



# ***RISK ANALYSIS SYSTEM BY IRAM TOOL***

## ***(SEVESO - GLOBAL - IED -WWTP - TFS)***

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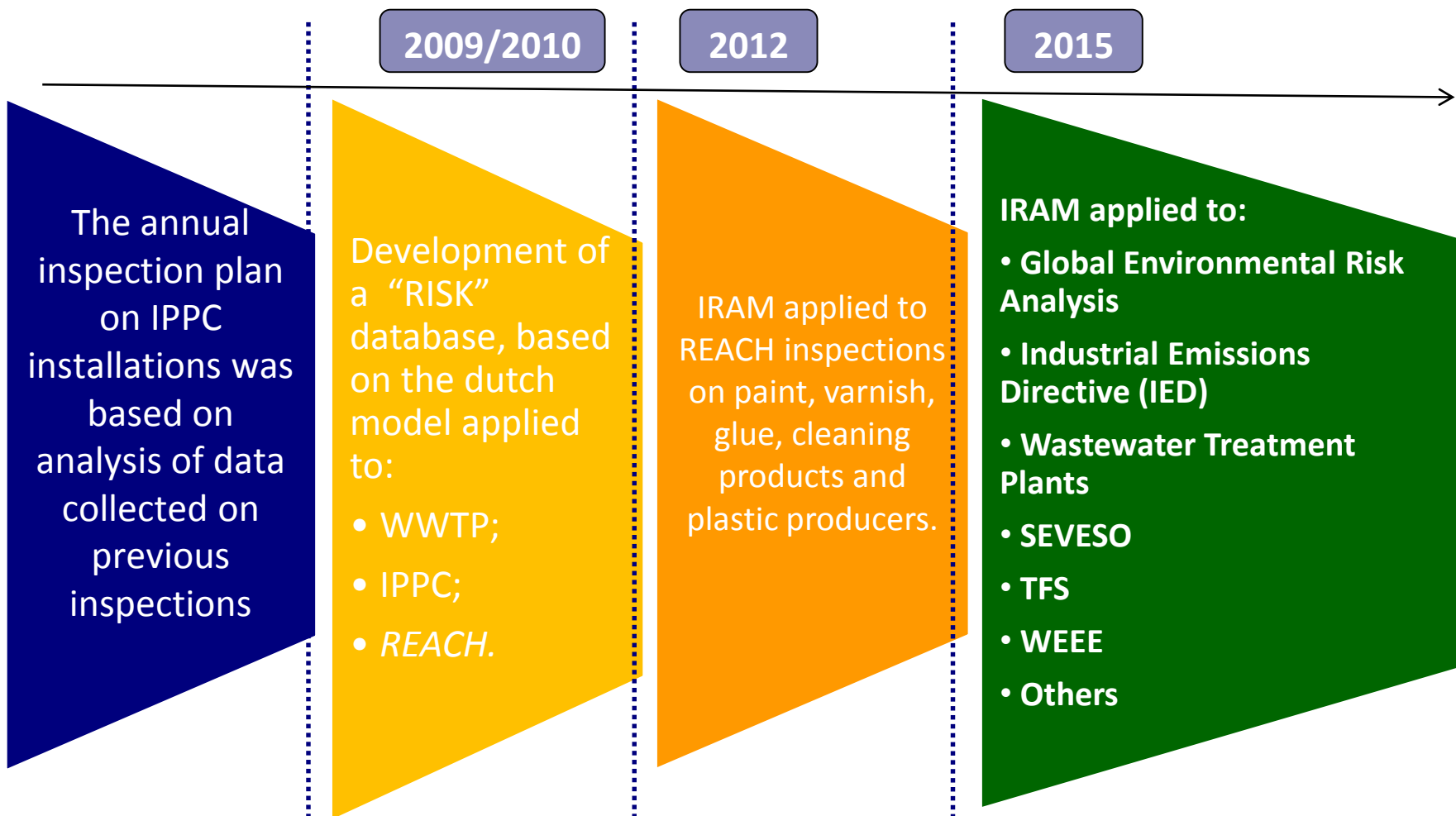
- ☐ Main concepts
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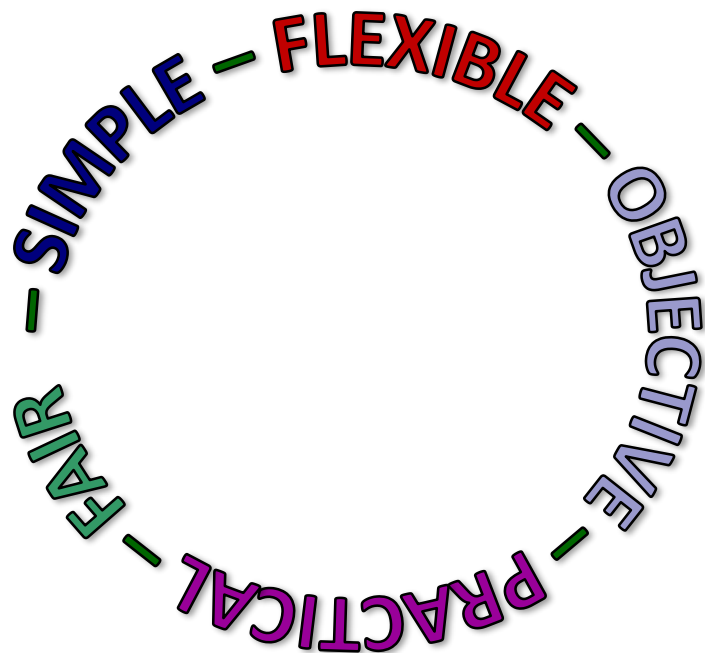
# INTRODUCTION

## STARTING POINT TILL NOW



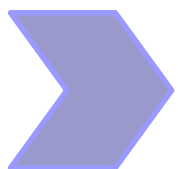
# INTRODUCTION

## WHAT WE LOOK FOR IN PLANNING



# IRAM

## PERFORMANCE



IMPEL PROJECT “EASYTOOLS” (2010/2011) – IRAM (INTEGRATED RISK ASSESSMENT METHOD)



THIS RISK ANALYSIS TOOL IS SIMPLE AND FLEXIBLE ENOUGH AND CAN BE USED BY ANY INSPECTION AUTHORITY TO CARRY OUT THE PLANNING OF INSPECTIONS



