Mitigating security and safety risk along transport corridors and logistics chain

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Outline

• **Part I**: General concepts with regards the issue
• **Part II**: Groundings for mitigation of security and safety risks along transport corridors and logistics chain from UNESCAP
  – reliability of international railway freight transport operations (UN)
  – prevent and significantly reduce marine pollution of all kinds (UN)
  – reliable and efficient inter-island shipping services (UN)
• **Part III**: Samples to mitigation of security and safety risks along transport corridors and logistics chain
  – multi-layered approach to risk management (EU) (practical perspective),
  – Risk Management Models (doctrinal perspective)
• **Part IV**: Risk mitigation model along transport corridors and logistics chain: combination of practical and doctrinal perspectives
• **Part V**: Turkey example for mitigation of security and safety risks along transport corridors and logistics chain
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Part I

GENERAL CONCEPTS WITH REGARDS THE ISSUE
The Hierarchy:
Supply Chain Management
Logistics
Transport

• **SCM** is the integration of key business processes from end user through original suppliers that provides products, services and information that add value for customers and other stakeholders (Stock and Lambert, 2001).

• **Logistics** aims to “get the right product to the right customer, at the right time, at the right place, in the right condition, in the right quantity, at the right cost” (Russell 2007, p. 59; Plowman 1964).

• **Transport** is the movement of goods, people, services or information from one place to another.
Safe and Secure Transport

• **Freight transport** plays a crucial role for economic activities and is an incremental element of logistics as well as supply chain management.

• Current estimations for Europe are predicting a 50% increase in freight and passenger transport within the next 20 years (Schröder and Prause, 2015).

• Supply chains and logistics systems remain complex, and therefore **vulnerable**.

• In order to enhance the **efficient, speedy and reliable legitimate trade and logistics**, effectiveness of supervising global trade and **safeguarding supply chain safety and security** and other societal challenges related to global trade and logistics shall be enhanced.
Supply Chain Risks

• Damage to property,
• Environmental risks (climate change, political change),
• Business risks,
• Theft (robbery, larceny, hijacking, looting, etc.),
• Organized immigration crime (human trafficking, illegal immigration),
• Piracy,
• IPR (intellectual property right) violations and counterfeiting,
• Planning and control risks (as many of supply chain functions are outsourced uncertainties stem from outsourcing organizations),
• Mitigation and contingency risks (caused by not having alternative solutions),
• Cyber attacks and
• Customs law violations (tax fraud, prohibited goods).
Transport Risks

- Default (loss of the entire cargo),
- Quantitative (partial destruction during transport),
- Quality (damage during transport),
- Cost (increase in transport costs) and
- Time risks (delay/earliness of delivery).
Impacts of the Occurrence of These Risks

- Direct financial impacts such as decrease in shareholder value or decline in stock price,
- Erosion of brand equity,
- Loss of consumer confidence,
- Recalls which create the need for costly reverse supply chain activities,
- Introduction of strict government regulations.
Part II

GROUNDINGS FOR MITIGATION OF SECURITY AND SAFETY RISKS ALONG TRANSPORT CORRIDORS AND LOGISTICS CHAIN
Grounding (1):
Regional Meeting on Harmonization of Rules and Regulations for Facilitation of International Railway Transport
(Astana, 20-21 December 2017)

• ESCAP member countries adopted in 2015 through Resolution 71/7 the Regional Cooperation Framework for Facilitation of International Railway Transport aiming to strengthen international railway transport in Asia and the Pacific,

• Aim to support the operationalization of the Intergovernmental Agreement on the Trans-Asian Railway Network by supplementing the efforts of the railways in the region to enhance the efficiency of the railway border crossing processes and technical and operational compatibility along international railway corridors, to increase reliability of international railway freight transport operations.
Grounding (2): UN ESCAP 2030 Agenda (Asia-Pacific Forum on Sustainable Development 2017)

• Cluster of Goals:
  – 14.1 By 2025, **prevent and significantly reduce marine pollution of all kinds**, in particular from land-based activities, including marine debris and nutrient pollution.
• Transport and the Millennium Development Goals:
  – Actions possible at the regional level include the following: (a) **Studying the effectiveness and economic consequences of various strategies for securing safe, reliable and efficient inter-island shipping services.**
Part III

SAMPLES TO MITIGATION OF SECURITY AND SAFETY RISKS ALONG TRANSPORT CORRIDORS AND LOGISTICS CHAIN
  - PRACTICAL PERSPECTIVE
  - DOCTRINAL PERSPECTIVE
The overall aim of the Strategy is to achieve a high-quality, *multi-layered approach to risk management.*

The Strategy takes account of the variable nature and the broad range of the risks to be addressed.

