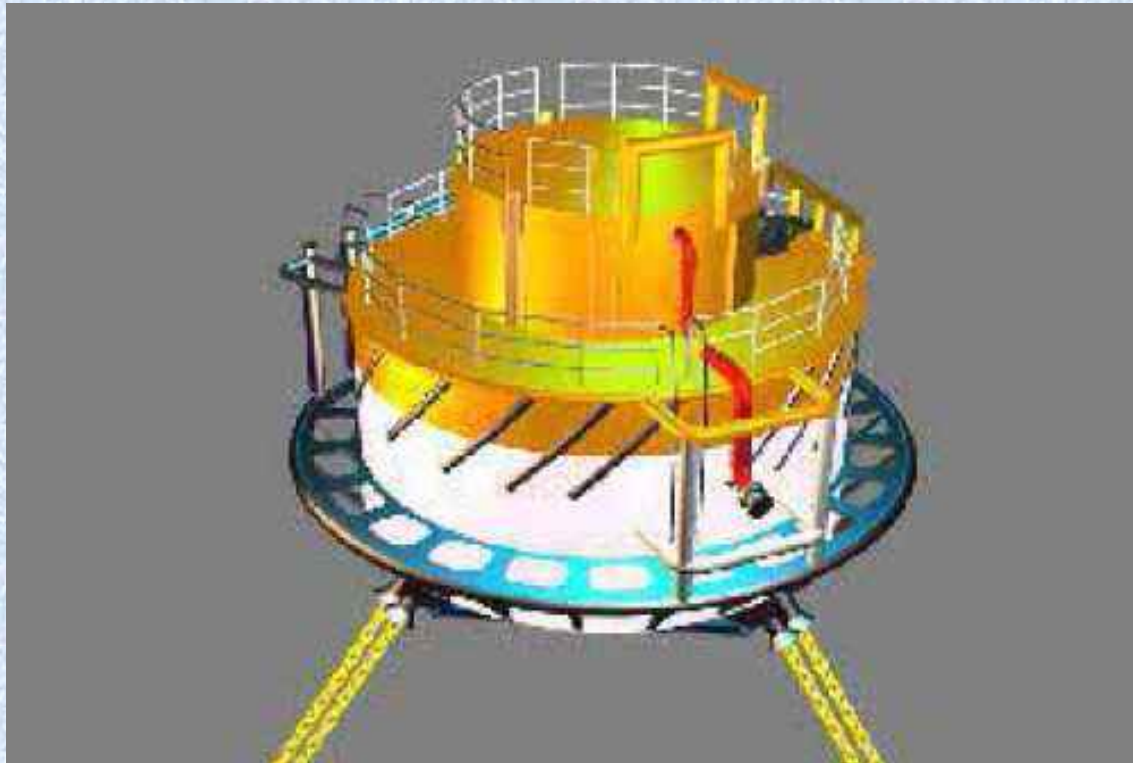


To initiate the proposed activities under optimum conditions the following main components are necessary:

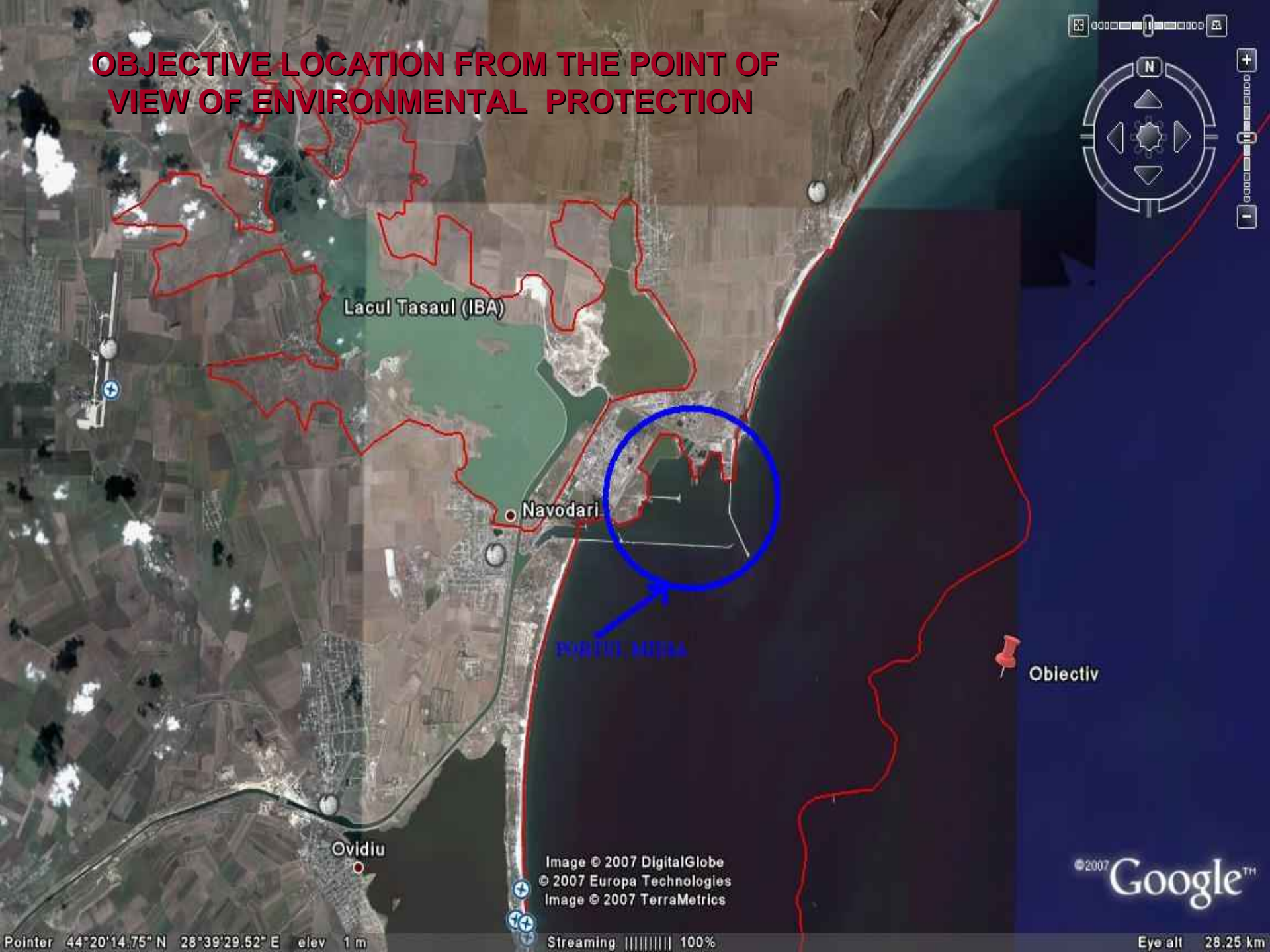
The buoy located ca. 8,5 KM offshore, at which oil tankers up to a weight of 165.000 DWT will operate. The terminal will be connected to a pipeline of Ø1000 mm the ends of which will be fitted with closure valves. The buoy will be constructed in such a way that it will have enough buoyancy reserve to remain in floating under any of the stated conditions. The buoy anchorage system will be designed in such a way, so as to assure safety in the conditions generated by a heavy storm.

The buoy will be moored into position aided by chains the length of which depends on the depth of the water where the buoy is located. Chains length will allow for buoy movement in a horizontal and vertical level, as much as necessary to prevent interference by the waves. Generally, depending on the buoy size, mooring is achieved by four or six chains. The chains are attached to the sea bed through so called „dead resisters“, which can be built in the shape of anchors or as large size concrete blocks. There are known cases when in cliff areas chains were attached through special mechanisms to the stone area inside the sea.

