ABSTRACT

Port of Gruž is located in a naturally protected bay which can accommodate the biggest passenger cruisers and RO-RO ships that sail the Mediterranean. At the same time there are more yachts visiting the port because of the vicinity of the Dubrovnik historic sites. The frequency of maritime traffic and other maritime services is rapidly increasing and sometimes causing overload in the summer months. The sizes of all kinds of ships and yachts that manoeuvre in the port are getting bigger. The itinerary for the following seasons and prognoses till 2010 stress the increase in the number of ships, vehicles and passengers. The activities at the passenger terminal are in progress at the moment and after completing all the works the passenger pier will be about 200m long with the depth of 12m. Handling of cruisers will therefore be much easier and more efficient. Another benefit for the bay will be the construction of the Yacht marina and marina for the local boats all along the south-west coast of the bay. Considering summer peaks in all kinds of traffic it is necessary to analyse the state of all relevant traffic factors and the density of traffic in order to organise safe and smooth flow of ships, vehicles and passengers through the port of Dubrovnik - Gruž.

KEY WORDS

Port of Gruž, cruisers, yachts, passengers, vehicles, traffic safety

1. INTRODUCTION

The Port of Gruž is located in a naturally protected bay which is opened to the north-west and closed to the south-east. The length of the bay is about 1600m with maximal width of 440m and the deepest point of about 29m. The bay is not exposed to high swells and gusts thus providing excellent shelter for all kind of ships. Secure anchorage and docking but also vicinity of the old city of Dubrovnik caused real boom of all kinds of maritime traffic in the last few years in the Port of Gruž. Hundreds thousands of passengers, hundreds of giant cruisers, thousands of yachts invade the port mostly in the summer months. Although the bay of Gruž does not seem to be very big, a lot of different activities take place on the sea and around the coastal facilities in the port. In summer when the port is heavily loaded there may be found passenger cruisers, ferry boats, tourist boats, yachts and local boats (Figure 1) varying in sizes and types.

Because of the very intensive maritime traffic through the port and relatively small manoeuvring area organisation of traffic and arrangement of port facilities need serious analysis. Very often all kinds of boats sail simultaneously in the restricted area of the bay and dangerously challenge the navigation safety.

2. PRESENT MARITIME TRAFFIC CONDITIONS IN THE PORT OF GRUŽ

In the last six years a real explosion occurred considering the increase of cruising passengers (Graph 1). The breakpoint happened in the year 2003 when the amount of passengers more than doubled compared to year 2002. An increasing trend is higher after 2003 than before that year.

There are 3 significant zones considering density and variety of sea traffic (Figure 2). It is remarkable...
that the size of ships which visit the bay is decreasing as the bay opens. Zone 1 is located at the beginning of the bay where all kinds of boats sail in and out. Within that zone the traffic load is the highest mainly because of big passenger cruisers that are allowed to dock only there. Zone 2 is less loaded but still big ferries interact with all other smaller boats. Within that zone ferries longer than 100 meters practice to turn the ship before docking. Pier closer to the entrance is dedicated mainly to international ferry boats while the rest is mostly occupied by yachts. Not long ago a collision of a big coastal ferry and a small local liner occurred in that zone with fatal consequences for the small boat. Zone 3 is used by small local boats and different excursion boats to the surrounding islands. There are around 300 local boats in the bay with no registered statistics about traffic of these boats.

International and domestic passenger traffic takes place throughout the year (Graph 4). It starts in January with just a few thousand passengers and then continuously increases till the month of August with the highest peak. After August the number of passengers rapidly decreases as the year comes to the end. The highest numbers of passengers occur in the summer months compared with the rest of the year. International traffic is higher than domestic traffic, especially in summer. At the beginning and at the end of the year the number of international passengers is not significantly higher than the number of domestic passengers.

From January to March both international and domestic passengers are numbered in a few thousands. From April the difference in numbers is higher, culminating in August with 196,170 international passengers and 88,680 domestic passengers.

International and domestic car-ferry traffic through the months of 2006 is presented in Graph 5. The distribution of cars is similar to the distribution of passengers. The summer months are much heavier loaded than other periods of the year. Extreme peaks are experienced in August when 2,721 cars arrive with domestic lines and as many as 6,594 cars come to Gruž by international ferries. In winter months the international and domestic car traffic is almost equal.

