Abstract: Almost every day close passage or near miss events happens in south part of Istanbul Strait between the vessel runs in the local area and pass strait transit. The vessels run in the local area pass close bow or aft of transit vessel or come close and wait for transit vessel because of inexperienced or incompetent skipper or because of time limitation or failure in technical equipment or lack of technical equipment or old equipment. This close passages create profound dangers for the surroundings. By the this research has been aimed to point out mentioned dangers by the concrete as number. For this purpose has been utilized JMS Ship Handling Simulator which has been settled in ITU Maritime Faculty and Environmental Stress Model which has been built up and improved in Inoue Laboratory. Has been simulated confronting situations of a vessel passing Istanbul Strait with running vessel in local area. The real situation has been put in the senarios which been played during simulation implementations by whom has ocean going officer license and sufficiency. The data files has been reached after simulation implementations transferred to the numerical risk occurred during passage of South Part of Istanbul Strait by the Environmental Stress Model. Thus so, the risk which Istanbul Strait face everyday has been expressed as numerical and concrete.

Keywords: Risk Analysis, Ship-handling Simulator, Traffic Survey, Marine Traffic Engineering, ES Model
Istanbul Strait

Istanbul Strait which has national and international dense maritime traffic involving with shipping, fishing, military, tourism, and environmental safety. Istanbul Strait is a dangerous area with its metal structure and navigation difficulties. Istanbul Strait has a structure with high-impact sea navigation with traffic to be maintained by a large wind current; low visibility, ice, and slow water.

Istanbul Strait Maritime Traffic

The average passage of vessels from strait per year was 25,000 at 1935 when has been signed Montreux Agreement. Nowadays, this figure reached to 350,000 per year. Being opened for trading:

- Maritime transportation has lower cost expenditure and more convenient for transportation
- Collapse of USSR and new EU countries open their doors to world
- Hazard Petroleum has opened to international directory
- Ship construction technology has been

Istanbul Strait Local Marine Traffic

- Daily 55 transit
- Daily 20 oil tanker passage
- Estimated daily 40 tanker passage for proceeding 10 years is 300 tanker

Some Accidents lived at Istanbul Strait

- A marine accident which could occur result of this high tanker traffic can give catastrophic damage to historical and nature environment of Istanbul. This damage could be more effective than rumored earthquake of Istanbul
- Lets look at some has been lived accidents at Istanbul Strait
Some Accidents lived at Istanbul

Necessity of Local Traffic Management at Istanbul Strait South Entrance Area

Collisions

Environmental Stress Model

Condition of Vessel pass from Istanbul Strait

Marine Traffic Environment

Collision occurred at Istanbul Strait

Between 1991 - 2005

Collisions at Istanbul Strait

Research Area

Other Area

Environmental Stress Model

Marine Traffic Environment

Research Area is between Marmara to Barıköy line and Bosphorus

Length: Approximately 2.5 miles distance

There is one big container and cargo port and one big passenger terminal

Traffic Flow in the area

North-South

South-North transport vessel

West-East

East-West crossing

Local Traffic

Small vessels

Conventional ships

Lightering and Recreational Boats

Fishing Boats
ES Model

Research Steps
- Creation of two scenarios
- Navigation of Ocean-going masters and officers at created scenarios
- Analysis of results of navigation at ES Model
- Converting result of ES Model analysis to graphics
- Interpretation of analysis

Creation of Scenario
- Determination of local traffic time and time schedule
- Determination of composite time of local traffic
- Determination of navigation area at scenario
- Determination of general route of transit and local vessels
- Determination of own site
- Creation of Scenario

Creation of Scenario
- Local Traffic at Istanbul Strait South Entrance

Creation of Scenario
- Determination of general route of transit and local vessels

Creation of Scenario
- Number of colliisions
Scenario Implementation

An example of result of ES model converted to graphic

Analysis of results of navigation at ES model

Determined Risky Area for Istanbul Strait South Entrance

Result of ES model Implementations

Conclusion

- Most risky area at Istanbul Strait south entrance is between Saray Burnu and Haydarpaşa Breakwater.
- This risky area is sector transfer line of VTS.
- Local traffic should be rearranged to reduce risks in the area.