Risk-management in European Transport/
Logistical System involving both EU and non-EU Member State

Lecture 2

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External and internal threats for transport activities

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Lecture Motto:
Safety and security are far more than ticket to business
Two initial assumptions
Assumption 1:

Transport is a complex system generating numerous critical problems.

Environment:
- Market,
- Navigation;
- Law, itp.

1. Vehicles
2. Staff
3. Infrastructure

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Assumption 2:

The successful operation of transport system depend from ratio hazards and safety factors.
Critical problems for transportation
The first problem: Operational Hazards
Accident chain
Disruptive Factors (Threats) as Sources of Accident Chain

**Navigation conditions**
- Strong wind;
- Heavy waves;
- Currents;
- Ice, etc.

**Technical**
- Level of corrosion;
- Strength properties;
- Reliability,

**Threats**
1. Heavy navigation conditions
2. Technical / Engineering
3. Human Factor etc.

**Engineering**
- Size vessel;
- Subsystems incompatibility;
- Engine / installation damage etc.

**Human Factor**
- Everyday routine / fatigue;
- Skill-based errors;
- Military operations;
- Passengers phobias;
- False information;
- Terrorism / Piracy;
- Commercial crime etc.

**Accident chain**

**Consequences: damage, crash, wreck, etc.**
- Hull destroy;
- Collisions/allision;
- Explosion / Fair;
- Grounding etc.

- Crew & Passengers injured / dead;
- Waterway closure;
- Environment pollution;
- Cargo / property damage, etc.

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Everyday routine ⇒ hazard activation

Initial

disruptive

factors

Critical incident

Failure as Set of Retrievable Damages

Crewmember negligence and errors

Catastrophe as Set of Irretrievable Damages

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Heavy navigation conditions as initial disruptive factors

• Mechanical energy
• Electrical/ Magnetic energy
• Chemical energy
• Kinetic (impact) forces
• Thermal energy
• Acoustic energy
Behavioral assumption 1:
Sea voyages are made in a variety of weather conditions.

Behavioral assumption 2:
Weather conditions exert a combination of forces upon the ship and its cargo over a prolonged period.
The second problem:

Unsafe acts
Unsafe Acts

1. Terrorism/ Piracy
2. Commercial crime (fraud, robbing, picking, stealing, contraband)
3. Smuggling & drugs
4. Military operations
5. Passengers’ phobias
6. Revolts
1. Maritime terrorism

- The undertaking activities within the maritime environment, using vessels or fixed platforms at sea against:
  - Passengers or crewmembers,
  - Coastal facilities or settlements, including tourist resorts,
  - Seaport areas and port towns / cities.
Terrorism types:

- Sinking a ship in a port of channel;
- Hijacking a ship;
- Detonating a dirty bomb: A container is used to transport a radiological device into a port or near a city;
- Detonating a conventional bomb;
- Ship attack with Improvised Explosive Device (IED);
- Suicide dive bomber or limpet mine attack;
- Standoff mortar or grenade launcher attack;
- Suicide bombing on ship
Terrorist acts and Consequences

I. Direct consequences

• loss of human life;
• physical destruction of property;
• biological effects;
• response and recovery from the attack.

II. Indirect consequences

• supplier disruptions;
• limit supply of a commodity;
• raise prices.
Fact 1. The number of acts of piracy and armed robbery against ships reported to have occurred in 2010 was 445, against 282 during 2007.

Fact 2. 266 piracy incidents were reported in the first six months of 2011.
Some facts from Regions infected by a piracy

Time of Incident (Local Time)

Service Speed (Knots)

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## Total cost of Maritime piracy, 2010

<table>
<thead>
<tr>
<th>Cost factor</th>
<th>Value /$ billion/</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ransoms: excess cost</td>
<td>0.176</td>
</tr>
<tr>
<td>2. Insurance Premium</td>
<td>0.46 - 3.2</td>
</tr>
<tr>
<td>3. Re-routing Ships</td>
<td>2.4 - 3.0</td>
</tr>
<tr>
<td>4. Security Equipment</td>
<td>0.363 - 2.5</td>
</tr>
<tr>
<td>5. Naval Forces</td>
<td>2.0</td>
</tr>
<tr>
<td>6. Prosecutions</td>
<td>0.31</td>
</tr>
<tr>
<td>7. Piracy Detergent Organization</td>
<td>0.0195</td>
</tr>
<tr>
<td>8. Cost of Regional Economies</td>
<td>1.25</td>
</tr>
</tbody>
</table>

**Total estimated cost**: 7.0 – 12.0

*Source: One Earth Future Foundation, 2011*

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3. Cargo crime

1. An industry estimate states that a loss from cargo, in storage or in transit surpasses $30 - 40 billion per year, globally. (*With indirect costs many times higher.*)

2. The statistics indicate that Cargo Theft costs consumers close to:
   - $15 - 17 Billion per year in the USA
   - €8 - 9 billion per year in Europe.

3. The *favourite locations* for this type of crime are at *ports, loading terminals or during road / rail.*

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Cargo crime – current trends and facts

- 85% of all business security losses are attributed to the loss of product in transit.
- Between 80% and 85% of cargo thefts involve inside information.
- The high profit potential of high-tech cargo thefts is attracting more sophisticated international criminals.
I. **Indirect Financial Impact**

- Interruption to cash flow;
- Loss of sales/ market;
- Loss or Increase of insurance premium;
- Increased administrative costs.

II. **Operational impact**

- Interruption to supply chain;
- Staff frustration and loss of morale;
- Loss of brand image;
- Damage to reputation;
- Tension in relationships with customers and suppliers.
Crime Prevention Code

**Crime Prevention Code**: The set procedures to reduce the likelihood of crime and public fear.

**Two key elements of crime prevention include:**

- **Crime Prevention through Environmental Design – CPTED**
  - *Set of design principles* used by safety lawyers and engineers, to limit the ability to support criminal activity and public alarms.

- **Situational crime prevention - SCP**
  - *A set of management, policy, and legal/prosecution measures* applied to specific categories of criminal incidents.

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The third problem:

Inexperienced and fatigue crew
The fourth problem: Environment pollutions
1. Due to strategic position, the EU Sea Regions are a natural route for oil transport.


3. These activities carry risks for the sea environment.
Conclusion
1. Total consequences of maritime accidents
/5000 years history/

Losses more than:

- 250 thousand ships;
- 5 million persons.
2. Economical consequences of maritime accidents

- **Cargo damage**: over $3,0 bln /year
- **Property damage**: over $2,0 bln /year
- **Injuries (Crewmembers, Passengers)**: approximately $1,8 bln /year
- **Pollutions**: over $1,3 bln /year
- **Collisions**: over $0,5 bln /year
- **Other**: approximately $1,4 bln /year

**Total** – over $10 bln /year
Lecture
The end

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