

POTENTIAL AND CAUSES OF ACCIDENTAL OIL SPILLS IN THE RED SEA AND GULF OF ADEN: 1974-1986, A REVIEW.

HASSAN AWAD

Dept. Oceanogr., Fac. Sci., Univers. Alex., Moharram Bek,
Alexandria, Egypt.

Potential of both accidental and intentional oil spills in the Red Sea area should normally reflect the highly petroleum activities and oil transportation density in it. In fact, there is nearly a total absence of data for the rates of accidents spilling oils in the Red Sea and Gulf of Aden. The accidents included in Table 1, provided by ITOFF, are the only information which could be obtained for the precedent 12 years. All other efforts for gathering information related to this subject were often without reply or the information were forbidden to be provided.

Comparing the recorded number of accidental oil spills in the Red Sea (Table 1) with those in the Mediterranean (8 times more in surface area, 330×10^3 tons of oil are crossing annually), 45 accidents in the Red Sea were recorded during 12 years against 44 ones in the Mediterranean during 3 years (1983-1985) spilled about 25000 tons of oil yearly (Anon., 1986). However, the modest number of oil accidents noted in the Red Sea which transports about 650 mta of oil (Winnik and Nelson - Smith, 1979), seems to be an unreal figure and many other spills were not recorded. In fact, during the last decade, the mode of crude oil transportation from its fields in the Arabian Gulf to its consumers in Europe and U.S.A. by tankers across the Red Sea have been changed.

Actually while the majority of produced crude oils in the region is transported across high capacity pipelines, there are no available precise information about the operational oil spills around the areas of the terminals in the Red Sea. These actually functioned oil terminals are:

- Petroline loading terminal, from Arabian Gulf to the Red Sea at Yanbu in Saudi Arabia (180 mta).
- Hodida loading terminal, from N. Yemen oil fields to Red Sea at Hodida (10 mta).
- SUMED deloading terminal, at Ras Shokeir in Gulf of Suez to Mediterranean Sea.
- Eilat deloading terminal, at Eilat in Gulf of Aqaba (25 mta).

The only available estimation is for the terminal of Eilat-Mediterranean pipeline in the Gulf of Aqaba. In this area, 92 accidental oil spills had been occurred during 3 years (1969-1973) spilled about 100 tons of oil annually (Dixon and Dixon, 1975). However, oil spillage potential possibly existing around the areas of the other pipelines terminals in the Red Sea could be predicted by comparing the capacity of Eilat's terminal with those of the others.

TABLE 1
Oil spills in the Red Sea and Gulf of Aden area (1974-1986)
(after International Tanker Owners Pollution Federation Ltd, London, May 1987).

Date	Country	Oil type	Oil amount bbls	Operate	Cause	Date	Country	Oil type	Oil amount bbls	operate	Cause
1974	S. Arabia	A	B	?	D	1980	S. Arabia	?	?	?	?
"	S. Yemen	E	A	D	?	"	"	B	?	B	C
"	"	?	?	E	"	"	"	A	E(70)	C	?
"	"	G	C	A	C	"	S. Yemen	?	?	?	?
"	"	?	?	?	E	1981	Sudan	E	C(5)	B	B
"	"	A	?	A	B	"	Egypt	A	D(6)	A	B
"	S. Arabia	D	E(2250)	?	?	"	"	A	C(1)	D	A
"	Sudan	A	A	E	C	1982	S. Arabia	B	?	A	?
"	S. Yemen	E	D	?	?	"	"	A	C(2)	C	B
"	Sudan	E	A	D	B	"	"	A	D(40)	C	B
"	S. Yemen	E	B	C	C	"	"	A	D(10)	A	B
"	"	E	C	A	C	"	Somal	A	?	D	B
1975	"	?	?	?	?	"	Egypt	A	E(2000)	K	?
"	"	H	r	"	A	1983	"	A	E(11700)	J	?
"	"	E	C	A	C	"	S. Arabia	E	?	C	?
"	"	?	?	?	E	"	"	H	?	J	A
1976	S. Arabia	A	B	A	B	"	"	?	?	?	?
1978	S. Yemen	D	?	J	?	1984	N. Yemen	B	?	J	?
"	S. Arabia	C	A	C	D	1985	S. Arabia	?	?	C	?
"	N. Yemen	B	?	F	B	"	"	?	?	?	?
1979	Egypt	?	?	?	?	"	"	A	?	A	?
"	S. Yemen	F	B	C	?	1986	"	A	D	C	B(1)
1980	"	?	?	?	?						