The tower buoy consist of two main structural components: The tower structure (the geo-static part) and the buoy body (rotational part). The tower structure is located in the central buoy sector and connected to the buoy at deck level with a pivot mounting featuring a ball bearing. Connection between the tower pipeline sections and the buoy body is made through a rotating joint which also has a ball bearing. Tanker Ships anchor to the buoy body by means of a steel cable and could, in response to the meteorological changes, rotate together with the buoy body around the tower.



OBJECTIVE LOCATION FROM THE POINT OF VIEW OF ENVIRONMENTAL PROTECTION



Lacul Tasaul (IBA)

Navodari

Ovidiu

POZIȚIA AȘTEIA

Obiectiv

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Pointer 44°20'14.75" N 28°39'29.52" E elev 1 m

Streaming ||||| 100%

Eye alt 28.25 km

LOCAL BIO-DIVERSITY

The objective in the form of a floating buoy terminal , is located in Constanta County, approximately 8,5 KM offshore, on the north side of the Midia Harbor sealane, at the interior limit of Midia Cape – Singol Cape sea coast subdivision .

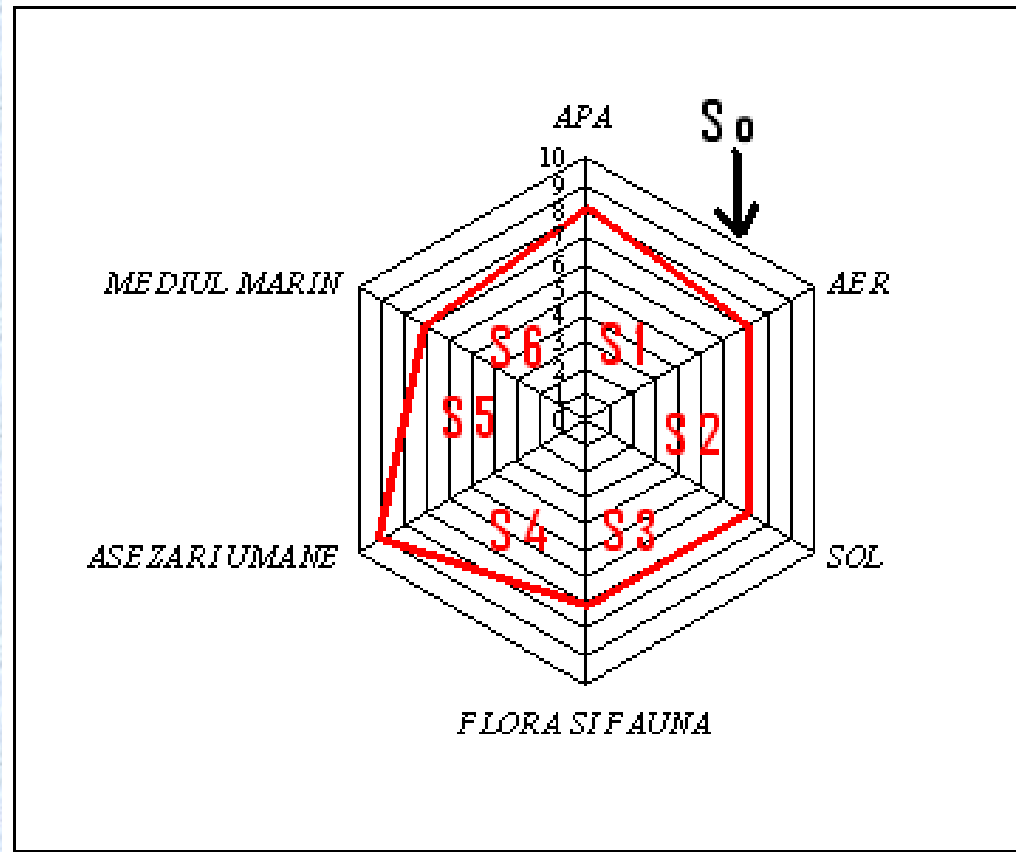
Local bio-diversity is crucially influenced by the confluence between many natural and human factors , such as:

- breakwater dikes;**
- Danubian sweet water infusion and biological residue coming through Midia-Navodari Channel;**
- the entire Midia-Navodari Channel construction;**
- the area's industrial character;**
- the presence of Midia commercial Harbor.**

In the studied area, to the distance of 8,585 km offshore the sea depth is 23 m. In order to establish the organic species which inhabit the discussed area, substratum consistency should be analyzed, this being characterized (at 23m depth) by the mixture between the sands and silt.