It recognizes the primary responsibility that customs authorities have for the supervision of EU international trade in goods.
Practical Perspective: EU Strategy and Action Plan for Customs Risk Management (Brussels, 19.7.2016)

• **Objective 1:** Improving data quality and filing arrangements *(setting legal requirements to ensure that high-quality data on supply chain movements)* for effective risk management.
  
  – Provisions within acts have been enacted within EU however,
  
  – **Developing IT access by customs** to the economic operators systems in the area of aviation security has not yet started!
Practical Perspective: EU Strategy and Action Plan for Customs Risk Management (Brussels, 19.7.2016)

• Objective 2: Ensuring availability of supply chain data and sharing of risk-relevant information and control results \(\text{(traceability of goods movements)}\) between customs authorities in order to analyze and mitigate risks and ensure equivalent treatment of economic operators.

  – Ongoing Action: Identify options for traceability of goods movements in the various stages of supply chain movements involving more than one Member State and through data provided by economic operators; and identifying appropriate solutions of customs supervision from their entry into the Union customs territory to their final customs clearance, taking account of ongoing initiatives and/or by adjusting the existing customs transactions systems.
Practical Perspective: EU Strategy and Action Plan for Customs Risk Management (Brussels, 19.7.2016)

• Objective 3: Implementing the concept of ‘assess in advance — control where required’ to respond adequately to risks identified at EU and national level while maximizing efficiency in the use of resources and the fluidity of the supply chain

– Ongoing Action: Taking into account outcomes of recommendations to provide guidance in the preparation or review of legislative acts which foresee customs controls, by describing how customs action can be envisaged in line with the Union customs legislation and international trade practices
Objective 4: Increasing capacity to ensure consistent and effective implementation of the Common Risk Management Framework (CRMF) (through training sessions) and to increase responsiveness to newly identified risks

- Through projects initiated by Member States: ENS (Entry Summary Declaration) pilot (Maritime — initiated by Portugal) and the Common Risk Analysis Initiative of the Land Frontier Contact Group (initiated by Hungary) capacity gaps and variances in the national systems and applications are being identified.
- German customs is continuously analyzing national and EU requirements required for more effective and efficient risk management.
- Malta also ensures a periodical revision of risk profiles for an effective use of the risk analysis system.
Practical Perspective: EU Strategy and Action Plan for Customs Risk Management
(Brussels, 19.7.2016)

• **Objective 5:** Promoting interagency (between customs and other authorities) cooperation and **improving information sharing between customs and other authorities** at Member State and EU level, in order to ensure effective risk management

  – Croatian and Spanish customs authorities have signed **cooperation agreements** for integrated border management with relevant authorities,

  – At EU and national level customs **actively contributes to improving supply chain security and supports risk-based surveillance of goods movements in the maritime domain** in the fight against terrorist and organised crime activities such as the smuggling of goods and the trafficking of arms and narcotics, along with cross-border movements of cash as proceeds of this illegal trade.

  – Non member to EU such as China; a set of recommendations has been endorsed by a mixed group of customs and environmental authorities

    • Since then a second Action Plan has followed, the Action Plan concerning EU-China customs cooperation on IPR 2014-2017, while a third plan for 2018-2020 is prepared and awaiting to be signed.

  – Sharing of risk information between customs and other authorities is done at a daily basis in Austria, the Czech Republic, Denmark, Estonia, Finland, Greece, Germany, Ireland, Italy, Latvia, Luxembourg, Poland and Slovenia.

Regional Conference for Logistics Service Providers
(Busan, Republic of Korea; 21 June 2018)
Objective 6: Developing cooperation with trade to secure and facilitate legitimate trade

- Belgium, Greece, Ireland, Slovenia, Spain, Sweden ensure systematic and continuous analyses of cases recorded by the AEO (Authorized Economic Operator) helpdesk and through the monitoring process of the AEO network.
Objective 7: Tapping the potential offered by international cooperation to improve risk management of the supply chain, for better identification of risks, more effective risk mitigation and cost reduction for operators and authorities.

