



# Risk-based Inspections

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# Learning Objectives

- At the end of this session, and using your notes, you should be able to:
  - Identify your comfort level and attitudes about risk;
  - Describe the process used in risk assessment;
  - Apply the process to at least one element of a weights and measures program.



**RISK?**



What is your definition of risk?

What are 2 or 3 examples in your  
life?

*noun*

a situation involving exposure to danger.

"flouting the law was too much of a **risk**"


*verb*

expose (someone or something valued) to danger, harm, or loss.

"he **risked** his life to save his dog"

# Risk can be based on:

- Safety/Health
- Economics
- Ethics
- Operations
- Environment
- Society
  
- Combinations of these



ISO 31000:2009, Risk Management –  
Principles and Guidelines;

IEC/ISO 31010:2009 , Risk Management – Risk  
Assessment Techniques

ISO/IEC Guide 73, *Risk management – Vocabulary –  
Guidelines for use in standards*

# Purpose of a Risk Assessment

- To Use:
  - Information or Data
  - Analysis
- To make informed decisions
  - Select between options
  - Minimize risk



# Some Risk Assessment Techniques

- Brainstorming
- Structured Interviews
- Delphi Technique
- Checklists
- SWIFT (What if?)
- Decision Tree Analysis
- Risk Indices
- Consequence/Probability Matrix
- Cost/Benefit Analysis

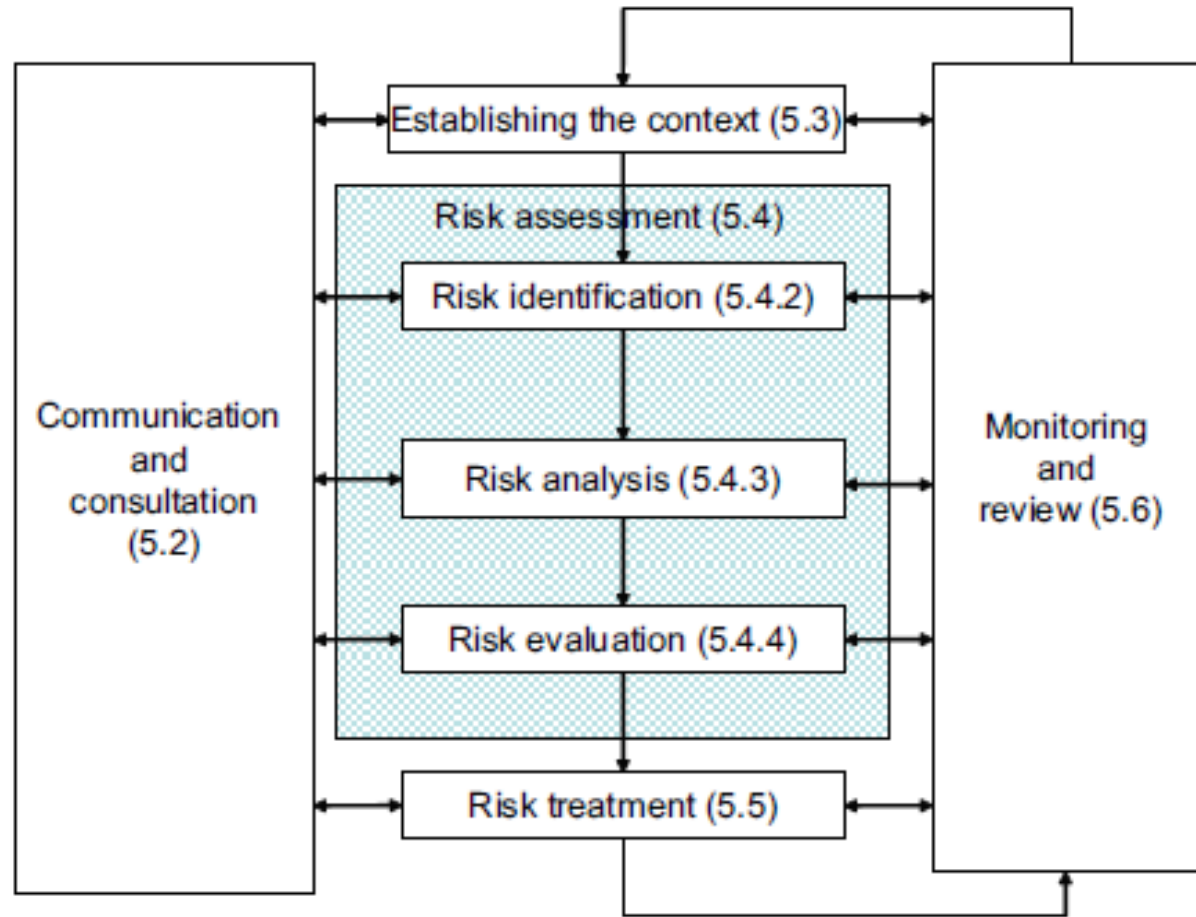


Figure 3 — Risk management process



# Establishing Context or Scope

- Focus on weights and measures inspection programs
  - This could be narrowed further:
    - Price verification
    - Retail Motor Fuel Dispensers
  - Other limitations or exceptions
    - Complaints override
    - Doesn't apply to new installations

# Identify Risks

- What risks are we considering?
  - Safety
  - Fraud
  - Device failure
  - Location/Cost of inspection
  - Economics
  - Others?