Legends for Table

SPILTYPE (type of oil)

- A crude
- B bunker
- C bilges
- D fuel (cargo)
- E white prod.
- F tank washing
- G lube oil
- H bitumen

SPILOPER (operation in progress)

- A loading
- B bunkering
- C deballasting
- D discharging
- E ballasting
- F bilge pumping
- G tank cleaning
- H intern trans.
- J strand/grndg
- K collision
- U unknown

SPILCAUS (cause of spill)

- A hull failure
- B equip. failure
- C human error
- D hull defect.
- E fire/explos.
- U unknown

Using the limited data grouped in Table 1, distributions and frequencies of recorded oil spills in the Red Sea area are represented in Fig. 1, while statistical analysis is shown in Fig. 2 for the accidental oil spills, causes and operations. From these figures, it could be clearly concluded the following statements:

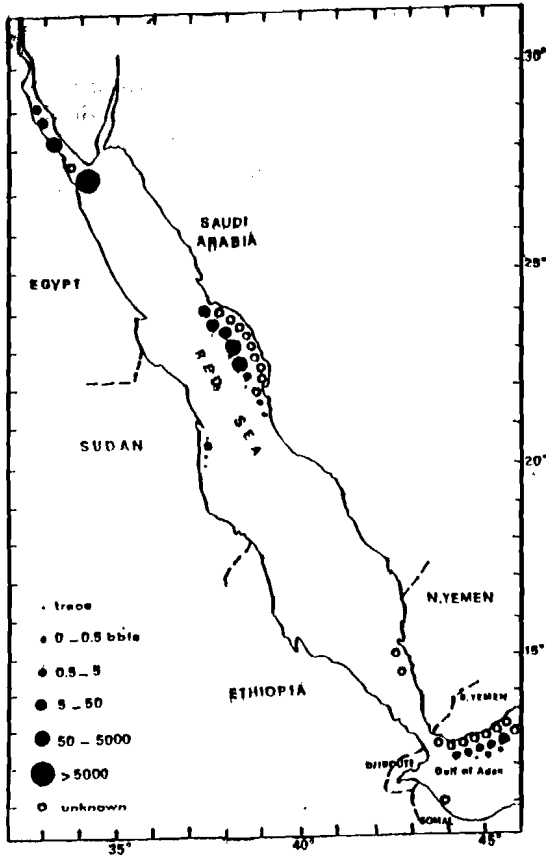


FIG. 1
 Repartition of accidental oil spills along the Red Sea and
 Gulf of Aden coasts (1974-1986).

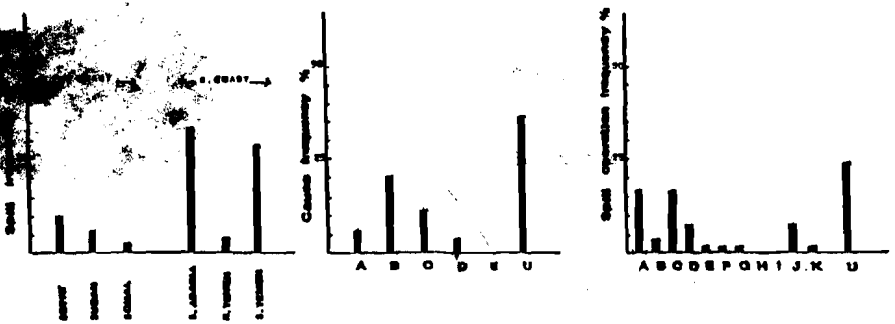


FIG. 2
 Frequencies of positions, causes and operations of accidental oil spilled
 in Red Sea and Gulf of Aden (1974-1986).
 (for symbols, see legends in Table 1).

1) Frequencies of accidental oil spills near the eastern coast of the Red Sea (where the main navigation route is not far away) are largely higher than these near the western one. In fact, the highest dissolved oil concentrations in the Red Sea surface waters were found along eastern coast especially off the deserts area of the Saudi Arabia coast (Awad, in press).

2) The coastal waters of S. Yemen in the Gulf of Aden are subjected to nearly the same number of accidental oil spills as in front of the eastern coast of the Red Sea but at relatively lower spilled amounts.

3) Although of the limited number of spills recorded in the Egyptian Red Sea coasts, the relatively largest oil amounts were spilled in this area.

4) Equipment failures followed by the human errors are the main causes of accidental oil spills in the Red Sea area.

5) Accidental oil spills are frequently occurred during crude oil loading and tankers deballasting operations.

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