- The EU has concluded agreements on customs security measures with Norway, Switzerland, Andorra, the United States of America, Japan and China.
- The benefits in each case depend on the provisions defined in the agreement.
- AEO MRA (Mutual Recognition Agreement) negotiations are underway with Canada. An automated data exchange solution has already been deployed for exchange of data between the EU and China, Japan, Switzerland and the USA.
Doctrinal Perspective: Risk Management Plans

• In order to cope with risks and to achieve corporate goals, it is necessary to implement risk management.
• Risks may have an influence on the flows of products, services, finance and information.
• Risks follow from the uncertainty of future events, especially for logistics which is significantly outsourced by various firms.
Doctrinal Perspective
(for all types of business):

PPRR

• In order to handle the risks business continuity management (BCM) focuses the application of risk analysis specifically to those events which are likely to cause significant business disruption.
• Is one of the and most popular BCM plans.
• The prevention, preparedness, response and recovery (PPRR) model is a comprehensive approach to risk management.
• This model has been used by Australian emergency management agencies for decades and aim to save the business time and money when responding to a setback, incident or disaster.
• PPRR Steps:
  – Prevention - take actions to reduce or eliminate the likelihood or effects of an incident.
  – Preparedness - take steps before an incident to ensure effective response and recovery.
  – Response - contain, control or minimize the impacts of an incident.
  – Recovery - take steps to minimize disruption and recovery times.
PPRR MODEL

Business Continuity Planning Process

Prevention
Risk Management Plan

Rehearse, maintain and review

Preparedness
Business Impact Analysis

Response
Incident Response Plan

Recovery
Recovery Plan
Doctrinal Perspective (exclusive to supply chain):
Supply Chain Risk Management

Figure 1: Three research approaches to risk mitigation
Supply Chain
Risk Management

• The first approach in the Figure is completely limited to **operational and tactical measures** that are effective to mitigating individual risks (see Chopra and Sodhi, 2004; Pujawan and Geraldin, 2009).
  – This focuses on identification and measurement of individual risks, thereby generating direct solutions rather than overarching corporate strategies.

• Although the second approach starts from analysis of risks similar to the first approach, **its holistic risk analysis to find out the risk sources, loss types and root causes** may lead the risk mitigation to the **strategic level** (see Ellegaard, 2008) as well as the operational/tactical levels. ➞ Shall be preferred hence it is both operational and strategic.

• Compared to the previous approaches, the third approach focuses solely on the **strategic measures by applying theories and research frameworks** in the SCM or other management disciplines (see Bode et al., 2011; Christopher et al., 2011).
Types of SCRM strategies*:
«Annual Logistics Research Network Conference»
Held 3-5 September 2014 at University of Huddersfield

• **Type 1 - Building a stable logistics network (SL) strategy:** It comprises of time- and resource-consuming practices, but once disciplined and flexible logistics network is built, the needs for information processing can be significantly reduced since the likelihood of risk occurrence is minimized.

  – **Practices:** Hedging, Avoidance, Strict Procedure, Insurance

*Risk Management Strategies for International Logistics: Cconceptualization and Validation (Dong-Wook Kwak, Anthony Beresford, Stephen Pettit, Robert Mason and Hee-Yong Lee)
Types of SCRM strategies:
«Annual Logistics Research Network Conference»
Held 3-5 September 2014 at University of Huddersfield

• **Type 2 - Leveraging logistics information (LI) strategy:** the ability to proactively respond to risk events and redesign the network promptly must be built upon accurate and real-time information available to all staffs.

• **Type 3 - Leveraging outsourcing contracts (OC) strategy:** quality of logistics operations must be ensured first in order to minimize the uncertainties stemming from the external organizations.

  – **Practices:** Monitor & Audit, Certification, Penalty, Multi-Criteria Selection, Risk Transfer
Types of SCRM strategies: «Annual Logistics Research Network Conference»
Held 3-5 September 2014 at University of Huddersfield

• **Type 4 - Developing logistics collaboration (LC) strategy:** specifies collaborative relationships among partners to enhance the information processing capability.
  
