



Les nouveautés de la version 2.0 par rapport aux versions précédentes (1.3)

- Ecran “Structure” :
 - Possibilité d'utiliser les dimensions d'un bâtiment standard ayant une forme de parallélépipède avec une possible tour, comme précédemment
 - Ou utilisation des véritables dimensions de la structure avec un outil de design simple et intégré

File ?

Structure type

Select structure type

industrial

Structure
shielding☒ None☐ Mesh☐ Continuous

Structure with LPS



Class

Pb

Special characteristics

☐ Meshed bonding network complying to IEC 62305-4☒ Building with metal structure or continuous reinforced concrete framework acting as a natural down-conductor system☐ Elements used as natural down-conductor system☐ Building with metal roof and☐ Elements used as natural

Collection area

Location factor

surrounding

☒ Analytic calculation

Collection area

A (m)

22

B (m)

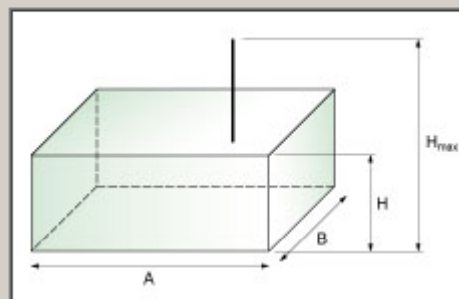
32

H (m)

15

 H_{max} (m)

18



OK

Cancel

al down-conductor system

as a part of a building

Data

Collection Area A_d (km²)Collection area A_m (km²)

OK

Structure type

Select structure type

industrial

Structure
shielding☒ None☐ Mesh☐ Continuous

Structure with LPS



Class

Pb

Special characteristics

☐ Meshed bonding network complying to IEC 62305-4☒ Building with metal structure or continuous reinforced concrete framework acting as a natural down-conductor system☐ Elements used as natural LPS component.☐ Building with metal roof and structure or continuous reinforced concrete framework acting as a natural down-conductor system☐ Elements used as natural LPS component.

Collection area

Location factor

surrounded by smaller objects

Structure as a part of a building

Data

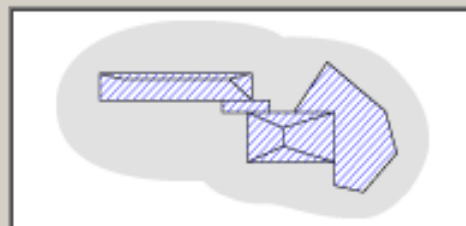
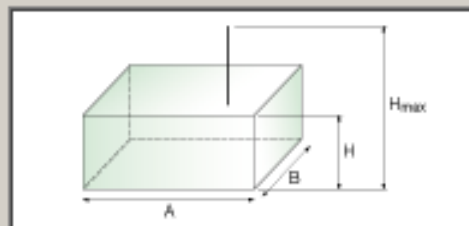
☐ Analytic calculation

Data

☒ Graphic
calculation

Draw

Calculation

Collection Area A_d (km²)Collection area A_m (km²)