Considering the fact that the buoy layout area and the transport system is located near Midia commercial Harbor, special mention should be made to the possible existence of a variety of different sediments. Named harbor silts, thesed have a greasy characteristic, blue-black, and are rich in organic substances (saprogenic), most of the times featuring a strong smell of hydrogen sulfide.

ESTIMATION OF THE GLOBAL POLLUTION VALUE



The Global Pollution Value is $IPG = 1,77$ which shows that the environment is submitted to human activity in reasonable limits; however experts consider that at least hypothetically there is a risk of an accident causing major pollution.

RECOMMENDATIONS

- For fine tuning the studied activity's impact on the environment, it is recommended that for both the construction and operation of the studied objective the environmental impact is closely monitored. This way gathered information can be constantly accessed, in relation to the equipment status and accomplishment of intervention scenarios to reduce and eliminate effects in the case of accidental pollution.
- Study of the possibility to create an intervention fleet to fight accidental pollution with hydrocarbons.
- Stockpiling absorbent materials, to fight pollution, like floating dams for the open sea, and absorbing systems for polluting agent at sea level (SKIMMER) etc.
- Creation of computer simulation scenarios on accidental pollutions to include all the situations that could occur:
 - polluting agent nature (oil, diesel fuel, petrol etc.)
 - wave level
 - area water currents
 - wind force
 - wind direction
 - temperature
 - other necessary agents to be taken into consideration
- Accomplishment of a long term study (2-3 years) on the entire marine biological system, starting at the time when the objective is put into operation. This method could determine possible changes and effects on the area.

MAJOR CONCLUSIONS

After the analysis of the buoy operation system for oil tankers with a maximum of 165.000 dwt under characteristic Black Sea hydro meteorological conditions and after evaluating the impact on the environment we can make the following appreciations:

- under normal operational demands, following all the national and international instructions and regulations concerning this type of activity, the *buoy operation system for oil tankers of 165.000 dwt* , presents a safe system;
- due to specific hydro meteorological conditions in the area of the objective (storms with wind and heavy waves), *failure risks inside the system can appear only in the case of non-compliance with operating instructions;*
- a major impact on the environment could result only in extreme situations / disasters, e.g. through an oil tanker shipwreck with unfavorable maritime currents *a pollution of the Romanian sea coast with oil products could result;*

- a reduced impact on the environment could occur in case of accidental leaks due to the breakage of flexible floating bindings between the ship and the buoy or between the buoy and the submarine pipelines. Also, accidental pollution could result from cracks in the submerged pipelines through corrosion or fabrication faults;
- through the proposed measures and recommendations during operation, we believe that this impact on the maritime environment could be reduced to a minimum;
- considering that this type of operational system is a novelty in our country, it is absolutely necessary to strictly adhere to all the national and international measures and recommendations during the system projection, construction, exploitation and endowment activities, as well as environmental protection;
- worldwide there are hundreds of this kind of operational system and practically no major incident has been recorded so far. From Romanian experience, failures of PETROMAR Constanta submarine pipelines, in a time period of over 20 years were insignificant.

RECOMMENDATION

- Accomplish a risk study regarding any potential maritime environment pollution with hydrocarbons;
- Study the possibility to found an “intervention company” against maritime environment accidental pollutions. This would create the possibility for initial intervention on the so called “continental platforms” of the Ukraine, Bulgaria and Romania. The possible extension into deep sea waters of the Black Sea in a time frame of max. 3 – 5 should follow.
- Accomplish a study on the buoy location area.

After these conclusions, it is proposed to issue an Environmental Agreement for the objective: „Ships operating on buoy in Midia Harbour Area”.