  — **Practices:** Partnership, Information Sharing, Communication Channels, Joint Management, Goal Alignment

• firms use a mix of those four strategies to mitigate risks when the large coefficients of inter-correlations between strategies are taken into account
# Types of SCRM strategies:
«Annual Logistics Research Network Conference»
Held 3-5 September 2014 at University of Huddersfield

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Practices</th>
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<tbody>
<tr>
<td><strong>Type 1</strong> Building a stable logistics network</td>
<td>Hedging</td>
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<td></td>
<td>Avoidance</td>
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<td></td>
<td>Strict procedure</td>
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<td>Insurance</td>
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<tr>
<td><strong>Type 2</strong> Leveraging logistics information</td>
<td>Integrated system</td>
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<td>Real-time evaluation</td>
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<td>Decision-making</td>
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<td>Real-time data collection</td>
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<td>Knowledge management</td>
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<tr>
<td><strong>Type 3</strong> Leveraging outsourcing contracts</td>
<td>Monitor &amp; Audit</td>
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<td>Certification</td>
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<td>Penalty</td>
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<td>Multi-criteria selection</td>
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<td>Risk transfer</td>
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<tr>
<td><strong>Type 4</strong> Developing logistics collaboration</td>
<td>Partnership</td>
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<td>Information sharing</td>
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<td>Communication channels</td>
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<td>Joint management</td>
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<td>Goal alignment</td>
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(Busan, Republic of Korea; 21 June 2018)
Part IV

RISK MITIGATION MODEL ALONG TRANSPORT CORRIDORS AND LOGISTICS CHAIN: COMBINATION OF PRACTICAL AND DOCTRINAL PERSPECTIVES
Risk Mitigation Model along Transport Corridors and Logistics Chain: Combination of Practical and Doctrinal Perspectives

(Assoc. Prof. Dr. Nil Kula Degirmenci)

Systemic Risk Analysis
- classification of risks (pg. 6-7)

Prevention

Supply Chain Risks: damage to property, environmental risks, business risks, theft, organized immigration crime, piracy, IPR violations and counterfeiting, planning and control risks, mitigation and contingency risks, cyberattacks and customs law violations.

Transport Risks: loss of, damage to and delay in delivery of the cargo.

shows doctrinal perspective
shows practical perspective
shows interacting stages

Recovery

*Insurance Coverage against Supply Chain and Transport Risks (pg. 27)

Preparedness

Response

- Knowledge Management (Ex. EU Strategy on Risk Management
  - Objective 4: training sessions)
  - Risk Transfer
  - Goal Alignment (pgs. 28-29-30)

*Hedging
*Avoidance
*Strict procedures

Step 1: Build a stable logistics network strategy

- Hedging
- Avoidance
- Strict procedures

Step 2: Leverage logistics information strategy

- Integrated systems
- Real-time evaluation
- Decision making
- Real-time data collection

Step 3: Leverage outsourcing contracts strategy

- Monitor & Auditing
- Certification
- Penalty
- Multi-criteria selection

Step 4: Develop logistics collaboration strategy

- Partnership
- Information sharing
- Communication channels

Ex. EU Strategy on Risk Management
- Objective 1: setting legal requirements
- Objective 2: traceability of goods
- Objective 3: control where required

Ex. EU Strategy on Risk Management
- Objective 5 - 6 - 7: Interagency – trade based and international cooperation
Interacting Stages:  
Legal Requirements vs. Insurance Coverage  

• **Preparedness** stage is focused on setting legal requirements.  
• Setting legal requirements will override uncertainties.  
• The decrease in the number of uncertainties will **lower the insurance premiums** which is focused by the **recovery** stage of the supply chain risk management system.  
  – Hence when the future is uncertain, there remains the possibility of loss both to the insured (to the extent the risk is not insured) and to the insurer.  
• Thus they have a parallel relationship.
(1) Detailed Analysis on Legal Requirements

• Damage to cargo, loss of cargo and delay in delivery are the most frequently faced transport risks and governed under various international conventions and domestic legislations.
(1) Detailed Analysis on Legal Requirements

**INTERNATIONAL MULTIMODAL TRANSPORT RULES**
UNCTAD ICC Rules for MT, FIATA Trading Conditions, UTIKAD Trading Conditions

**INTERNATIONAL UNIMODAL TRANSPORTATION RULES**

- **by Sea**
  - Hague-Hague Visby, Hamburg Rules

- **by Rail**
  - CIM/COTIF Rules

- **by Road**
  - CMR Rules

- **By Air**
  - WARSAW Rules

- **By Inland waterways**
  - BUDAPEST Rules

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Uniformity Through These Legal Requirements?