OK



New

Save and
exit

Select

Bring to
back

Rectangle



Polygon



Circle



Delete



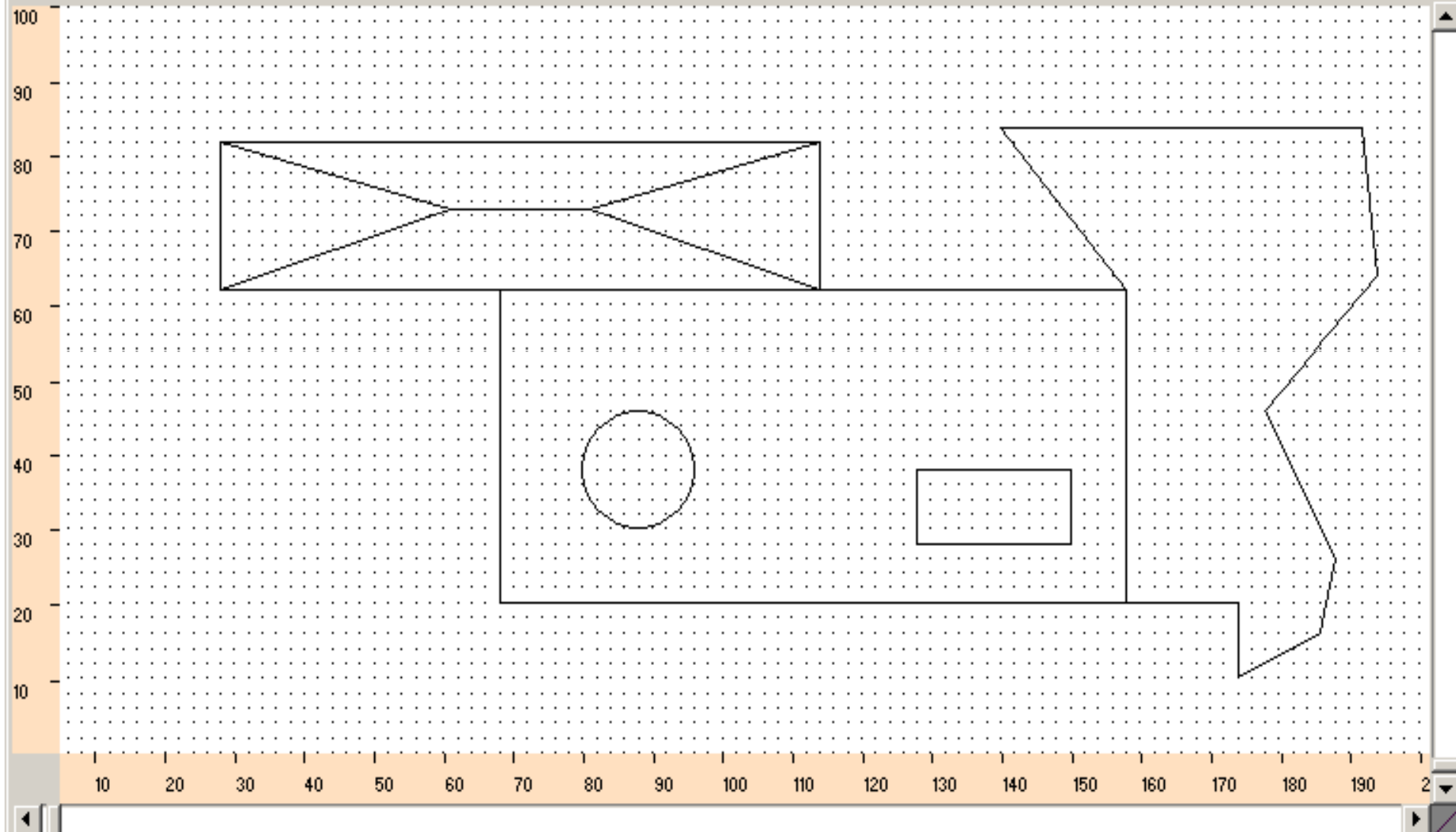
Roof



Zoom



Grid



X: 119 m

Y: 96 m



New

Save and
exit

Select

Bring to
back

Rectangle



Polygon



Circle