## Consequence/Probability Matrix

- Impact/Consequence
- Likelihood/Probability
- Uncertainties
- Sensitivities

Probability

Medium	Critical	Critical
Low	Medium	Critical
Low	Low	Medium

Impact

# Risk Evaluation & Treatment

- Significance of risk
- Prioritization
- Decisions
  - What actions
  - How frequently
  - Sub-actions; if/then scenarios

# Documentation

- Scope and objectives
- Context
- Risk criteria
- Limitations and assumptions
- Analysis and Decision justification
- Conclusions and recommendations





# Monitoring and Reviewing

- Data collection and review
- Analysis
- Modifications based on review

# Recap of the Process

- (Establish the Context)
- Identify Risks
- Analyze
- Risk Evaluation (Prioritize)
- Risk Treatment (Implement)
- (Documentation)
- Monitor and Review

# Example – Tennessee: Device Specific

- Context – Weights and Measures Inspection Program
  - Risks – device error/inspection failure/lack of presence in the market
  - Analysis: Gas pumps have a low failure rate compared to other devices
  - Evaluate: Use random sampling to find errors
  - Treatment:
    - Random selection of hoses/blends by pump number
    - If one or more fail inspection, additional pumps tested
    - If any additional failure, entire station is tested
  - Monitor/Review: Confirm that time savings allows for inspections of high risk devices

# Example – Michigan: Risk # by Device Type

- Risk Categories
  - Likelihood/Probability of Device Failure
  - Severity/Impact due to Failure
  - Compliance Rate
  - Trending Compliance
  - # of Complaints
  - Legislative interest
  - Public Awareness
  - Industry/Stakeholder Interest

Item Vehicle Scale - 2 Section

W&M can use their discretion when assigning category weights for each factor. The values do not have to be concurrent of one another.

Factor No.	Category / Definitions of Risk Values	Category Weight	Low	Moderate	High	Score	Comments
1	<b>Likelihood of Error within 3 Years</b> <b>Low</b> Judgmentally determine the possibility that a given event will occur within a specified timeframe based on industry knowledge, past experience, current industry practices, etc. <b>Moderate</b> <b>High</b>	8	1	2	3	24	
2	<b>Severity of Error (economic, safety, health, etc.)</b> <b>Low</b> Judgmentally determine the degree of negative impact to one or more of the following: Financial, reputational, regulatory, health, safety, security, environmental, employee, customer, and operational impact. <b>Moderate</b> <b>High</b>	8	1	2	3	24	
3	<b>Compliance Rate</b> <b>Low</b> >95% <b>Moderate</b> 85% - 95% <b>High</b> <85%	7	1	2	3	21	Limited data available
4	<b>Trending Compliance Rate (last 3 years)</b> <b>Low</b> Increasing <b>Moderate</b> Constant <b>High</b> Decreasing	4	1	2	3	4	
5	<b># of Complaints</b> <b>Low</b> Less than 12 <b>Moderate</b> > 12 < 100 <b>High</b> > 100	5	1	2	3	5	
6	<b>Legislative Interest</b> <b>Low</b> Consider known or anticipated legislative interest. <b>Moderate</b> <b>High</b>	7	1	2	3	7	
7	<b>Public</b> <b>Low</b> Judgmentally determine the interest to the public. Consider recent media sources. <b>Moderate</b> <b>High</b>	5	1	2	3	5	
8	<b>Industry Stakeholder Interest</b> <b>Low</b> Judgmentally determine the interest to the industry stakeholders. <b>Moderate</b> <b>High</b>	4	1	2	3	8	

