EVALUATION OF THE EXISTING PIRACY PROTECTIVE MEASURES

Josip Kasum, Sc. D., Proffesor
Faculty of Maritime Studies in Split
Zrinsko-Frankopanska 38
21000 Split
jkasum@pfst.hr
++38591-380-6996

Krešimir Baljak, master mariner
Faculty of Maritime Studies in Split
Zrinsko-Frankopanska 38
21000 Split
kbaljak@pfst.hr
++38591-380-7024

Pero Vidan, master mariner
Faculty of Maritime Studies in Split
Zrinsko-Frankopanska 38
21000 Split
pvidan@pfst.hr
++38591-380-7004

ABSTRACT

Piracy consists of various forms of organised piracy activities directed against the ship, aiming at unrighteous acquisition of material and/or financial assets. In the worst cases the results of piracy are human casualties, and, very frequently, the loss of cargo. This paper discusses the impact of acts of piracy closely connected to the selection of navigational routes and to the safety of navigation. It presents piracy threatened areas in the world. Comparable areas are subject to a comparative analysis. This paper gives the evaluation of piracy areas and suggests their classification. It is assumed that suggested classification will allow for the evaluation of the existing piracy protection measures.

Key words: piracy, safety of navigation, protection measures, threats evaluation, classification.

1. INTRODUCTION

Piracy is a minor form of organised activities directed against the ship aiming at unrighteous acquisition of material and/or financial assets, which has been legally defined in the UN Convention

on law on the sea. The Convention advises all signatory countries the highest cooperation in preventing piracy in the open sea or any other place which is not under the jurisdiction of any State. According to the Convention, piracy is any illegal act of violence, detention or robbery, committed for private ends by the crew or the passengers of a private ship or a private aircraft, and directed on the high seas against another ship or aircraft, or against persons or property on board such ship or aircraft against a ship, aircraft, persons or property in a place outside the jurisdiction of any State, any act of voluntary participation in the operation of a ship or of an aircraft with knowledge of facts making it a pirate ship or aircraft, and any act of inciting or of intentionally facilitating a piracy act.

Piracy activities affect the selection of navigational routes. When selecting navigational routes all statistical indicators about piracy acts need to be considered and the areas of occurrence based on them. If the selected route passes through the piracy threatened area, the itinerary route should be changed.

If possible, the route in the piracy threatened area should be replaced by a new route in a safe area. If it is not possible preparatory measures preventing the piracy attacks need to be undertaken. There are no legally determined activities to be respected which are aimed at safe navigation along piracy threatened areas [1] [2]. The measures which are undertaken by the crew come only to increasing the number of anti-piracy watch, closing the superstructure and preparing fire monitors as the last medium to prevent pirates from boarding the ship.

The existing anti-piracy measures are considered insufficient and indicate the need to implement new protective measures. It is therefore necessary to conduct a comparative analysis of piracy threatened areas.

2. THEORY AND METHOD

The International Chamber of Commence – ICC has recognised piracy as a threat to maritime affairs and established The International Maritime Bureau – IMB whose task is to collect and exchange data about any kind of piracy acts [3]. Due to the increased piracy threat, the ICC IMB founded in 1992 the *Piracy Reporting Centre – PRC* in Kuala Lumpur, whose role is to collect, analyse and dispatch data about piracy acts. PRC has statistical figures for attempted attacks and actual attacks at various kinds of ships, and relates them in time and space [3].

On the basis of statistical data it is possible to do a comparative analysis of:
- Current piracy threat areas,
- Efficiency of the existing anti-piracy protective measures, and
- Threats to particular kinds of ships.

Time and space framework of the recorded attacks allows defining the current piracy threats areas (Table 2).

Efficiency of the current anti-piracy protective measures may be determined by analysing the successful defence against attacks (Table 2). Efficiency of defence against attacks is the ratio between the number of failed attempts and the total number of attacks to ships, if we assume that failed attacks are the result of successful defence. It can be determined by the following formula:

$$P_{DEF} = \frac{N_{ATTEMPTED}}{N_{TOTAL}} \cdot 100 \qquad (1),$$

Where:

- P_{DEF} - percentage of successful defence against piracy attacks (%),
- $N_{ATTEMPTED}$ - the number of failed attacks, and
- N_{TOTAL} - total number of attacks.

