



Risk assessment methods used in Europe

Ankara, Turkey, 15-16 October,
2014

Objectives of easyTools Project

- ◆ Evaluation of existing inspection tools and risk criteria
- ◆ Development of a risk assessment tool for environmental inspections that could easily be used by every IMPEL member
- ◆ Integration into inspection cycle from Step by step guidance book (DTRT)
- ◆ Availability from the IMPEL website as an advanced IT tool
- ◆ Linking to the requirements of the EU environmental law and RMCEI

The questionnaire

- ◆ Definitions used:
 - **Risk** is defined in a broad way. It includes any factor an authority wants to take into account when assessing priorities
 - **Risk Assessment**: process of quantifying the risk by measuring the (potential) effect and the probability of the occurrence
- ◆ The aim of the questionnaire was to get an evaluation of risk assessment tools and risk criteria currently used in IMPEL member countries

The questionnaire

- ◆ The questionnaire consists in several questions regarding:
 - using of risk assessment (RA) in inspections planning
 - for which inspection tasks the RA is used
 - risk criteria (RC), scoring system, weighting factors, mathematical algorithm
 - software tool used for performing the RA
 - evaluation of RA methodology
 - ways for updating the RA
 - what kind of software should be used by the project
- ◆ The questionnaire has been sent out to the National Coordinators of IMPEL

The results of questionnaire

- ◆ There were received 25 answers from: Italy (Lombardi), Ireland, Germany (Munster, Hessen, Hamburg, Detmold, Schleswig-Holstein, Cologne, Bremen, Rheinland-Pfalz), Spain (Extremadura, Basque Country, Madrid), Poland, Portugal, Macedonia, Romania, Latvia, Turkey, France, Slovakia, Denmark, Slovenia, Finland and Greece
- ◆ Since DTRT the number of environmental authorities that use a risk base approach for environmental inspections planning has increased
- ◆ A risk based approach is used for a variety of tasks, most common are IPPC (IED) and Seveso inspections
- ◆ Risk assessment tools, risk criteria and scoring systems vary from country to country
- ◆ Mathematical algorithms are different
- ◆ IMPEL member countries use in the most cases MS-Excel sheets or databases as IT tools for RA

RA tools identified

- ◆ Three general types of methods for RA were identified:
 - **Linear Mean Value:** mean values or sums of all (weighted) criteria scores are assigned to risk categories and inspection frequencies (Spain, Cologne-DE)
 - **Mean Value of Risk:** mean values of impact criteria multiplied by probability criteria are assigned to risk categories (OPRA – EN, NL, PO, PT)
 - **Maximum Value:** inspection task with highest frequency determine inspection frequency (France)

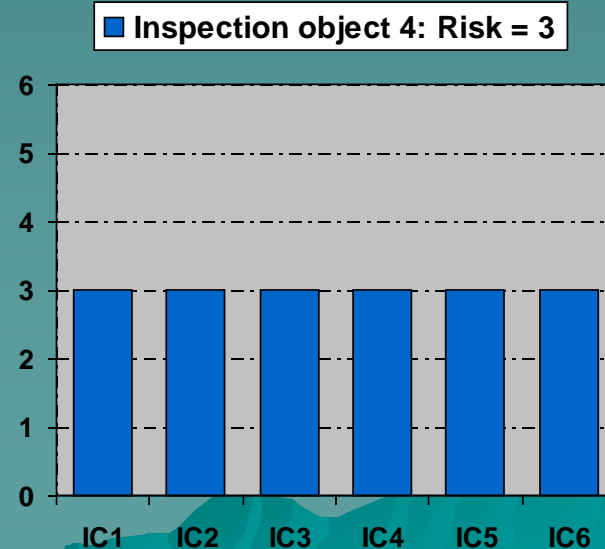
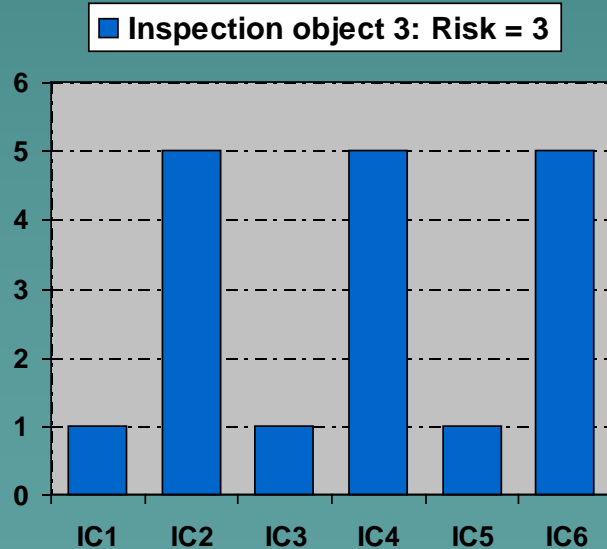
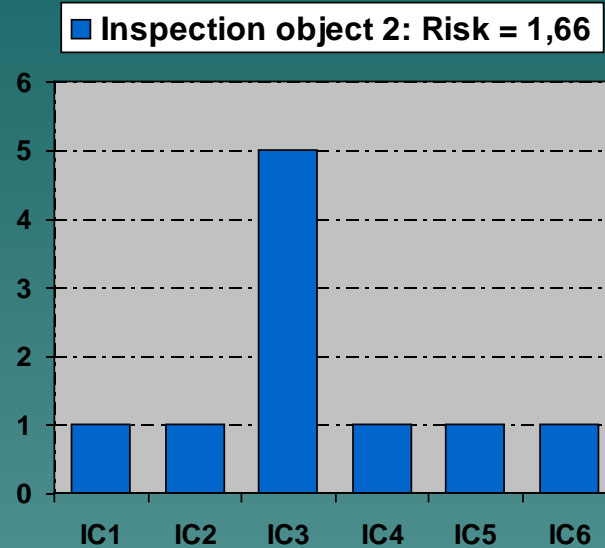
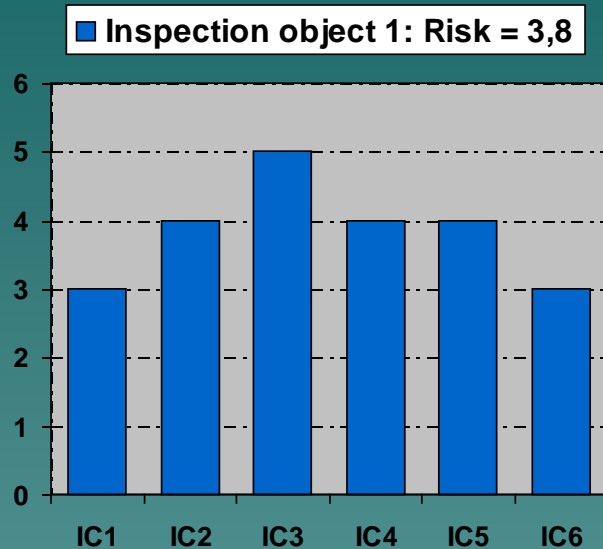
Linear Mean Value