Delete



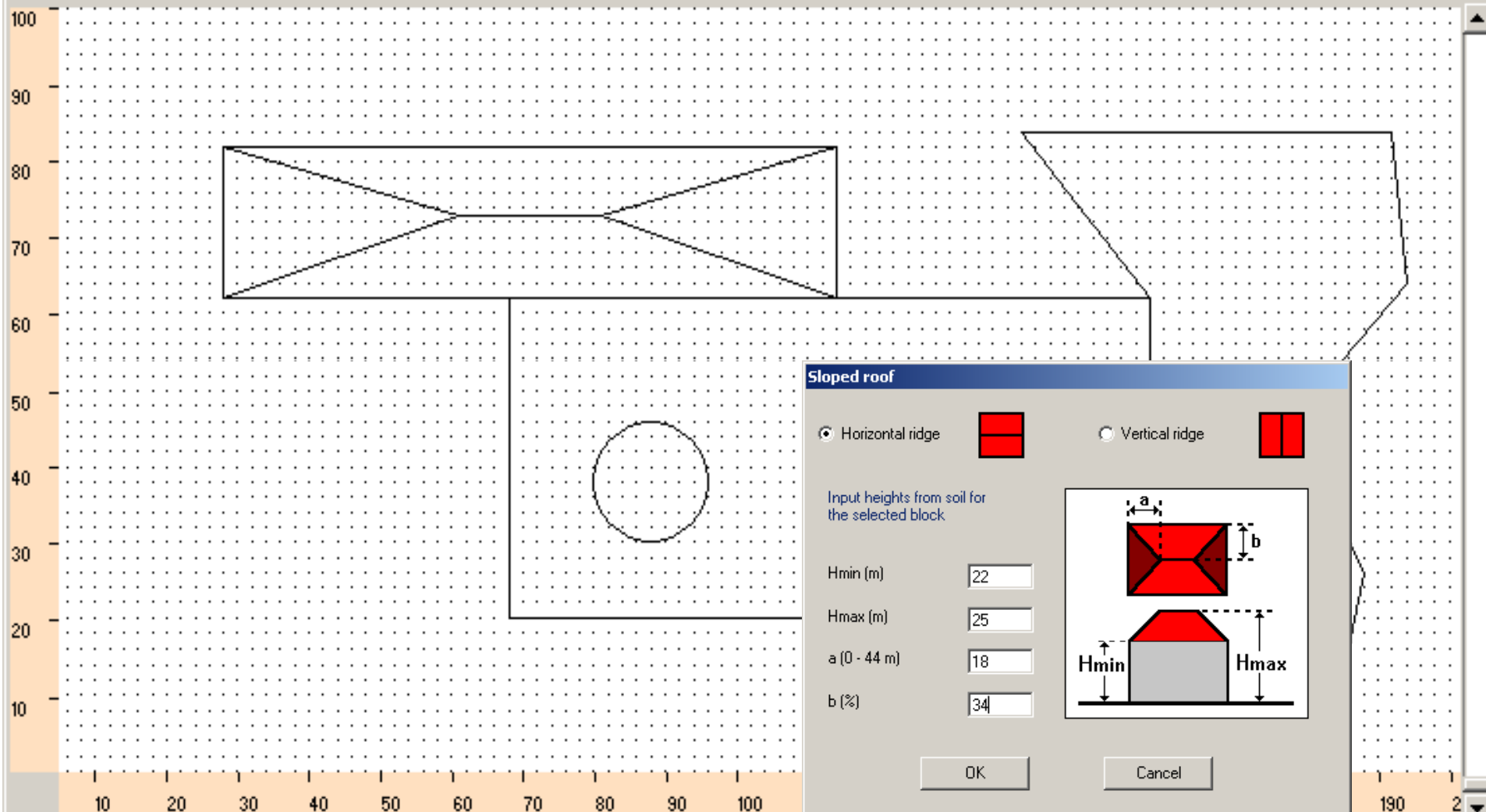
Roof



Zoom



Grid



Sloped roof

☒ Horizontal ridge☐ Vertical ridgeInput heights from soil for
the selected block

Hmin (m)

22

Hmax (m)

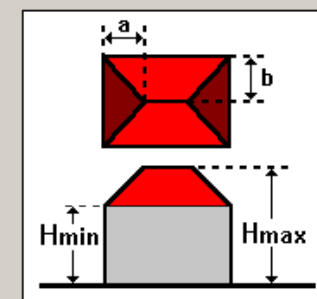
25

a (0 - 44 m)

18

b (%)