Table 1 World-wide piracy activities 1994-2005

Source: http//www.icc-ccs.org, *Piracy and armed robbery against ships report for the period 1st January – 30th September 2006,* ICC International Maritime Bureau, Kuala Lumpur, 2006.
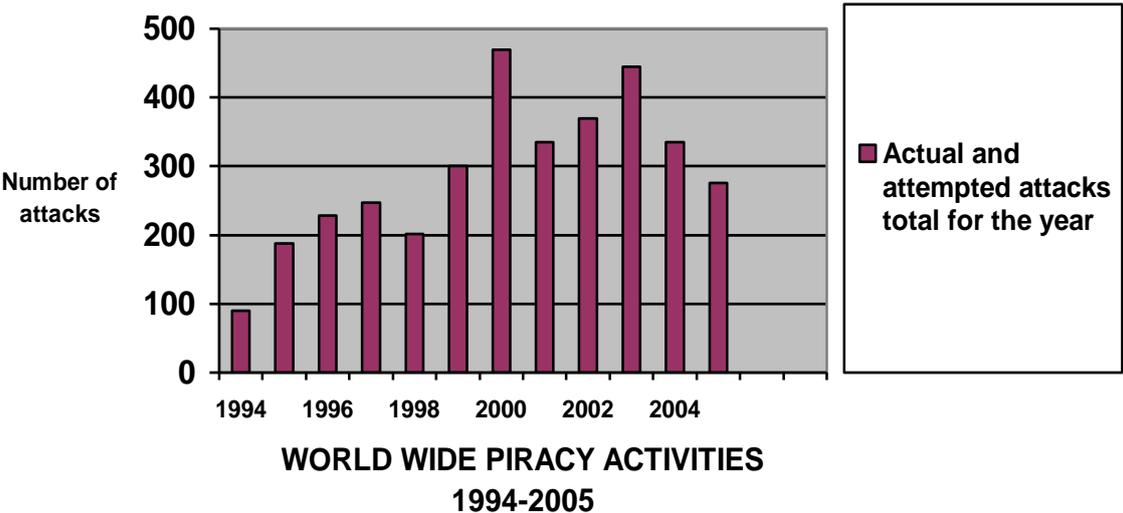
The threats for particular kinds of ships may be determined by the data analysis presented in Table 4.

3. RESULTS

Presentation of the areas of piracy acts in Table 2 is the result of several-years statistical records [3].

Table 2 Actual and attempted attacks by locations, January to September 2006

Source: http//www.icc-ccs.org, *Piracy and armed robbery against ships report for the period 1*[st] *January – 30*[th] *September 2006,* ICC International Maritime Bureau, Kuala Lumpur, 2006.

LOCATIONS		ACTUAL ATTACKS				ATTEMPTED ATTACKS	
		Boarded	Hijacked	Detained	Missing	Fired upon	Attempted
SOUTH EAST ASIA	Indonesia	27	2				11
	Malaysia	8	1				
	Malacca Straits	6				1	1
	Philippines	2	1				
	Singapore Straits	1					2
	Thailand		1				
FAR EAST	China	1					
	South China Sea	1					
	Vietnam	3					
INDIAN	Bangladesh	22					11
SUB CONTINENT	India	2	2				
AMERICAS	Brazil	5					1
	Colombia	1					1
	Ecuador	1					
	Guyana	1					
	Haiti						
	Jamaica	1					2
	Peru	6					
	Venezuela	2					
AFRICA	Angola	2					
	Cameroon	1					
	Congo	3					
	Ghana	1					
	Guinea	2					1
	Gulf of Aden / Red Sea	1					8
	Ivory Coast	1					
	Madagascar						
	Morocco						
	Mauritania						1
	Nigeria	6					3
	Sierra Leone	2					
	Somalia		4			4	
	Tanzania	2					
REST OF WORLD	Arabian Sea					1	
	Belgium	1					
	Iran						1
	Iraq	1					1
	Sub total	113	11			6	44
	Total for nine months			174			

Several piracy hotspots are located in south-eastern Asia and Indian subcontinent [3]:

- Indonesia,
- Malaysia,
- Malacca Straits, and
- Singapore Straits.

