

**DIGITALISATION AND CIRCULAR ECONOMY:  
forestry and forestry based industry implications**

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▀ **Risk assessment of  
timber wood fumigation  
by applying the  
requirements of ISO  
9001:2015**



Antoaneta Stoyanova

Marieta Stefanova

Damyan Kirechev



University of Economics -  
Varna

# The main challenges

- The quality-related topics are highly important when it comes to the customer expectations meeting what the Market has to offer;
- The quality-related topics are strongly dependent on the manufacturers or traders achieving good financial performance;
- Prevention of unfair commercial and consumer practices;
- A huge part of the harvested timber and wood material produced in Bulgaria is subject to the illegal forests felling followed by illegal export;
- The objective need for sustainable consumption and production of forestry;
- The international timber trade is a regulated process that is greatly dependent on the application of phytosanitary measures upon both the timber import and export.

# Research goal and method

- The purpose of study is by applying a risk-based thinking approach to the standard ISO 9001: 2015 in order to assess the risk taken in the fumigation process of otherwise unprocessed raw wood material intended for export.
- The accomplished by identifying and analyzing the types of risks arising from the process performance determined by the impact of reported external and internal circumstances.
- The validated and standardized method FMEA (Failure Modes and Effects Analysis) has been used to assess the risk carried by the fumigation process of unprocessed raw wood material.


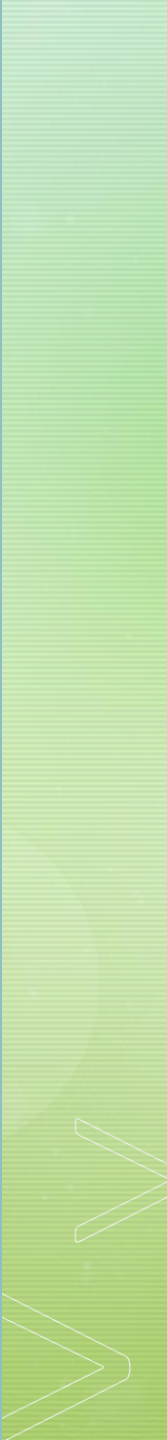
# The European legislation

- COUNCIL REGULATION (EC) No 2173/2005 of 20 December 2005 on the establishment of a FLEGT licensing scheme for imports of timber into the European Community ("FLEGT Regulation") as a part of the legislation implementation strategy of EU from 2003 to the forestry management and trade;
- COMMISSION REGULATION (EC) No 1024/2008 of 17 October 2008 laying down detailed measures for the implementation of Council Regulation (EC) No 2173/2005;
- The FLEGT Regulation defines specific rules for the FLEGT licensing scheme implementation through the conclusion of voluntary partnership agreements with timber producing countries that include as a requirement for all wood imports into the EU originating from their FLEGT partner countries to be covered by a so called FLEGT (COM (2018), 448 final, 2018)

# The national legalization

- **Plant Protection Act** - The law governs public relations related to the implementation of the internationally established phytosanitary measures for plant protection from the International Plant Protection Convention (IPPC), the plants and plant products protection against economically important pests and their cross-border spread, and protection of integrated plant production.



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- The Bulgarian timber exporters it is indispensable to manage their procedures by implementing mechanisms that would ensure compliance with all regulations.
  - It is necessary for them to ensure suitable conditions, to implement mechanisms and to provide objective evidence proving that the quarantine pests in the timber (if any) have been eliminated and the export requirements from Bulgaria have therefore been fulfilled.
  - The international standard - BDS EN ISO 9001: 2015 sets requirements for the establishment and the implementation of a Quality Management System able to manage different interrelated processes determining the activities of logging and timber trading companies.
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# The necessary of the integrated pest management

- The method include science-based warning, forecasting and early diagnosis systems, as well as decision making on the type and frequency of the applied precautions for plant protection according to the established thresholds of economic harm.
- Upon deciding on the type of plant protection methods to be applied, the most important factors are the quarantine pest species typical for the product that is subject of economical harm, so are the specific areas of harvesting and the climatic conditions according to the given period.
- Depending on the type of goods exported, there are chemical, biological and physical methods of pest control which may be applied.



- This may include the use of several plant protection products with different action mechanisms;
- The applied plant protection products need to be selective in terms of purpose and to have minimal side effects on the human health, on the beneficial organisms and on the environment;
- As a natural material the wood chippings, especially when untreated and in an appropriate environment for development of various biological hazards (microorganisms and insects);
- The effects of such biological hazards are directed towards phytopathogenic diseases that lead to destruction of the wood structure and wood structure and composition deficiencies .
- The damage caused from the appearance of these hazards is being measured by the realization of high costs.



# Pest of timber wood



Wood borer



Wharf borer



Flying insects



Termites



Ants



Spiders

# Fumigation process in Bulgaria

- The main method of fighting pests is the chemical;
- The process of timber fumigation for export from Bulgaria is most often carried out by an external contractor;
- Whether the process is proprietary to the organization or outsourced, a risk assessment of these processes is required in order for the requirements to be met and a compliance to be ensured.

# Need for risk management

Eliminating all risks associated with fumigation performance as well as achieving an absolute safety is practically impossible.

The solution to this problem and to others is specifically related to the risk management of processes which have already been identified and controlled.

The highlight is on managing the activities and processes that can be considered as risky or uncertain, and furthermore it is necessary to focus on implementing precautions related to:

- Usage of risk assessment and risk management to identify and implement adequate risk management precautions to minimize the risk;
- Accumulating risk data and knowledge and applying models for understanding, assessing, characterizing, communicating and managing the risk.