THROUGH THIS TOOL WE CAN GET THE RISK VALUE OF EACH INSTALLATION AND THE INSPECTION FREQUENCY

# IRAM

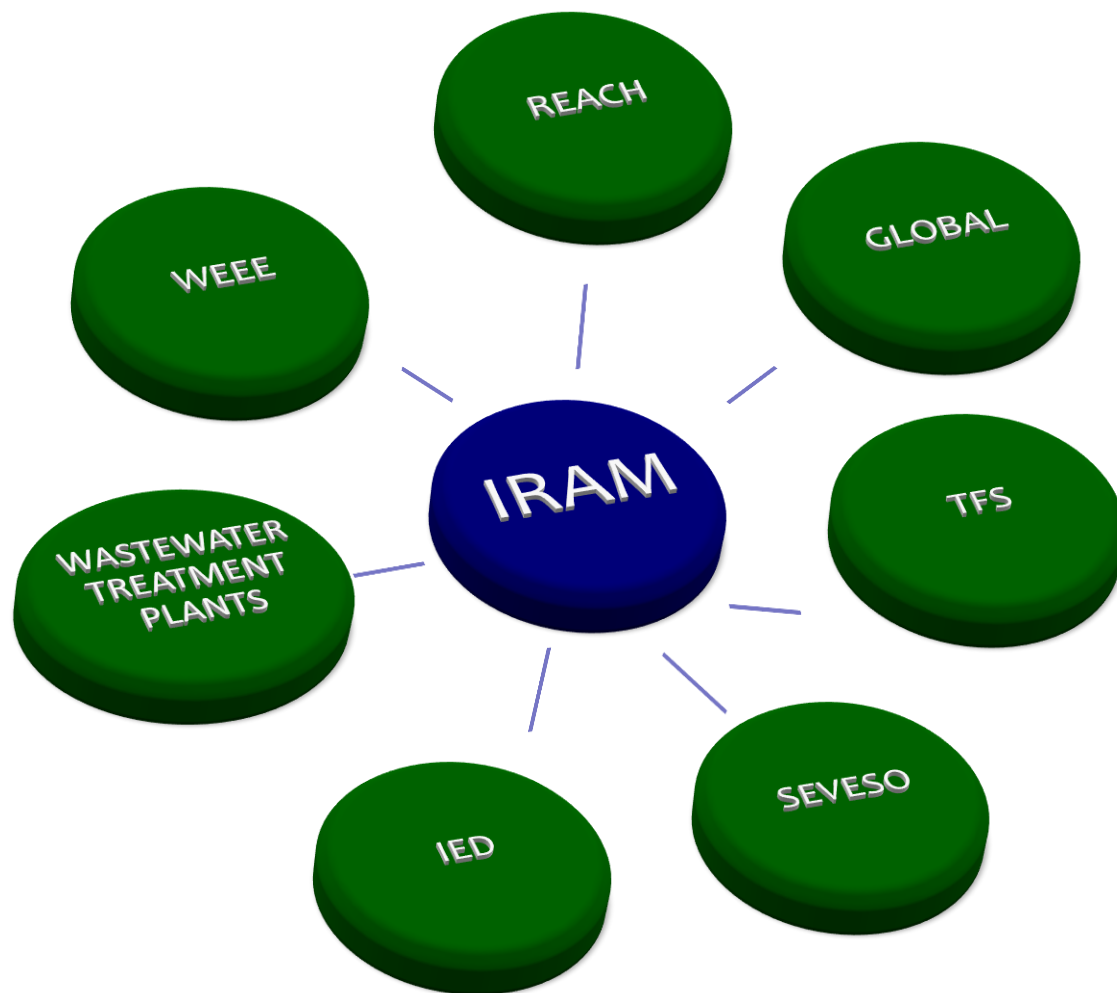
## DEVELOPMENT OF RISK ANALYSIS SYSTEMS

In addition to the development of an IRAM based risk analysis system for REACH inspections, IGAMAOT needed to draw up a risk analysis system for other environmental activities.

For the definition of risk assessment criteria of this system we have carried out some research and consultations within this tool with the similar authorities belonging to the IMPEL network and who had already developed the IRAM tool