The only reliable prediction for the future time periods can be provided from the cruisers and ferry boats because they plan their time table at least one year ahead. With local boats and international yachts it is very difficult to manipulate with estimations because there are no advanced predictions about traffic of such boats.
Graph 6 presents the number of cruisers and the number of passengers visiting Dubrovnik according to the received itineraries from all cruising companies. The majority of ships (74%) booked docking in the port of Gruž instead of anchoring near the old city of Dubrovnik. The number of dockings in Gruž often increases because every time the south wind blows all ships anchored close to the old city move to the port of Gruž. All the presented numbers are significantly higher than in the former years (2000-2006) proving continuous increase of cruising industry in Dubrovnik and Gruž.
This analysis is important because of maritime and road traffic peaks caused by passenger cruisers. The highest peaks are on Wednesdays and Sundays. Wednesdays must be seriously considered in road traffic because it is a workday when local cars together with buses from the port cause road traffic congestion. Sundays, on the other hand; are non-working days when local people go out with their boats, thus causing sea traffic jams interfering with cruisers and other boats.

3. FUTURE MARITIME FACILITIES IN THE PORT OF GRUŽ

Considering the importance of cruisers, ferries and yachts for the future development of the port of Gruz as well as the needs of the local population and the increasing number of local small boats, the facilities within the port are supposed to be reorganised. The new arrangement of the port is presented in Figure 3. Zone a is close to the entrance and dedicated to the passenger cruisers. The pier that is right now under construction is going to be about 800 meters long and capable of docking the biggest cruisers in the world. Zone b will dock local liners together with passenger and ro-ro ships. Zone c will accommodate yachts, zone d excursion boats and zone e local small boats. The capacity of zone e is going to be about 550 boats making that area much more effective than before. The biggest area f is dedicated to marina with all the necessary yacht facilities including smaller sport and recreational part g.

4. TRENDS IN NEWBUILDINGS OF PASSENGER CRUISERS

Trends in newbuildings of passenger cruisers could simply be described by one statement originally from the company «Royal Caribbean». It says: “The bigger it is – the more cost effective it is”. Obviously, most of the cruising companies are building huge ships that are often more than 300 meters long, carrying thousands of passengers and crew. According to ISL Market Analysis from June 2005, out of 24 new buildings planned till the year 2009 even 14 cruisers are bigger than 100,000 gross tons. Three of them are going to be the biggest cruisers in the world with more than 150,000 GT.
5. CONCLUSION

Following the strategy of sustainable development and meeting the needs of local population, the planners of maritime activities in the port of Gruž should carefully consider every traffic issue in order to provide safe and reliable flow of all ships and boats within the bay. Every year there is more traffic in the port and the ships are getting bigger and bigger. Cruisers docking in the port look like small towns while bigger yachts are dimensioned like ships. Therefore, it is mandatory to organise and co-ordinate all the participants that are conducting any kind of maritime traffic in the port. The following measures have to be implemented urgently in order to comply with the safety standards:

- organising special service to co-ordinate all the activities around and within the port;
- providing stand-by tugs for the biggest passenger cruisers;
- prohibiting manoeuvring of two cruisers at a time;
- implementing “VTS” control;
- providing continuous watch and co-ordination from small pilot boats.

Co-ordination of traffic must include everyone, from the little local boats to the big ships with equal attention and care for safety.

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SAŽETAK

ANALIZA STANJA I GUSTOČE POMORSKOG PROMETA U LUCI DUBROVNIK - GRUŽ

Luka Gruž prirodno je zaštićena luka koja može primiti najveće cruisere i RO-RO brodove koji prometuju Mediteran. Istodobno, zbog atraktivnosti i blizine dubrovačke starije gradske jezgre, luku posjećuju sve više jahti. Frekvencija svih plovila i broj usluga koje se pružaju u luci uvećana se i u ljetnim mjesecima dovodi do napruženosti i posebno je to u skupnom akvatoriju. Najave pomorskog prometa za sljedeće godine i prognoze do 2010. godine ističu povećanje uplovljavanja brodova, broja putnika i broja voza. Za sezonu 2008. najavljen je zavrsetak radova na obali predviđenom za prihvat cruisera kojim se dobiva oko 800 m ravnice sa dubinom od oko 12 m uz znatno bolje mogućnosti prihvativanja. Također se planira izgradnja marine i lutnice za privez lokalnih brodova kojima bi se uredila jugozapadna obala guskuškog zaljeva.

IZVORI

[7] Uredba o uvjetima koje moraju udovoljavati luke, N. N. 22/95