Total Score 98

	Likelihood of Error within 3 Years	Severity of Error (economic, safety, health, etc.)	Outside Funding	Compliance Rate	Trending Compliance Rate (last 3 years)	# of Complaints	Legislative Interest	Public Interest	Industry Stakeholder Interest	Total	Priority
Packages	8	7	6	10	12	3	2	4	1	53	
Vehicle Scale - 3+ Section	24	14	6	15	12	3	2	2	2	80	
Single Product Retail Meter	8	14	18	5	4	9	6	6	2	72	
Blended Product Retail Meter	8	14	18	5	4	9	4	4	2	68	
Platform Scale - 1500lbs+	8	14	6	10	8	3	2	2	2	55	
Vehicle Scale - 2 Section	24	24	8	21	4	5	7	5	8	106	
Single Product Meter - Over 25 GPM	16	21	18	5	8	6	4	4	2	84	
LPG Meter - Over 25 GPM	0	0	0	0	0	0	0	0	0	0	
Platform Scale - <1500lbs	8	14	6	5	8	3	2	2	1	49	
LPG Meter - 25 GPM or less	24	14	6	15	12	3	2	4	2	82	
Livestock Scale	14	12	1	16	6	6	4	5	6	70	
Vehicle Tank Meter	0	0	0	0	0	0	0	0	0	0	
Loading Rack Meter	0	0	0	0	0	0	0	0	0	0	
Counter Scale***	2	3	1	7	6	5	3	14	6	47	
Hopper Scale	0	0	0	0	0	0	0	0	0	0	
Monorail Scale	0	0	0	0	0	0	0	0	0	0	
CNG Meter	0	0	0	0	0	0	0	0	0	0	
Person Weighing Scale	0	0	0	0	0	0	0	0	0	0	
Crane Scale	0	0	0	0	0	0	0	0	0	0	
Agri Chemical Meter	0	0	0	0	0	0	0	0	0	0	
Counter / Field Weights	0	0	0	0	0	0	0	0	0	0	
Railroad Scale	0	0	0	0	0	0	0	0	0	0	
Belt Conveyor Scale	0	0	0	0	0	0	0	0	0	0	
Mass Flow Meter	0	0	0	0	0	0	0	0	0	0	

\*\*\* = Not tracked within WinWam

# Example – Florida: Risk # by location & device type

## Price Verification

$$\text{Risk \#} = \text{DSL I} + (20 \times \# \text{ violations}^*) + (20 \times \# \text{ CC})$$

DSL I = Days Since Last Scheduled Inspection

CC = Consumer Complaints received since last scheduled inspection

\*Multiple violations found or corrections issued for a single device should all be included in this number.

## Example - Florida (cont.)

### Package Inspection

$$\text{Risk \#} = \text{DSL I} + (20 \times \# \text{ violations}^*) + (20 \times \# \text{ complaints})$$

DSL I = Days Since Last Scheduled Inspection

CC = Consumer Complaints received since last scheduled inspection

\*Multiple violations found or corrections issued for a single device should all be included in this number.



# Example - Florida (cont.)

## Small Scales

Risk # = DSLI + (20 x # DOOT) + (500 x # DNI) + 200<sup>1</sup> + # CI\* +(20 x # of CC) + # days since permit expired

DSLI = Days Since Last Scheduled Inspection

DOOT = Devices Out Of Tolerance during last scheduled inspection

DNI = Devices Not Inspected during last scheduled inspection

CI = Corrections Issued during last scheduled inspection

CC = Consumer Complaints received since last scheduled inspection

\*Multiple violations found or corrections issued for a single device should all be included in this number.

<sup>1</sup> Score 200 only if business location was cited for majority of devices in favor of vendor.

# Example - Florida (cont.)

## Retail Petroleum

$$\text{Risk \#} = \text{DSL I} + (20 \times (\# \text{ DOOT low} + \# \text{ DOOT})) + (500 \times \# \text{ DNI}) + (200 \times (\# \text{ CIEW} + \# \text{ CIEWS})) + (300 \times \# \text{ FQV}) + 200^1 + (\# \text{ CI}^* + \# \text{ CIS}^*) + (20 \times \# \text{ CC})$$

DSL I = Days Since Last Scheduled Inspection

DOOT = Devices Out Of Tolerance during last scheduled inspection

DNI = Devices Not Inspected during last scheduled inspection

CIEW = Corrections Issued for excess water in storage tank during last scheduled inspection

CIEWS = Corrections Issued for excess water in storage tank since last scheduled inspection

FQV = Fuel Quality Violations in last three years

CI = Corrections Issued during last scheduled inspection

CIS = Corrections Issued since last scheduled inspection

CC = Consumer Complaints received since last scheduled inspection

\*Multiple violations found or corrections issued for a single device should all be included in this number.

<sup>1</sup> Score 200 only if business location was cited for majority of devices in favor of vendor.

# Sharing/Discussion/Questions

## **Resources:**

Department of Commerce Enterprise Risk Management:

<https://connection.commerce.gov/reference-and-other-resources/erm-tools-and-resources>

The Risk Management Institute:

<https://www.theirm.org/the-risk-profession/risk-management/>

Risk Analysis Tutorial at:

[http://www.solver.com/risk-analysis?gclid=CIWC1bKvtMwCFYdehgodP48O\\_Q](http://www.solver.com/risk-analysis?gclid=CIWC1bKvtMwCFYdehgodP48O_Q)

# Conclusion/Summary

- Identify your comfort level and attitudes about risk;
- Describe the process used in risk assessment;
- Apply the process to at least one element of a weights and measures program.



# Thank you!

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