# IRAM

## RISK ANALYSIS SYSTEM BY IRAM TOOL - IGAMAOT



# IRAM

## DEVELOPMENT OF RISK ANALYSIS SYSTEMS



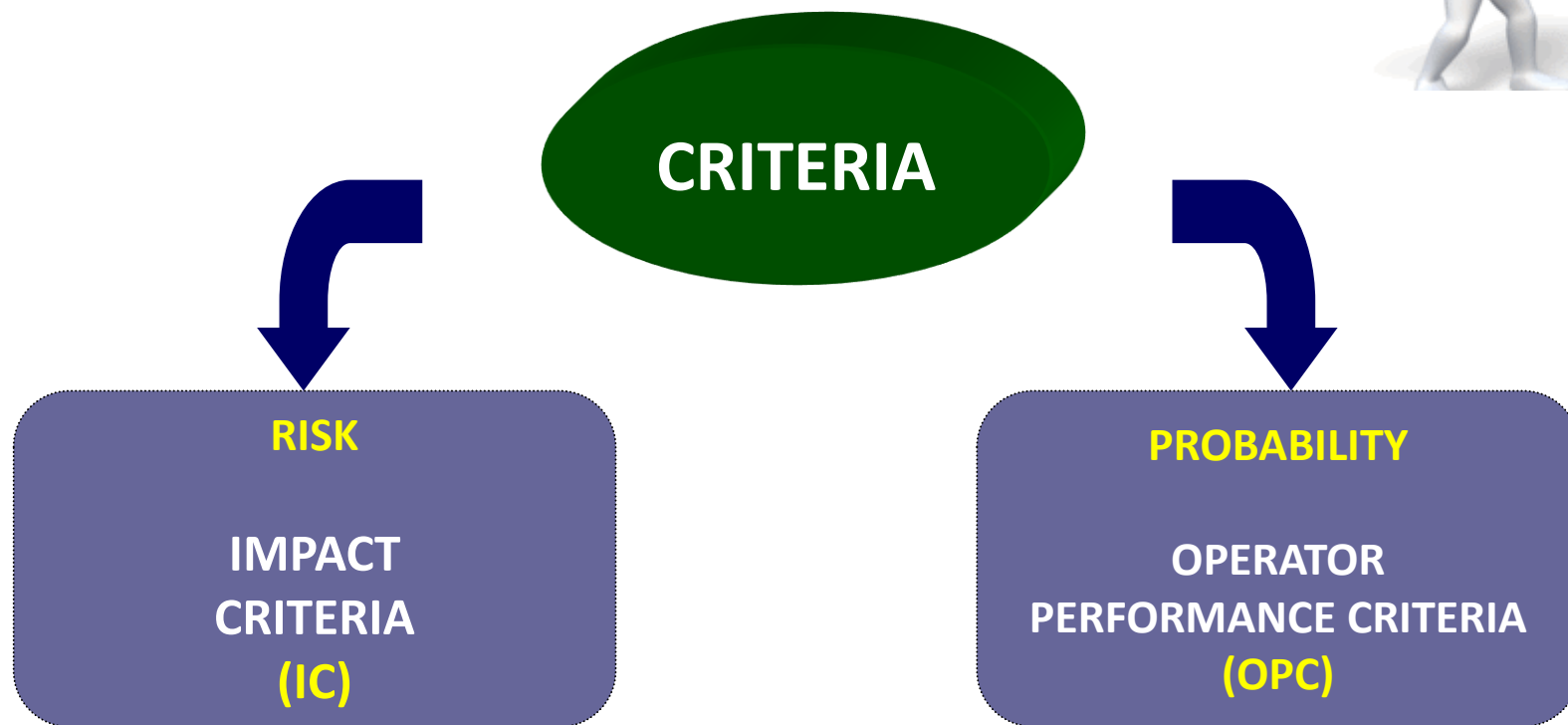
IRAM is based on 4 principles

- The inspection frequency is determined by the value of the highest score;
- The inspection frequency is reduced by one step if the set of minimum number of highest scores is not met;
- The inspection frequency can be changed by only one step up or down based on Operator Performance Criteria (OPC);
- The higher the sum of scores, the longer the inspection time.



# IRAM

## DEVELOPMENT OF RISK ANALYSIS SYSTEMS





### The Characteristics of the IC

- ☐ Normally varies between “0” and “5”;
- ☐ Accounts the severity of the consequence and the vulnerability of the receptor.

### The Characteristics of the OPC

- ☐ Assumes the values of “-1”, “0”, or “1”;
- ☐ Accounts the influence of the operator on the receptor.

# IRAM

## THE STEPS OF IRAM



- 1 - Define the IC and OPC;
- 2 - Define the weighting factors and terms;
- 3 - Define “the Rule”;
- 4 - Classify the risk categories;
- 5 - Set the legal obligations and policy;
- 6 - Define the weighting factors for inspections;
- 7 - Fill in IC scores;
- 8 - Fill in the OPC scores.

# IRAM

## An example

IC Seveso – Type of activity developed in the establishment



Description	Value of activity
Unknown	0
Warehousing	1
Transfer or filling reservoirs and / or vessels in Standard Temperature and Pressure (STP)	1
Transfer or filling reservoirs and / or vessels without STP	2
Production of mixes or other unit operations (physical process)	2
Processes with chemical reaction	3

Designation of operator	Type of activity	Value
1	Warehousing	1
2	Warehousing + Transfer with STP + production of mixes	$1+1+2=4$
3	Warehousing + Transfer without STP + chemical reactions	$1+2+3=6$

# IRAM

## *An example*

IC Seveso – Type of activity developed of the establishment



Value of the activity	IC
0	0
1	1
2 or 3	2
4, 5 or 6	3
7 or 8	4
9	5

Designation of operator	Value	IC
1	1	1
2	4	3
3	6	3

# IRAM

## An example

OPC Seveso – Compliance with legislation



Description	Value of OPC
Inspected operator without an infringement in the last inspection	-1
Operator never inspected under Seveso Directive	0
Inspected operator with an infringement in the last inspection or other legal measures	1

Designation of operator	Inspection	Value
1	Not inspected	0
2	Inspected with a legal infringement	1
3	Inspected without a legal infringement	-1

# IRAM

## UNIVERSE OF INSTALLATIONS

Model	Number of installations
<b>SEVESO</b>	195 <sup>(1)</sup>
<b>Global</b>	227 <sup>(2)</sup>
<b>IED</b>	699 <sup>(1)</sup>
<b>WWTP</b>	555 <sup>(1)</sup>
<b>TFS</b>	104 <sup>(3)</sup>
<b>WEEE</b>	605 <sup>(1)</sup>
<b>REACH</b>	235 <sup>(4)</sup>

<sup>(1)</sup> Values based on IRAM's databases systems;

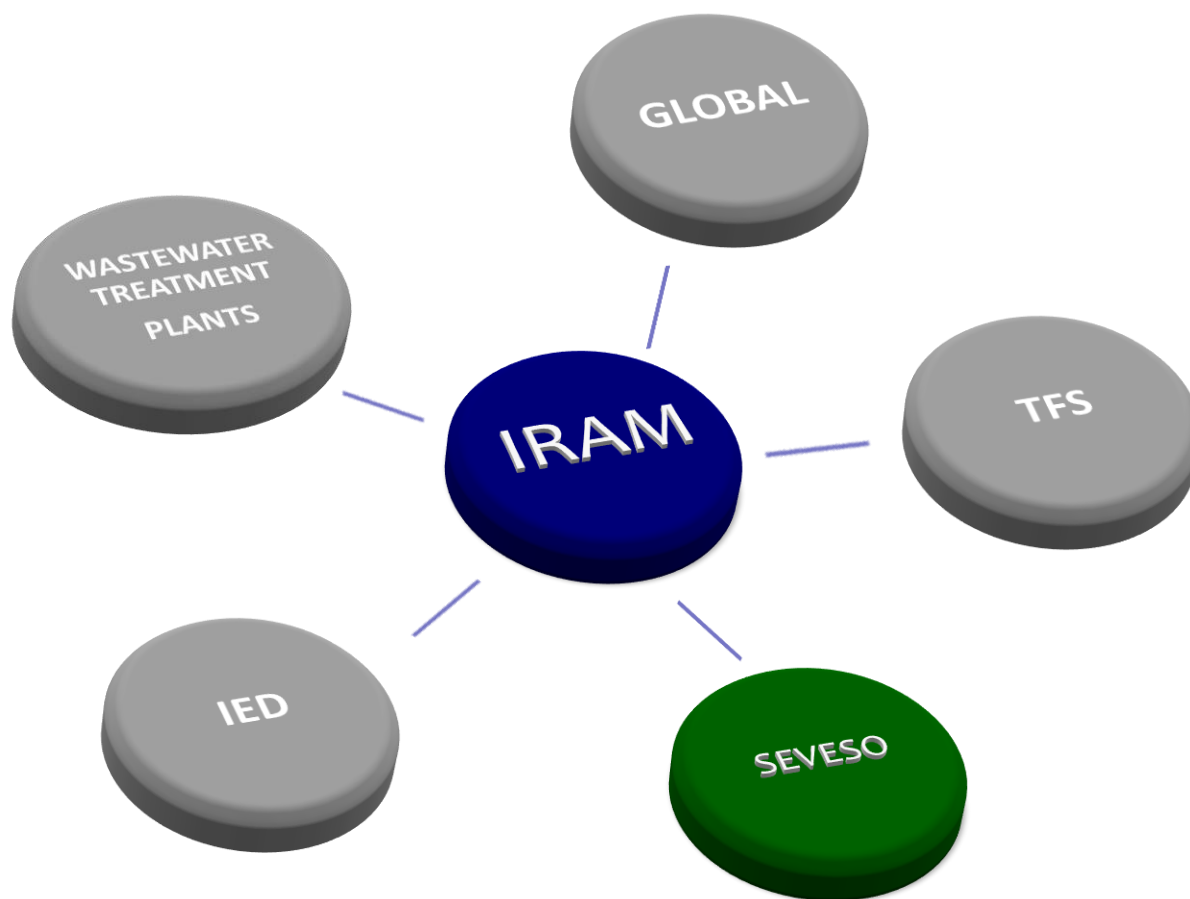
<sup>(2)</sup> Number of installations regarding metalworking, pig farms, EMAS installations;

<sup>(3)</sup> This is an estimated value;

<sup>(4)</sup> Number of installations regarding paint, varnish, glue, cleaning products and plastic producers.