• Legal uniformity is the regulation of same issues through similar provisions, thus having the reliability to have the similar decision in similar cases under different domestic laws. As a result trust on the legal system and thus sustainability of the transaction will be ensured.
Uniformity Chain

- Determinability
- Reliability
- Continuance
Uniformity Through These Legal Requirements?

• **Maritime transportation;** governed under three conventions?
  – Hague rules (1924)
  – Hague Visby rules (1961)
  – Hamburg rules (1978)

• **Multimodal transportation;**
  – MTC (1980) (not in force)
  – UNCTAD ICC Rules (1992) (advisory characteristics)
(1) Detailed Analysis on Legal Requirements

- In order to govern the whole supply chain risks which are pointed in the above sections of the presentation, there is no broadly accepted and applied list of conventions hence supply chain is heavily outsourced by various actors, stages and states.
(2) Detailed Analysis on Insurance Coverage

- **Insurance;** an arrangement by which a company or the state undertakes to provide a guarantee of compensation for specified loss, damage, illness, or death in return for payment of a specified premium.

- **Cargo insurance;** benefit for the cargo interests.
  - That will cover the damage on, loss of and delay in delivery of the cargo.
  - Subsequently the insurer recourses to the person liable.
  - Mandatory or non-mandatory.
  - Third party benefit or direct benefit.
    - Ex. INCOTERMS CIF and CIP requires the undertaking of buyers risks under an insurance contract signed by seller.

- **Liability insurance;** benefit for the logistics operators.
  - That will cover the liability of the logistics operators which incur against the cargo interests.
Part V

TURKEY EXAMPLE FOR MITIGATION OF SECURITY AND SAFETY RISKS ALONG TRANSPORT CORRIDORS AND LOGISTICS CHAIN
Usage of Transport Modes in Turkey in terms of Passenger and Cargo
Comparison of the Usage of Transport Modes between Turkey and Asia Pacific Countries

• Turkey in 2017
  – Air transport:
    • passengers/km approx. %6.5 of Asia Pacific
    • tons /km approx. %3.6 of Asia Pacific
  – Railway transport:
    • passengers/km approx. %0.1 of Asia Pacific
    • tons /km approx. %0.1 of Asia Pacific
  – Road transport:
    • passengers/km approx. %2.9 of Asia Pacific
    • tons /km approx. %2.3 of Asia Pacific
Mitigation of Security and Safety Risks along Road Transportation in Turkey

• **Certificate of authorization**
  – In accordance with CMR and related domestic regulations, and in order to fill the legal gaps and control the quality of road transportation,
  – by 2017, 504,536 authorization certificates are issued,
  – Through new security system adopted by the Ministry, number of *certificates required will be decreased* from 53 to 13,
  – Unavoidably lost of one of the required certificates will not lead to monetary punishment given by the government (*judicial decision given by Istanbul 16th criminal court of peace in 2013*).

• **Certificate of professional competency**
  – In order to ensure the management of road transportation by competent persons,
  – by 2017, 399 professional competency institutions have been established.
 Mitigation of Security and Safety Risks along Road Transportation in Turkey

- Roadside control stations
  - In order to measure the weight and length of the vehicles, and control the existence of professional competency documents,
  - by 2017, 75 fixed roadside control stations have been established with the support of EU funds.
Mitigation of Security and Safety Risks along Road Transportation in Turkey

• **Vehicle inspection stations**
  – In 2017, 6,484,603 vehicles are controlled; each 4 vehicles in 10 vehicles have been made secured through these controls.

• **Mandatory liability insurance coverage**
  – Only for road passenger transportation.

• **Emergency transport services**
  – In 2014, duty to perform the coordination in emergency situations has been given to the Ministry of Transport to handle the risk management in the occurrence of emergency situations.
Mitigation of Security and Safety Risks along Road Transportation in Turkey

• Recalling of the down-model vehicles from the market
  – In 2017, 118,560 down-model vehicles have been purchased by the Ministry in return of 581,923,418 TL in total.