34



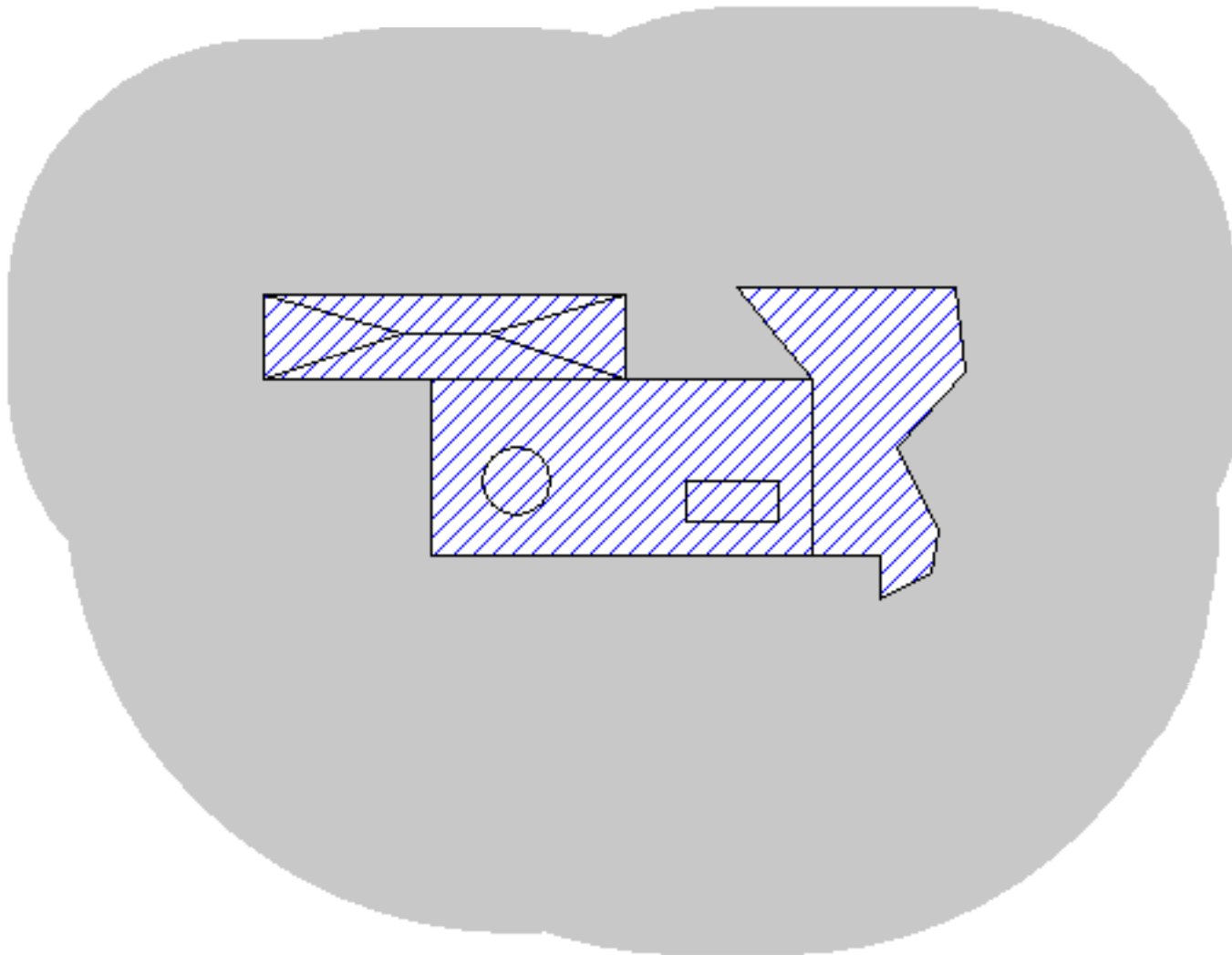
OK

Cancel

X: 119 m

Y: 96 m

Calcul et tracé des surfaces Ad et Am



Collection Area Ad (km²) :

5,51E-02

Collection area Am (km²) :

3,14E-01

Show Ad

Show Am

Export image

Exit

- Ecran “Lignes” :
 - Possibilité d'utiliser les lignes standard (aérienne, souterraine, HTA, BT ou data), comme précédemment
 - Ou description de la véritable ligne (aéro-souterraine, avec transformateur en ligne ...)

Line name

Power aerial

☒ Standard line☐ Custom line

Connected lines

N.	Name
L1	Power aerial
L2	Power mixed
L3	Telecom

Select line type

power - aerial



Building

☒ Adjacent structure

A (m) 10

B (m) 15

H (m) 8

Location factor

isolated

Characteristics of the connected line

Length (m)

780

Height above ground (m)

6

Shielding

none

☐ Shield not bonded to eqp. bar
to whom equip. is connected

Location factor

surrounded by higher objects

Environmental factor

suburban (h < 10 m)

SPD at line entrance

none

Pspd

1

Help

New

Delete

Change

OK

Cancel

Line name

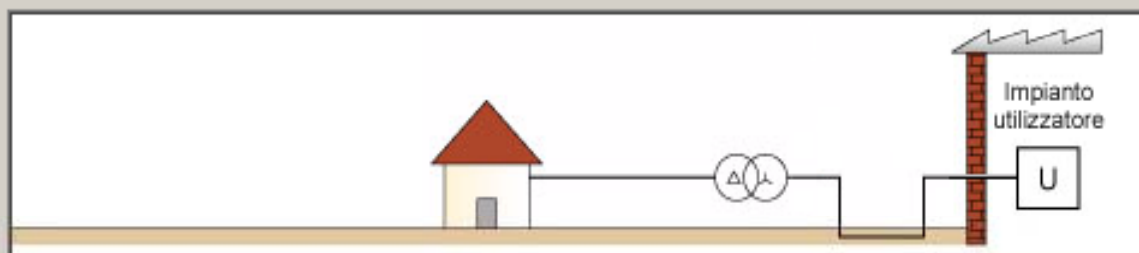
Power mixed

☐ Standard line☒ Custom line

Connected lines

N.	Name
L1	Power aerial
L2	Power mixed
L3	Telecom

Input structure's value. Drag and drop icons to arrange the line



Data

Data

Data

Data

Lengths

Length (m) : 600,00

Useful length (m) : 543,00

Collection areas

Due to flashes to a service Ai (km²) : 0,016924

Due to flashes near a service Ai (km²) : 0,500000

Adjacent structure Ada (km²) : 0,002585

New

Delete

Change

OK

Cancel

JUPITER

- Ecran “Zones” :
 - Traitement simplifié des zones multiples

File ?

Zone definition

☒ Multiple zones ☐ Single zone

Zone name

Office

Zones list

N.	Name
Z1	External
Z2	Office
Z3	Production

New

Delete

Change

Characteristics

Internal systems

Risk components

Loss values

Zone type

☐ outside☒ inside☒ Presence of persons☐ Risk of explosion (zone 0)

Help

Special hazard

Low panic level

Risk of fire

ordinary

Risk of fire
evaluation

Fire protections

☐ none☒ manual☐ automatic

Zone shielding

☒ none☐ mesh☐ continuous

Ground surface type

Linoleum

Protection against
touch voltage☒ no protection☐ warning notices☐ elt insulation☐ physical restrictions☐ soil equipotentialisation