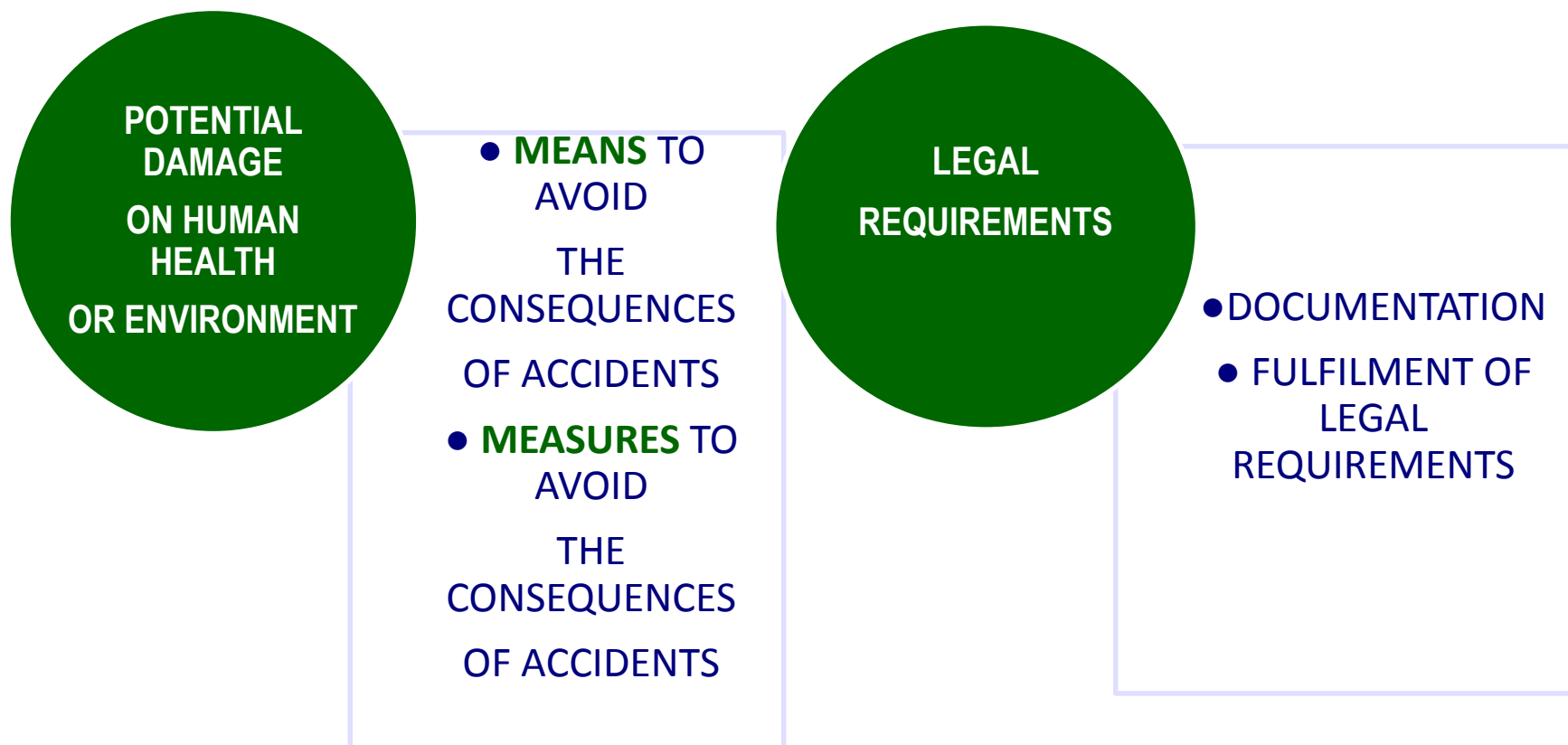
# IRAM

## RISK ANALYSIS SYSTEM BY IRAM TOOL - IGAMAOT





## SEVESO RISK ANALYSIS SYSTEM - DRIVING FORCES





#### DANGEROUS SUBSTANCES

(HEALTH  
HAZARDOUS  
SUBSTANCES)

- Addition of dangerous substances listed in part 2 of annex I of Seveso Directive that fall within acute toxicity category 1, 2 or 3 or STOT SE category 1, together with dangerous substances falling within section H, entries H1 to H3 of part 1 of Seveso Directive.

#### DANGEROUS SUBSTANCES

(PHYSICAL  
HAZARDOUS  
SUBSTANCES)

- Addition of dangerous substances listed in part 2 of annex I of Seveso Directive that are explosives, flammable gases, liquids or aerosols, oxidizing gases or liquids, self reactive substances, organic peroxides, pyrophoric liquids and solids, together with substances falling within section P entries P1 to P8 of part 1 of Seveso Directive.

# IRAM

## IMPACT CRITERIA - SEVESO

### Criteria/Indicator - continuation



#### **DANGEROUS SUBSTANCES** (ENVIRONMENTAL IMPACT SUBSTANCES)

- Addition of dangerous substances listed in part 2 of annex I of Seveso Directive that fall within environment acute category 1, chronic category 1 or 2, together with dangerous substances falling within section E, entries E1 and E2 of part 1 of Seveso Directive.

#### **DANGEROUS SUBSTANCES** (OTHER HAZARDOUS SUBSTANCES)

- Addition of dangerous substances falling within section H, entries O1 to O3 of part 1 of Seveso Directive.

# IRAM

## IMPACT CRITERIA - SEVESO

### Criteria/Indicator - continuation



#### **DANGEROUS SUBSTANCES** (TOTAL DANGER OF HAZARDOUS SUBSTANCES)

- Addition of values of IC's regarding the health, physical, environment and other hazardous substances.