In Africa and the Red Sea the centres of piracy activities are [3]:
- West Africa (Nigeria),
- Gulf of Aden and Red Sea, and
- Somalian waters

The centres of piracy in Central and South America are [3]:
- Brazil,
- Peru, and
- Venezuela

According to the data in Table 2 it may be concluded that $N_{ATTEMPTED} = 50$ and $N_{TOTAL} = 174$. According to the formula (1), the percentage of successful defence against piracy for the period January – September 2006 is $P_{DEF} = 34,80\%$.

Table 3 Comparison of the type of attacks, January to September 1994 – 2006

Source: http//www.icc-ccs.org, *Piracy and armed robbery against ships report for the period 1st January – 30th September 2006,* ICC International Maritime Bureau, Kuala Lumpur, 2006.

Category	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Attempted boarding	17	23	28	10	22	22	78	61	54	76	56	38	44
Fired Upon		9	4	24	7	8	6	8	10	17	9	15	6
Ship boarded	37	93	134	134	100	141	202	166	184	235	177	141	113
Hijacked	5	15	4	12	13	6	6	15	20	15	9	11	11
Detained	6	5		4	1	1	1	1				-	-
Missing						2	1	2	3	1		-	-
Not Stated	4			2								-	-
Sub total, Jan to Sept.	69	145	170	186	143	180	294	253	271	344	251	205	174
Total at year end	90	188	228	247	202	300	469	335	370	445	335	276	

According to the data about the type of the attacks for the period 1994–2006 a several-year percentage of successful defence against piracy may be calculated. The numbers of failed attacks are attempted boarding and attempted boarding fired upon, which for the observed period are $N_{ATTEMPTED} = 652$ attacks. The total number of attacks in the period January – September 1994-2006

is $N_{TOTAL} = 2685$ attacks. Hence, according to the formula (1), the percentage of successful defence against piracy is $P_{DEF} = 24,28\%$.

Table 4 Types of ships attacked, January to September 1994 – 2006

Source: http//www.icc-ccs.org, *Piracy and armed robbery against ships report for the period 1st January – 30th September 2006,* ICC International Maritime Bureau, Kuala Lumpur, 2006.

Type	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Barge/Barge carrier				3	1	1	1	2	2	2	1	2	
Bulk carrier	12	24	32	30	27	49	84	52	64	94	52	57	39
Catamaran											1	1	
Cable Layer Ship										1		1	
Cement carrier											1		
Coast guard ship				2									
Combination carrier			1										
Container	14	17	19	28	16	27	48	50	19	48	37	24	37
Diving supportVessel											1		
Dhow													2
Dredger				1				1	2				
Ferry		2	3	5		2				2			
Fishing / Trawler	1	3	19	7	6	1	4	14	13	19	18	3	15
General cargo	19	33	31	34	33	27	47	40	70	58	31	33	19
Heavy lift			1				1						
Hopper Dredger													1
Landing Craft											2		2
Lighterage ship		2											
Livestock carrier		2				1	1		1		2		
Log carrier		1	1	1		1	1	1					
Multipurpose		2					1	3					
OBO				1					1	2			
Offshore ProcessingShip												1	
Offshore barge													1
Passenger		1		1	1				1	1			2
Pollution control													1
Refrigerated	2		1	2	4	6	5	1	5	4	5	3	2
Research ship							1	1					
RORO	1	2	1	1		3	5	4	4	4	2	4	1
Special Purpose Ship									2	1			
Storage Ship													
Supply Ship			1			1	2	2	1	4	7		1
Survey Ship										2			
Tanker Chem./ Product	1	2	13	2	5	12	12	15	17	33	44	36	25
Tanker Crude Oil	10	18	16	20	19	36	56	43	37	31	15	16	6
Tanker LNG	1	2	1	4	2								
Tanker LPG	4	6	9	5	4	4	9	6	11	12	8	2	2
Tug	1	8	4	3	2	2	3	5	6	16	13	12	9
Vehicle carrier	2						1				1	2	1
Warship							1						
Yacht /Speedboat		1	3	8	1	3	5	9	5	10	9	5	8
Not stated	1	5	14	24	22	4	6	4	10		1	3	
Sub total, Jan to Sept.	69	131	170	182	143	180	294	253	271	344	251	205	174
Total at year end	90	188	228	247	202	300	469	335	370	445	335	276	

According to the data presented in Table 4 the most threatened types of ships are:

- bulk carriers,
- container vessels,
- general cargo vessels,
- crude oil tankers, and
- tugs.