OK

Cancel

Zone definition

☒ Multiple zones ☐ Single zone

Zones list

N.	Name
Z1	External
Z2	Office
Z3	Production

New

Delete

Change

Outil unique et spécifique de calcul
du risque incendie basé sur les
données des sapeurs pompiers

Characteristics

Internal systems

Risk components

Loss values

Zone type

☐ outside☒ inside☒ Presence of persons☐ Risk of explosion (zone 0)

Help

Special hazard

Low panic level

Risk of fire

ordinary

Risk of fire
evaluation

Fire protections

☐ none☒ manual☐ automatic

Zone shielding

☒ none☐ mesh☐ continuous

Ground surface type

Linoleum

Protection against
touch voltage☒ no protection☐ warning notices☐ elt insulation☐ physical restrictions☐ soil equipotentialisation

OK

Cancel

Risk of fire evaluation

To evaluate specific load

Zone's total

Type of structure (MJ/m²)

machine shop
machine shop, turning
machineries and toolmakers exhibition
making of wooden agglomerated panels
man-made fibre production

Mass material (MJ/kg)

acetaldehyde
acetate polyvinyl
acetone
acetylene (in cylinders melted 17 MJ/lt)
acetylene gas (57 MJ/m³)

Volume material (MJ/m³)

natural fibre - other
natural fibre - coconut
natural rough rubber
natural rubber things
natural rubber, foam blocks

Number of pieces (MJ/pz)

kitchens chair
kitchens table (metallic legs)
kitchens wooden table
library (a m² surface, content included)
metallic writing desk

Double click to remove a line from the table

Elements that concur to determine fire load	Piece value	Area (m²)	Volume (m³)	Mass (kg)	Number of pieces
acetate polyvinyl	21 (MJ/kg)			870	
acetaldehyde	25 (MJ/kg)			500	
library (a m² surface, content included)	837 (MJ/pz)				500
natural rough rubber	28500 (MJ/m³)		2000		
machineries and toolmakers exhibition	90 (MJ/m²)	3000			

57719270 MJ

3136916,8 kg

Specific load fire (MJ/m²)

7214,91

Specific load fire (kg/m²)

392,11

Risk of fire

High

OK

Cancel

Outil unique et spécifique de calcul du risque incendie basé sur les données des sapeurs pompiers

File ?

Zone definition

☒ Multiple zones ☐ Single zone

Zone name

Office

Zones list

N.	Name
Z1	External
Z2	Office
Z3	Production

New

Delete

Change

Characteristics

Internal systems

Risk components

Loss values

Loss values input procedure:

☐ Manual

R1

Guide

Lf

2,50E-01

Lo

1,25E-01

Lt

2,50E-02

Loss value calculation - risk 1

Number of possible endangered persons (victims) due to:

physical damages to the structure

30

failure of internal systems

20

touch and step voltages

5

Expected total number of persons in the structure

70

Time in hours per year for which the persons are present in the dangerous place, inside the structure