#### **PROCESS RISKS, COMPLEXITY OF INSTALLATIONS** (INDUSTRIAL PROCESS)

- This criterion evaluates the type of industrial process that's used with Seveso substances.
- 4 types of process: storage; racking (with or without NTP conditions), production of mixtures and chemical reaction.

# IRAM

## IMPACT CRITERIA - SEVESO

### Criteria/Indicator - continuation



**SENSITIVITY OF  
THE LOCAL  
ENVIRONMENT**  
(LOCATION OF THE  
ESTABLISHMENT)

- This criterion is function of national planning systems (*CORINE land cover and areas covered by the national system of protected areas*)

**NEIGHBOURHOOD  
SEVESO  
ESTABLISHMENTS OR  
OTHER CONDITIONS  
THAT CAN CAUSE  
DANGER**  
(NUMBER OF  
ESTABLISHMENTS WITH  
DOMINO EFFECT)

- This criterion takes into account the domino effect in LTE or UTE establishments.

# IRAM

## IMPACT CRITERIA - SEVESO

### Criteria/Indicator - continuation

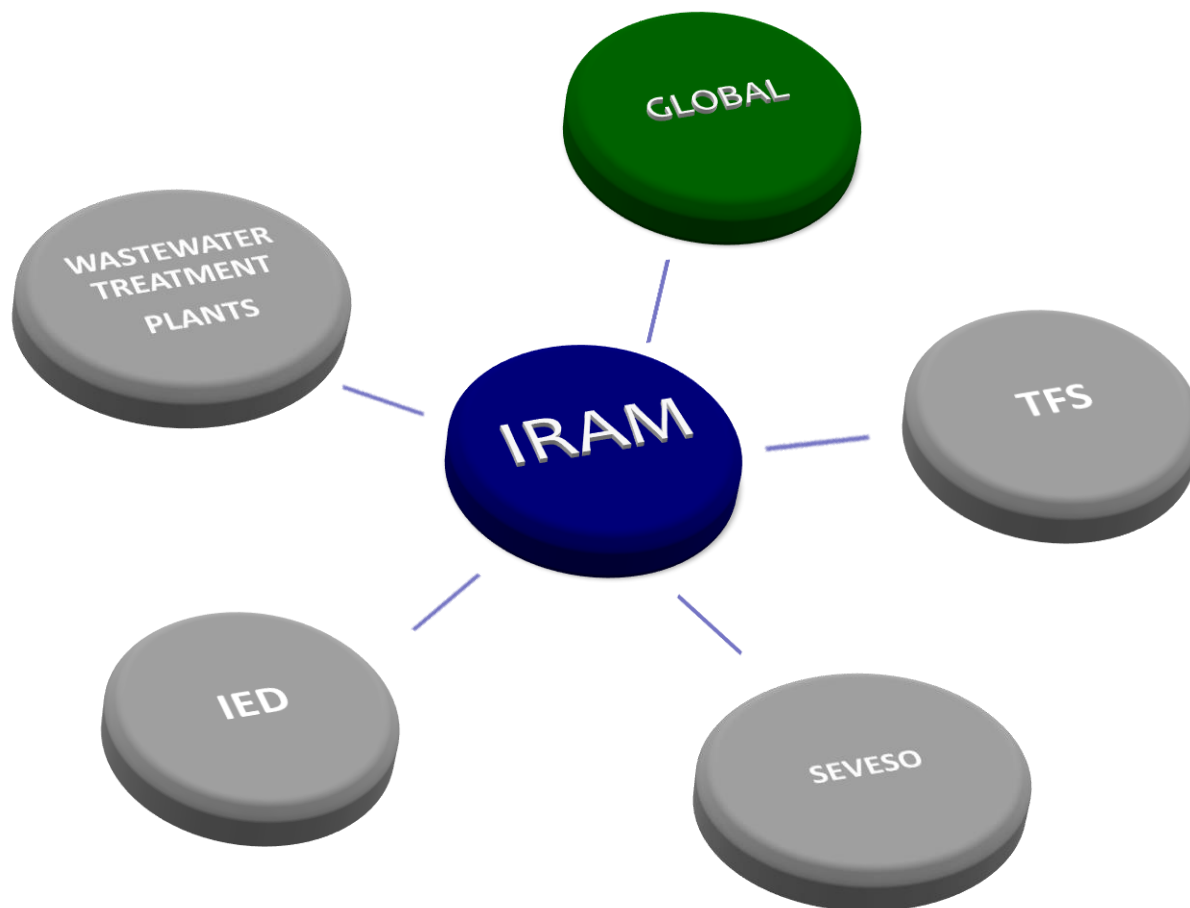


**SENSITIVE OBJECTS  
AND CONDITIONS IN  
THE  
NEIGHBOURHOOD  
(VULNERABLE  
ELEMENTS)**

- Defined distance to Vulnerable elements (residential areas, schools, kindergartens, hospitals, flood areas, drinking water catchment areas, nature conservation areas), whether is a LTE or UTE establishment.

# IRAM

## RISK ANALYSIS SYSTEM BY IRAM TOOL - IGAMAOT



## GLOBAL RISK ANALYSIS SYSTEM - DRIVING FORCES

NOT APPLIED  
TO THESE  
SYSTEMS

- ❖ SEVESO
- ❖ IED
- ❖ URBAN  
WASTEWATER  
TREATMENT  
PLANTS
- ❖ TFS
- ❖ WEEE

REQUIREMENTS

- ❖ DEFINE  
CRITERIA TO  
COVER THE  
LARGEST  
NUMBER OF  
OPERATORS
- ❖ VERIFY  
INFORMATION  
IN OFFICIAL  
SOURCES



# IRAM

## IMPACT CRITERIA - GLOBAL

### Criteria/Indicator



#### RELEASES TO AIR (ATMOSPHERIC EMISSIONS)

- This criterion depends on emitted pollutants and monitoring frequency

#### IMPACT ON SOIL AND GROUNDWATER (REJECTIONS FOR SOIL AND WATER)

- This criterion is related to the verification of wastewater rejections to the water and / or soil, carried out by the installation and the existence of permit, license or concession to use of the water resources for such discharges

# IRAM

## IMPACT CRITERIA - GLOBAL

### Criteria/Indicator - continuation



#### OFF-SITE TRANSFER OF WASTE (ANNUAL WASTE PRODUCTION)

- This criterion evaluates the annual quantity of total waste produced and hazardous waste generated by the installation

#### SENSITIVITY OF THE LOCAL ENVIRONMENT (MUNICIPALITY WHERE THE INSTALLATION IS LOCATED)

- This criterion is a function of population density

# IRAM

## IMPACT CRITERIA - GLOBAL

### Criteria/Indicator - continuation



**SENSITIVITY OF  
THE LOCAL  
ENVIRONMENT**  
(LOCATION OF THE  
ESTABLISHMENT)

- This criterion is function of national planning systems (*CORINE land cover* and areas covered by the national system of protected areas)