4. DISCUSSION

It is assumed that the performed analysis of the areas of piracy allows the evaluation of the existing piracy protective measures. It is therefore proposed to determine the acceptability of piracy protective measures on the basis of the risk matrix, which enables the evalouation of risk in general.

The risk is the product of frequency and consequences [4]. The frequency is determined by the number of attacks in the piracy threatened area. The consequences are expressed by the value of the seized goods, damages to the ship and cargo, and human lives, and it is assumed that may be directly related to the probability of successful defence against piracy P_{DEF}.

Main principles for producing a risk matrix are [4]:

- frequency of attacks is determined as low, low to medium, medium to high and high,
- consequences of the attack are determined as slight, border, critical and catastrophic,
- the risk may be acceptable (A), border (B) and unacceptable (U).

Table 5 Risk matrix

<table>
<tr><td rowspan="4" style="writing-mode: vertical-lr">FREQUENCY OF ATTACKS</td><td>HIGH</td><td>A</td><td>B</td><td>U</td><td>U</td></tr>
<tr><td>MEDIUM-HIGH</td><td>A</td><td>B</td><td>U</td><td>U</td></tr>
<tr><td>LOW-MEDIUM</td><td>A</td><td>A</td><td>B</td><td>U</td></tr>
<tr><td>LOW</td><td>A</td><td>A</td><td>A</td><td>A</td></tr>
<tr><td></td><td></td><td>SLIGHT
$75\% \le P_{DEF} \le 100\%$</td><td>BORDER
$50\% \le P_{DEF} \le 75\%$</td><td>CRITICAL
$25\% \le P_{DEF} \le 50\%$</td><td>CATASTROPHIC
$0\% \le P_{DEF} \le 25\%$</td></tr>
<tr><td></td><td></td><td colspan="4">CONSEQUENCE</td></tr>
</table>

It is assumed that the presented risk matrix may be used for evaluating the current protective measures against piracy. The state in which the existing protective measures against piracy are accepted (A) refer to:

- high percentage of successful defence against attacks ($75\% \le P_{DEF} \le 100\%$) in all frequency groups,
- considerable percentage of successful defence against attacks ($50\% \le P_{DEF} \le 75\%$) at low and low to medium frequency of attacks, and
- lower percentage of successful defence against attacks ($25\% \le P_{DEF} \le 50\%$) at low frequency of attacks.

For border and unacceptable state it is assumed that the existing measures are not sufficient and developing of new protection measures is proposed.

CONCLUSION

Current measures which are undertaken by the crew aimed at protecting from piracy refer to increasing of number of anti-piracy watch, closing the superstructure and preparing the fire monitor as the last defence against pirates entering the ship.

On the basis of the analysis conclusion can be made that current protective measures are not sufficient, since the percentage of successful defence against piracy for the period 1994 – 2006 is $P_{DEF} = 24{,}28\%$. According to the proposed groups of efficient defence against piracy attacks it may be concluded that the current state indicates the necessity to establish new protective measures.

New protective measures should allow for higher percentage of defence against piracy attacks, therefore future researches have to lead to that direction.

REFERENCES

[1] *Consolidated text of the International Convention for the Safety of Life at Sea, 1974, and its Protocol of 1988: articles, annexes and certificates*, IMO, London, 2004., (http//:www.imo.org)

[2] *International Ship and Port Facility Security Code*, 2003 Edition, IMO, London, 2003., (http//:www.imo.org)

[3] *Piracy and armed robbery against ships report for the period 1ˢᵗ January – 30ᵗʰ September 2006*, ICC International Maritime Bureau, Kuala Lumpur, 2006, (http//:www.icc-ccs.org)

[4] Kos, S.: *Nadzor i management sigurnosti u prometu*, Authorised lectures, Post graduate specialised studies, Faculty of Maritime Studies, Split, 2006.