8760

Cancel

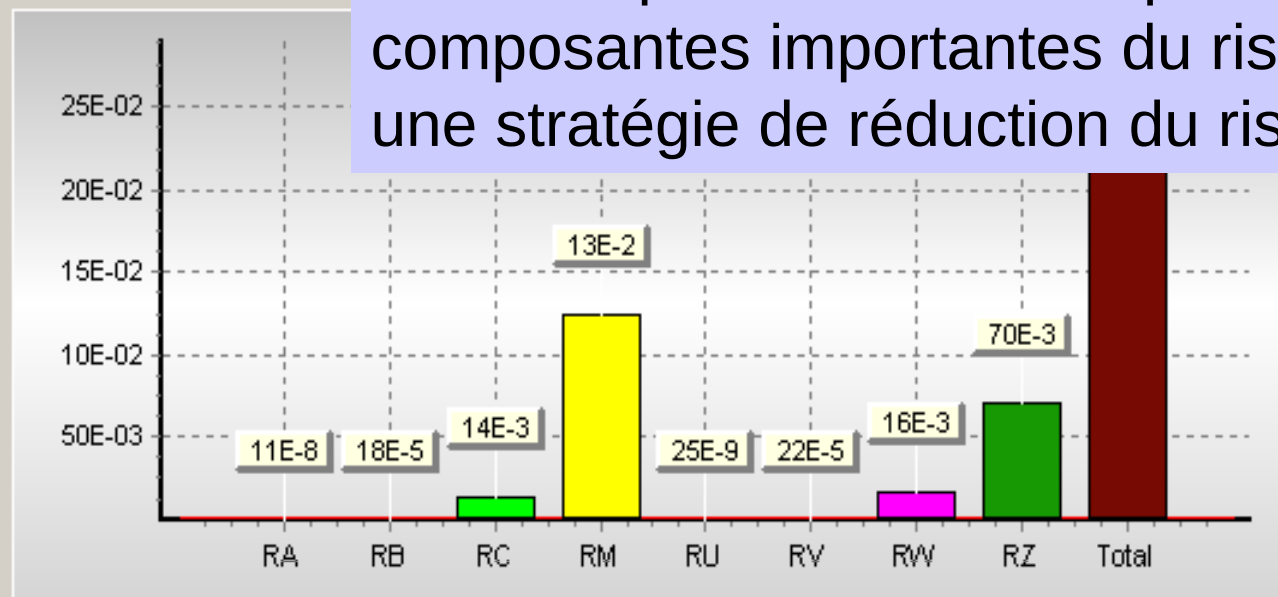
Loss value calculation

OK

Cancel

Visualisation par histogramme du risque de la structure pour identifier simplement les composantes importantes du risque et donc établir une stratégie de réduction du risque

Structure risk

☐ Risk 4☐ Protection measures☒ No protection measures**Protection measures needed**