**TYPE AND KIND  
OF  
INSTALLATION**  
(NUMBER OF  
EMPLOYEES AND  
TURNOVER)

- This criterion is function of number of employees and/or turnover of installation

# IRAM

## IMPACT CRITERIA - GLOBAL

### Criteria/Indicator - continuation



#### TYPE AND KIND OF INSTALLATION (ACTIVITY SECTOR)

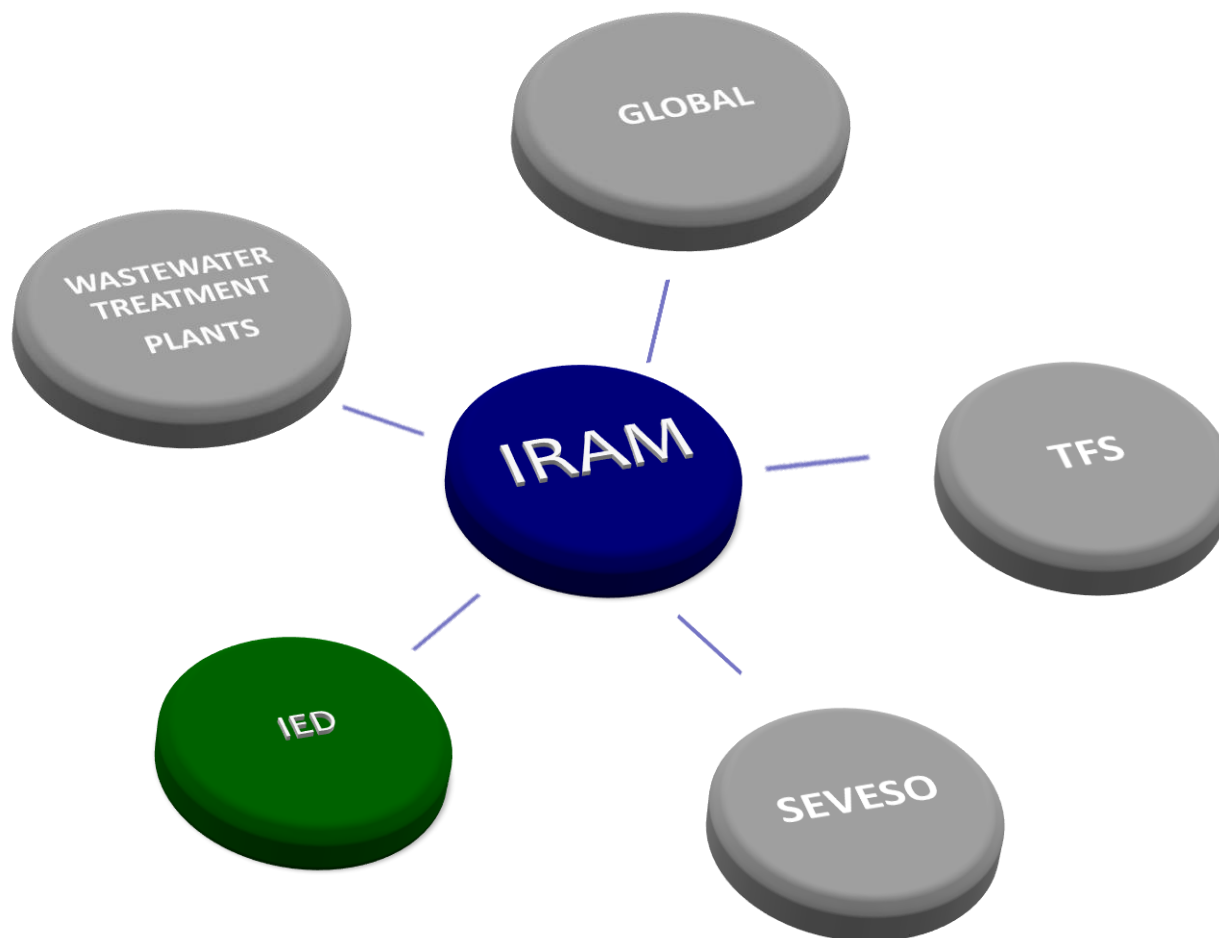
- This criterion is function of the activity sector where installation operates, and compares their predominance in sectors of the IGAMAOT database

#### TYPE AND KIND OF INSTALLATION (COMMUNITY FUNDS)

- This criterion evaluates if the installation benefits from EU funds such as the European Regional Development Fund

# IRAM

## RISK ANALYSIS SYSTEM BY IRAM TOOL - IGAMAOT



# IRAM

## IED RISK ANALYSIS SYSTEM - DRIVING FORCES

### PREVENT REDUCE ELIMINATE POLLUTION FROM INDUSTRIAL ACTIVITIES

- The **potential** impacts taking into account the levels and types of emissions
- The **actual** impacts taking into account the levels and types of emissions

### REQUIREMENTS

- Participation of the operator in the Union eco-management and audit scheme (EMAS)
- Record of compliance with permit conditions

# IRAM

## IMPACT CRITERIA - IED

### Criteria/Indicator



#### TYPE AND KIND OF INSTALLATION

- Dimension and complexity
- Activity that is mentioned in the table “Classificação do nível de atividade PCIP” (Rating complexity level of IED activities)

#### RELEASES TO AIR (EMISSIONS TO AIR)

- Presence of an emission to air and sum of ratio of releases to threshold value in column 1a of Annex II of EPRTR

# IRAM

## IMPACT CRITERIA - IED

### Criteria/Indicator - continuation



#### RELEASES TO WATER (EMISSIONS TO WATER)

- Presence of an emission to water and sum of ratio of releases to threshold value in column 1b of Annex II of EPRTTR

#### RELEASES TO LAND (EMISSIONS TO SOIL)

- Presence of an emission to land and sum of ratio of releases to threshold value in column 1c of Annex II of EPRTTR