# ■ The methodology of the International Standard BDS EN ISO 31000: 2018



*Risk Management Process*



## FMEA (Failure Modes and Effects Analysis) method for assessment of the identified risk

- Through the FMEA, it is possible to analyze the efficiency of the measures implemented in the process of fumigation and the measure planning in the process management when there are many deviations.
- Upon the implementation of the FMEA method, **priority risk numbers (RPNs)** for each of the studied factors have been determined by the following formula:

$$RPN=S \times O \times D$$

**S (severity)** - the importance of the consequences from a potential failure;

**O (occurrence)** - the likelihood of the potential failure to occur as a result from its importance;

**D (discovery)** - the possibility of establishing an efficient control in order for the negative impact of the factor to be prevented or found before it has affected the processes in the management system.

# Determination of risk class

Risk class, RPN value	(S) Severity	(O) Occurrence	(D) Discovery
RPN up to 1000 and above?	<b>8 - 10 = High significance.</b> Minor factor changes make significant changes in the shipping and delivery related processes.	<b>8 - 10 = Very high</b> probability of occurrence	<b>7-10 = The possibility for establishment is less than 10%</b>
RPN above 800 Very high risk score	<b>5 - 7 = Average significance.</b> Only a significant factor change exerts influence on the shipping and delivery related processes.	<b>5 - 7 = Moderate probability of</b> occurrence	<b>4-6 = Low possibility for establishment up to 35%</b>
RPN above 340 High risk score	<b>2-4 = Little significance.</b> The factor changes exert little influence on the shipping and delivery related processes.	<b>2-4 = Unlikely to</b> occur.	<b>2-3 = Average possibility for establishment up to 80%</b>
RPN up to 340 Moderate risk score	<b>1 = Minor significance.</b> The factor changes could only cause minor changes in the shipping and delivery related processes.	<b>1 = Minor probability of occurrence.</b> (Impossible)	<b>1 = High possibility for establishment up to 100%</b>

# Register of risks associated with fumigation of raw timber

Risk	O	S	D	RPN
Insufficient qualification and education of the staff performing the fumigation.	6	6	6	216
Lack of license by authorized state authorities for legally performing fumigation services.	8	8	8	512
Unclear rating criteria for contractors performing fumigation services.	6	4	10	240
Unsuccessful fumigation due to unfavourable environmental circumstances (negative temperatures during the loading for export)	4	4	2	32
Lack of PEST Products availability of importers and traders to allow the fumigation process to be performed.	6	4	4	96
Increase of all activity expenses related to changes in the price parameters for plant protection products against pests	8	6	2	96
Insufficient active substance concentration according to the degree the untreated wood material is contaminated	4	6	2	48
Unfulfilled export and fumigation schedules in accordance with the territory exit regulations	6	4	2	48
Lack of ensured airtightness upon fumigation conduction at the object of treatment	8	6	2	96
Overdue terms of exposure	6	6	6	216

Risk	O	S	D	RPN
Short international transit destinations and inadequate exposure times	8	4	4	128
Not authenticating fumigation by control authorities	4	6	4	96
Lack of substitute preparations for specific processing methods or inappropriate weather conditions (environmental temperatures affect the pests viability)	6	8	8	384
Use of unauthorized and unapproved plant protection products that are not registered on the territory of the country	4	6	2	48
Lack of identification of the observation and measurement resources	6	6	2	72
Non-compliance with statutory requirements	6	4	4	96
Customer's claim on wood upon delivery	8	4	2	64
Increase of materials and fumigation costs	8	6	4	192
Lack of financial and material resources for new equipment	4	8	4	128
Acceptance of customer orders that can not be fulfilled	2	4	2	16
Incorrect performance of the accuracy of attached supporting documents	8	4	4	128
Lack of adequate communication rules between control authorities and contractors for fumigation services	6	4	6	144
Unfulfillment of the expedition and delivery due dates	6	4	4	96
Unfulfillment of the transportation conditions	4	6	4	96



Risk	O	S	D	RPN
Infringement of traffic regulations by drivers of vehicles on the road	8	6	8	384
Incorrectly announced subsequent requirements changes	8	6	2	96
Sanctions and penalties imposed by the customer for non-compliance	8	6	2	96
Incomplete and inaccurate expression of the customer requirements	6	6	6	216
Vehicle related orce majeure circumstances	2	4	2	16
Changes in the regulation requirements	8	6	2	96
Early contract termination due to impossibility of execution	4	4	6	96
Unclearly defined and non-delegated responsibilities and rights	4	4	4	64
Likelihood of military action development in the customer's country	4	6	4	96
Lack of information regarding weather changes	6	4	4	96
Profit reduction (loss) due to unfulfilled oreds for wood material	8	4	4	128
Targeting markets with restrictive requirements	6	4	4	96
Loss of loyal customers related to delivery due dates	4	4	2	32

# Conclusion

- Through the performed risk assessment and identification of measures to control the fumigation process risks, the basis for achieving better results and preventing negative consequences for the timber exporting company development has been created.
- By implementing risk-mitigation measures, the basis for enhancing the QMS efficiency, achieving better results and preventing negative consequences, and also the basis for prioritizing through the company's development, has been created.
- The obtained results from the risk assessment can serve as a basis for making adequate management decisions related to goals achievement, ensuring the fulfillment of a consistent quality, preserving the consumer's trust and implementing measures for continuous improvement.

Thank you for attention!

Stoyanova, A.<sup>1</sup>; Stefanova, M.<sup>1</sup>; Kirechev, D.<sup>2</sup>

<sup>1</sup> Department of Commodity science

<sup>2</sup> Department of Agricultural economics

University of economics-Varna, Varna, Bulgaria