Structure and collection area ✓

Connected lines ✓

Zones ✓

Protection measures selection

Economic evaluation

SPD selection

Projects list

Project data

P001 - METALPHA Sa - industrial design -

Structure

Connected lines

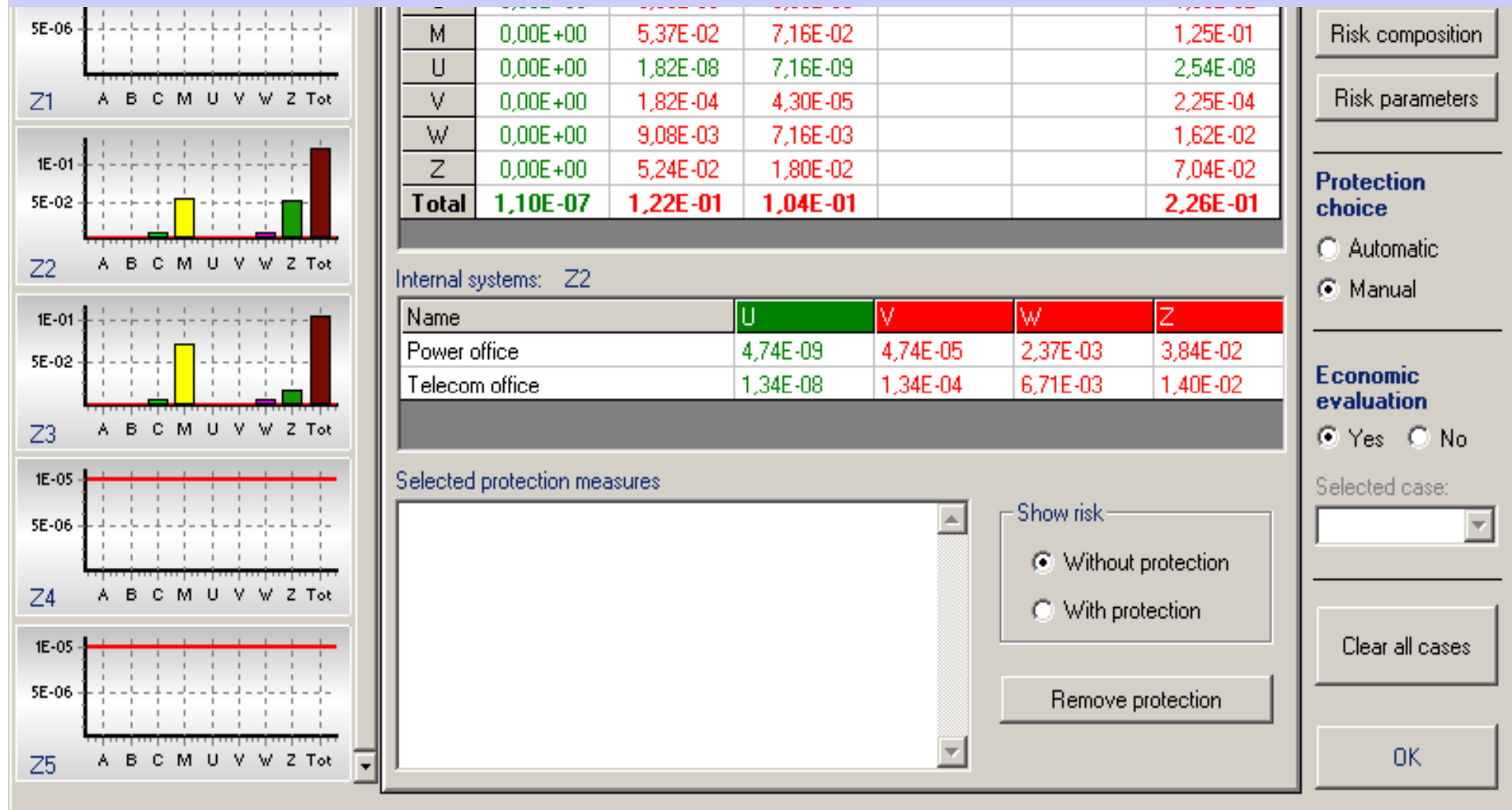
Zones

Calculations

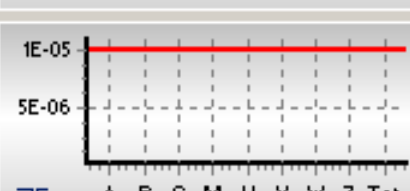
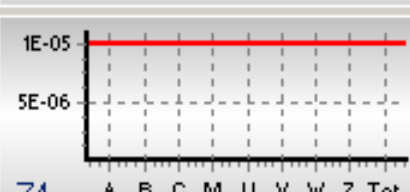
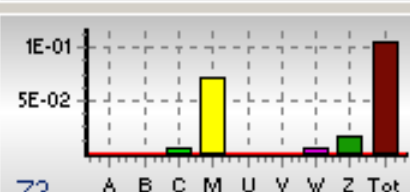
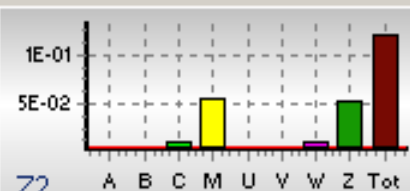
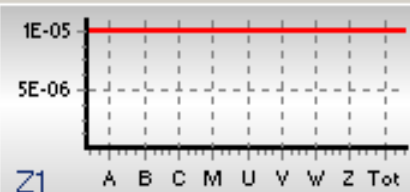
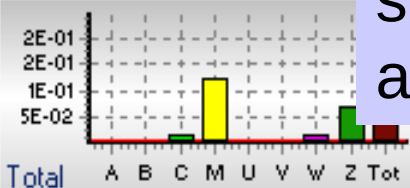
Prot. measures

- Lightning flashes frequency
Ng (flashes/year km²): 2
- Structure type: industrial
- Location factor: surrounded by smaller objects
- Shielding: No shield
- Collection area
Dimensions: refer to annex
Collection area Ad (km²): 5,51E-02
Collection area Am (km²): 3,14E-01
- Special characteristics:

Visualisation par histogramme du risque de chaque zone complétée par un tableau avec code couleur (rouge : pas protégé, vert protégé) pour identifier simplement les composantes importantes du risque et donc établir une stratégie de réduction du risque adaptée à chaque zone



Outil de détermination automatique d'une solution de protection basé sur une stratégie adaptée à chaque utilisateur



	Z1	Z2	Z3	Z4	Z5	Structure
A	1,10E-07	0,00E+00	0,00E+00			1,10E-07
B	0,00E+00	6,89E-06	2,07E-06			8,96E-06
C	0,00E+00	6,89E-06	6,89E-06			1,38E-02
M	0,00E+00					1,25E-01
U	0,00E+00					5,09E-10
V	0,00E+00					4,51E-06
W	0,00E+00					1,62E-02
Z	0,00E+00					7,04E-02
Total	1,10E-07					2,26E-01

Case 1 - Protection measures priority

Double click on a protection measure to modify its level of priority

		Enable
1	LPS	☒
2	SPD at line entrance	☒
3	Manual fire protection	☒
4	Automatic fire protection	☒
5	Coordinated SPD	☒
6	Wiring	☒
7	Withstand voltage	☒
8	Shielding	☒
9	Touch and step voltage	☒
10	Type of surface	☒

OK

Cancel

Internal systems:

Name

Selected protection meas:

Common protection measures:
LPS class: II (Pb = 0,05)

Line1: Power aerial
SPD at line entrance: level II
Line2: Power mixed
SPD at line entrance: level II
Line3: Telecom
SPD at line entrance: level II