# IRAM

## IMPACT CRITERIA - IED

### Criteria/Indicator - continuation



#### INPUT OF WASTE (HAZARDOUS AND NON-HAZARDOUS WASTE QUANTITY)

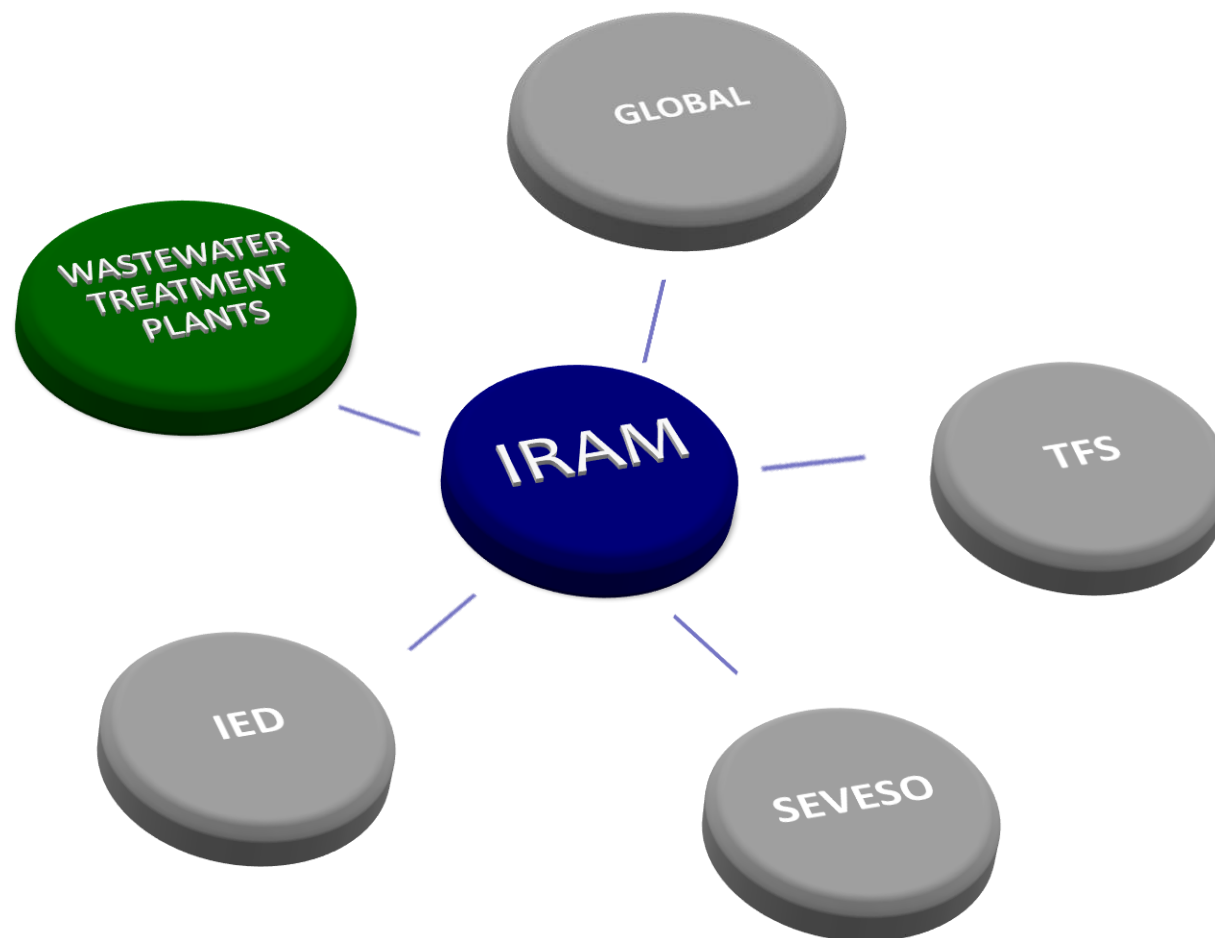
- Waste quantity, divided in hazardous and non-hazardous, and shipment from foreign countries

#### SENSITIVITY OF THE LOCAL ENVIRONMENT (LOCATION OF THE ESTABLISHMENT)

- This criterion is function of national planning systems (*CORINE land cover* and areas covered by the national system of protected areas)

# IRAM

## RISK ANALYSIS SYSTEM BY IRAM TOOL - IGAMAOT





# **IRAM**

## **WWTP RISK ANALYSIS SYSTEM - DRIVING FORCES**

**PROTECTION  
OF WATER  
RESOURCES**

**PROMOTION OF  
GOOD ECOLOGICAL  
STATUS (or a  
minimum of good  
chemical status)  
FULLY OPERATIONAL  
24/7, 365 DAYS**

**HIGH LEVEL OF  
EFFICIENCY**

**LEGAL  
REQUIREMENTS  
GOOD  
MAINTENANCE  
GOOD  
OPERATION**

# IRAM

## IMPACT CRITERIA - WWTP

### Criteria/Indicator



#### TYPE AND KIND OF INSTALLATION (ESTABLISHMENT'S AGE)

- Highly intensive use, lifelong expectancy between 20-30 years (*to consider Changes on legal requirements and short time to achieve it under the WFD*)

#### TYPE AND KIND OF INSTALLATION (TYPE OF TREATMENT)

- Level of technology on dimensioning and through lifetime of equipment (*to consider Changes on legal requirements and short time to achieve it under the WFD*)

# IRAM

## IMPACT CRITERIA - WWTP

### Criteria/Indicator - continuation



#### SENSITIVITY OF THE LOCAL ENVIRONMENT (STATUS OS WATER BODY)

- Water status defined under the WFD (*to consider Changes on legal requirements and short time to achieve it under the WFD*)

#### TYPE AND KIND OF INSTALLATION (EQUIVELENT POPULATION)

- The bigger it gets the worst is the potential for environmental impact (*size matters as far as to be included under PRTR*)