• Financial aid to the successors of the drivers who has been attacked during transportation

• Intelligent transport systems
  – In order to receive immediate information with regards to the accidents and attacks,
  – By considering the ITS approaches of USA, South Korea, Japan, Germany and England.

• Seismic recruitment studies
Mitigation of Security and Safety Risks along Road Transportation in Turkey

• **Electronic transportation tracking and control system**
  – Cargo and passenger which are carried through roads will be followed,
  – All the information with regards the voyage will be known before the commencement of the voyage,
  – Important as for transportations made to Syria or Iraq.
Mitigation of Security and Safety Risks along Maritime Transportation in Turkey

- **Vessel traffic management and information systems**
  - Especially in the waters that have traffic density.

- **Automatic identification systems**
  - In order to increase the safety and security in coastal areas and territorial waters, and decrease the risks of accident in these areas.

- **ISPS (International Ship and Port Facility Security) Code Compliance Inspection**
  - By 2017, security plans of 533 ships have been approved in accordance with ISPS Code.

- **National marine safety and emergency response center**
  - In 2017, duty to perform the coordination in emergency situations has been given to the Ministry of Transport to handle the risk management in the occurrence of emergency situations, especially in order to protect marine environment.
Mitigation of Security and Safety Risks along Maritime Transportation in Turkey

- **Local traffic control centers**
  - In order to decrease the risks of marine accidents to minimum level especially in Turkish straits.
  - In order to ensure the long-range identification and tracking of ships (LRIT) which has been established by IMO in 2010.
Mitigation of Security and Safety Risks along Maritime Transportation in Turkey

- **Education and certification**
  - In accordance with STCW (Standards of Training, Certification and Watch keeping for seafarers) convention.

- **Mandatory liability insurance coverage**
  - For all types of passenger ships,
  - Cargo ships which are and over 300 grt. shall have a P&I insurance coverage in order to enter into Turkish ports.

- **Port state and flag state control**
  - 2003-2005 Turkish flag was in black list.
  - 2006-2007 Turkish flag was in gray list.
  - Since 2008 Turkish flag is in white list.

- **COSPAS-SARSAT system**
  - Search and rescue system through the assistance of satellite.
Mitigation of Security and Safety Risks along Air Transportation in Turkey

• The European Community Safety Assessment of Foreign Aircraft (SAFA) controls
  – licenses of the pilots; procedures and manuals that should be carried in the cockpit; compliance with these procedures by flight and cabin crew; safety equipment in cockpit and cabin; cargo carried in the aircraft; and the technical condition of the aircraft are assessed.
  – is one of the most important source that serves data for the preparation of EU black list.
  – Turkey is one of the countries that performs SAFA controls at high range.
  – in 2017, SAFA point of Turkey has been decreased from 0.51 to 0.27 and Turkey increased to the fourth degree in terms of security alignment in Europe.

• Safety Assessment of National Aircraft (SANA) controls

• One-stop security
  – Recognition of security measures that have been taken by a foreign state in order to ensure uniformity in mitigating security risks.

• Training center project
Mitigation of Security and Safety Risks along Air Transportation in Turkey

• SAFA, SANA and other controls performed in Turkey:
Mitigation of Security and Safety Risks along Air Transportation in Turkey

• SAFA point of Turkey:
Mitigation of Security and Safety Risks along Rail Transportation in Turkey

• Safety management system
  – Through the commencement of the usage of high speed trains in 2009 this system has been established,
  – Safety policy has been founded,
  – In compliance with 2004/49/EU numbered railway safety directive of EU.

• Projectrail and Secur-ed Project
  – In compliance with 7th framework program of EU.

• Professional competency train machinist
  – In compliance with 2006 dated domestic regulation educations and required certificates are determined.
Mitigation of Security and Safety Risks along Logistics Chain in Turkey

• In order to mitigate the cyber security risks, Internet Change Points which are emphasized within 2016-2019 National Cyber Security Action Plan, are being established.
Part VI

PROPOSED APPROACH
Proposed Approach

• The mitigation of risk along transport corridors and logistics chain depends heavily on the existence of powerful risk management system which is controlled under a uniform law that is familiar to the requirements of practice and covered by insurance.

• Additionally; traceability of goods, interagency, international and trade based cooperation and educational trainings shall take place in this system.
Thank you for listening.