- ◆ Definition of risk is:

$$\text{Risk} = (\text{IC1} + \text{IC2} + \dots + \text{ICn}) / n$$

- ◆ All impact criteria (IC) scores are added and the mean (or average) score is determined
- ◆ Advantages:
 - simple to use
- ◆ Disadvantages:
 - high risks are levelled out by low risks
 - the more criteria, the smaller the spread ("range")
 - the limits of risk categories are not transparent
 - not a real risk assessment because no probability factor is taken in the calculation

Linear Mean Values - examples



Mean Value of Risk

- ◆ Definition of risk is:

$$\text{Risk} = (\text{IC1} + \text{IC2} + \dots + \text{ICn})/n * \text{Probability}$$

- ◆ Basically the same, but Probability is taken in account
- ◆ Advantages:
 - good cumulative effects
 - clear use of weighting factors
- ◆ The same disadvantages except 'Probability'
- ◆ One other disadvantage: the result depends to a great extent on the probability factor

Maximum value

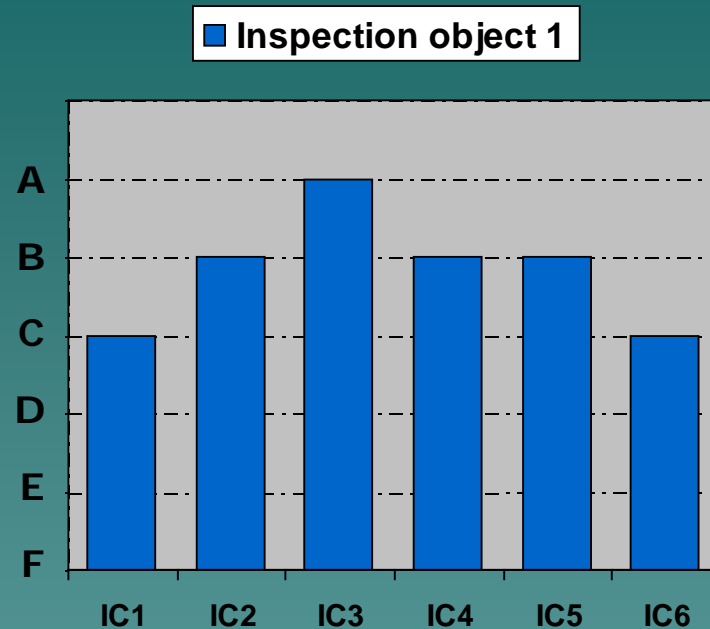
- ◆ Every inspection task has a fixed frequency:
 - Seveso establishment: once a year
 - IPPC installation: every three years
 - Facility under COV Directive: every seven years
 - and so on

Inspection frequency =

Max(inspection task1,
inspection task 2, ...,
inspection task n)

- ◆ The highest frequency counts

Maximum Value - examples



- ◆ A = inspection once a year
- ◆ B = inspection once every 2 years
- ◆ C = inspection once every 3 years
- ◆ D = inspection once every 4 years
- ◆ E = inspection once every 5 years
- ◆ F = no inspections

Maximum Value – advantages & disadvantages

◆ Advantages:

- it is quite simple
- most important effects don't get levelled out in the calculation

◆ Disadvantages:

- No risk assessment within the inspection task
- Not a real risk assessment because no probability factor is taken in the calculation
- The outcome shows a relative higher number of high risk facilities than other methods
- No steering mechanism
- The inspection frequencies of less important inspection tasks do not influence the result. This information about inspection object is not used

Result of the questionnaire

- ◆ Based on the results presented above within easyTools project was developed "Integrated Risk Assessment Method" = IRAM, by
 - combining the advantages of the three methods, while
 - limiting the disadvantages



Thank you four your attention

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