# IRAM

## IMPACT CRITERIA - WWTP

### Criteria/Indicator - continuation

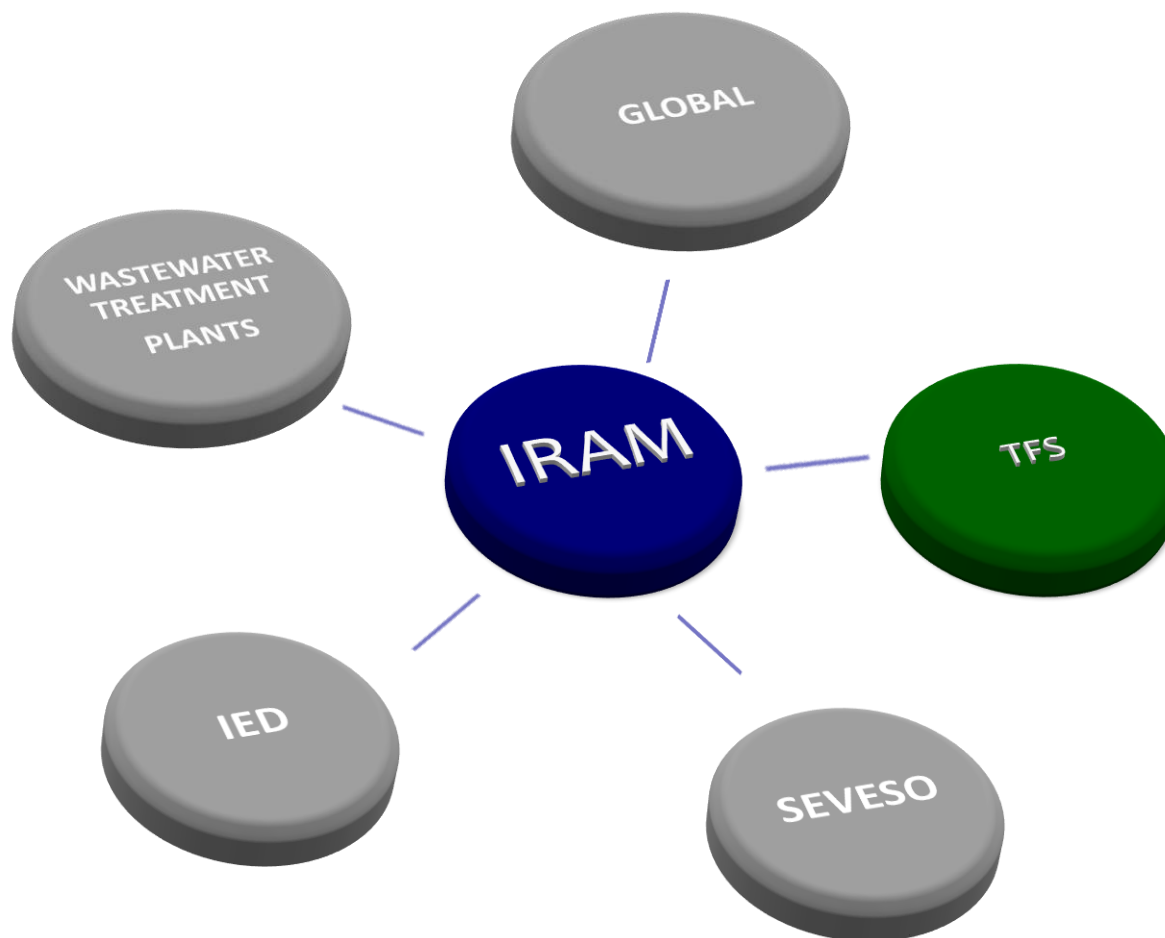


#### SENSITIVITY OF THE LOCAL ENVIRONMENT (LOCATION OF THE ESTABLISHMENT)

- Based on land use cartography in a GIS tool, where defined 6 classes of environment sensitive land use classes
- Usually located on sensitive areas
- More important on consolidated urban sites

# IRAM

## RISK ANALYSIS SYSTEM BY IRAM TOOL - IGAMAOT



# IRAM

## TFS RISK ANALYSIS SYSTEM - DRIVING FORCES



### APPLIED TO

- Specific waste streams and sources of illegal shipments;
- Intelligence-based data;
- Analysis of criminal activities.

### REQUIREMENTS

- ❖ Verification of documents;
- ❖ Confirmation of identity;
- ❖ Physical checking of the waste
- ❖ Place of shipment



# IRAM

## IMPACT CRITERIA - TFS

### Criteria/Indicator



#### Type of packaging of waste

- This criterion pretends to evaluate the risk associated with the packaging type and material, in storage, handling and transportation of waste – it must meet the proper physical and chemical requirements, regarding the waste that it will hold.

#### Classification and hazardous properties of waste/waste stream

- This criterion intends to measure the hazardous properties of waste/waste streams, which largely determine whether there is an environmental risk in case of unauthorized or irresponsible treatment. Based on information regarding the last 3 years of waste/waste streams imported by Portugal.

# IRAM

## IMPACT CRITERIA - TFS

### Criteria/Indicator



#### Amount of waste imported

- This is a magnitude criterion, where the amount of waste imported by the operator is measured. The quantity of waste imported is an indicator of the likelihood that environmental damage will occur. The greater the flow the greater the likelihood that such an impact will occur.
- It also takes into account the hazardous properties of the imported waste.

#### Transfer / Treatment method

- This criterion intends to reflect the risks of transfer, handling and treatment method.
- It also takes into account the number of players involved. If the waste is transported/handled through a number of links in the chain, there is less transparency in the process and higher risk.



OPERATOR PERFORMANCE CRITERIA			
1	Compliance with legislation	8	Safety management system audit
2	Inspection frequency	9	Accidents / incidents
3	Notice of violation	10	Safety management system for prevention of severe accidents
4	Number of complaints	11	Organization and personal
5	Environmental management systems	12	Maintenance
6	Inspection recommendations	13	Origin of the TFS
7	Fire safety measures		

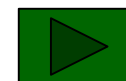


# IRAM

## OPERATOR PERFORMANCE CRITERIA - OPC



SYSTEMS/ OPC	GLOBAL	SEVESO	IED	WWTP	TFS
1	✓	✓	✓	✓	✓
2	✓				
3	✓				
4	✓				✓
5	✓	✓	✓	✓	✓
6		✓			
7		✓			
8		✓			
9	✓	✓	✓	✓	
10		✓			
11		✓			
12				✓	
13					✓



# IRAM

## OPC - EXAMPLE



### CRITERIA

COMPLIANCE WITH LEGISLATION

### DEFINITION

This criteria checks if violations were detected in the last integrated inspection

### SCORE

Without violations (-1)  
Without inspection (0)  
At least one violation(+1)

# IRAM

## OPC – EXAMPLE (continuation)



### CRITERIA

#### ENVIRONMENTAL MANAGEMENT SYSTEMS

### DEFINITION

This criteria checks if the operator has a certified management system

### SCORE

- ✓ With certified environmental management system **(-1)**
- ✓ No evidence of existence of certified environmental management system **(0)**
- ✓ Without environmental management system **(+1)**

# IRAM

## OPC – EXAMPLE (continuation)



### CRITERIA

#### NUMBER OF ACCIDENTS / INCIDENTS

### DEFINITION

This criteria checks for accidents or incidents in the last three years

### SCORE

- ✓ Without accidents or incidents or with accidents or incidents without consequences **(-1)**
- ✓ Without accidents or incidents with moderate consequences, serious or very serious **(0)**
- ✓ With at least an accident with moderate consequences, serious or very serious **(+1)**

# EXPECTATIONS



- Implementation of risk analysis systems is part of IGAMAOT's 2015 annual activity plan

is intended to be more effective to the planning of the inspection activity,

in order to focus the intervention of IGAMAOT to installations that present a higher risk

and account human, financial and logistical resources, trying to adopt procedures and clear objectives.

- IGAMAOT plans to improve data input by establishing IT connections with the databases of other authorities (e.g., The Portuguese Environmental Agency) and by developing a single integrated platform.
- Share the information with operators in order to improve environmental performance.



## **CONTACTS**

# **THANK YOU FOR YOUR ATTENTION**

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