Show risk

- ☐ Without protection
☒ With protection

Remove protection

☐ Risk 3

☐ Risk 4

Risk composition

Risk parameters

Protection choice

- ☒ Automatic
☐ Manual

Economic evaluation

- ☒ Yes ☐ No

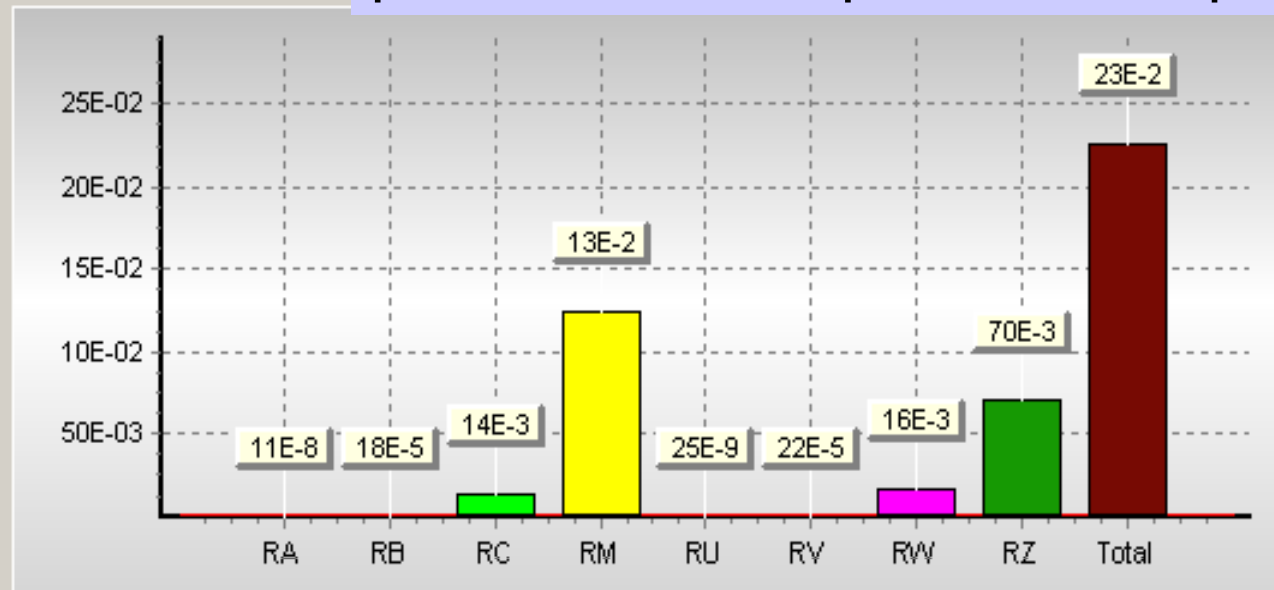
Selected case:

Clear all cases

OK

Possibilité d'optimiser les solutions par calcul du risque économique

Structure risk



Project data

P001 - METALPHA Sa - industrial design -

Structure

Connected lines

Zones

Calculations

Prot. measures

- Lightning flashes frequency
Ng (flashes/year km²): 2
- Structure type: industrial
- Location factor: surrounded by smaller objects
- Shielding: No shield
- Collection area
Dimensions: refer to annex
Collection area Ad (km²): 5,51E-02
Collection area Am (km²): 3,14E-01
- Special characteristics:

☒ Risk 1

☐ Risk 2

☐ Risk 3

☐ Risk 4

☐ Protection
measures

☒ No protection
measures

Protection measures needed

Structure and collection area ✓

Connected lines ✓

Zones ✓

Protection measures selection ✓

Economic evaluation

SPD selection

Projects list

Outil d'aide pour le calcul économique

Structure and contents value

Protection measures cost

Case 1

Case 2

Case 3

Case 4

Case 5

Zone	Loss without protection (€)	Loss with protection (€)	Protection cost (€)	Zone saving (€)
Z1 - External	0,00	0,00	0,00	0,00
Z2 - Office	0,00	0,00	0,00	0,00
Z3 - Production	0,00	0,00	0,00	0,00

Total	0,00	0,00	0,00	0,00
-------	------	------	------	------

Common protection cost (LPS and/or SPD at entrance line) (€)

0,00

Total saving (€)

0,00

Case	Annual protection cost	Saving (€)
Case 1	To evaluate	To evaluate
Case 2	To evaluate	To evaluate
Case 3	To evaluate	To evaluate
Case 4	To evaluate	To evaluate
Case 5	To evaluate	To evaluate

Selected case

case 1

Help

OK

Structure and contents value

Protection measures cost

Case 1

Zone

Z1 - External

Z2 - Office

Z3 - Production

Total

Price list

To modify a cost input the new value in the corresponding cell

Description	Unit of measure	Cost (€)
LPS		
meshed air-termination (installed)	m	21
down-conductors (installed)	m	25
type B earth termination	m	70
vertical earth termination (deep-driven and connected)	each	60
platform renting (18 m height)	h	47
platform renting (34 m height)	h	54
platform renting (42 m height)	h	64
scaffolding renting	h	3
equipotential bonding bar	each	300
equipotential connections	each	15
MEASURES TO REDUCE THE CONSEQUENCE OF FIRE		
fire extinguishers system	m³	0,35
fire hydrants system	m³	0,3
manual alarm installation	m³	0,5
manually operated extinguishing installation	m³	1,15

OK

Cancel

Case 5

one saving (€)

0,00

0,00

0,00

0,00

0,00

0,00

Case	Annual protection cost	Saving (€)
Case 1	To evaluate	To evaluate
Case 2	To evaluate	To evaluate
Case 3	To evaluate	To evaluate
Case 4	To evaluate	To evaluate
Case 5	To evaluate	To evaluate

Selected case

case 1

Help

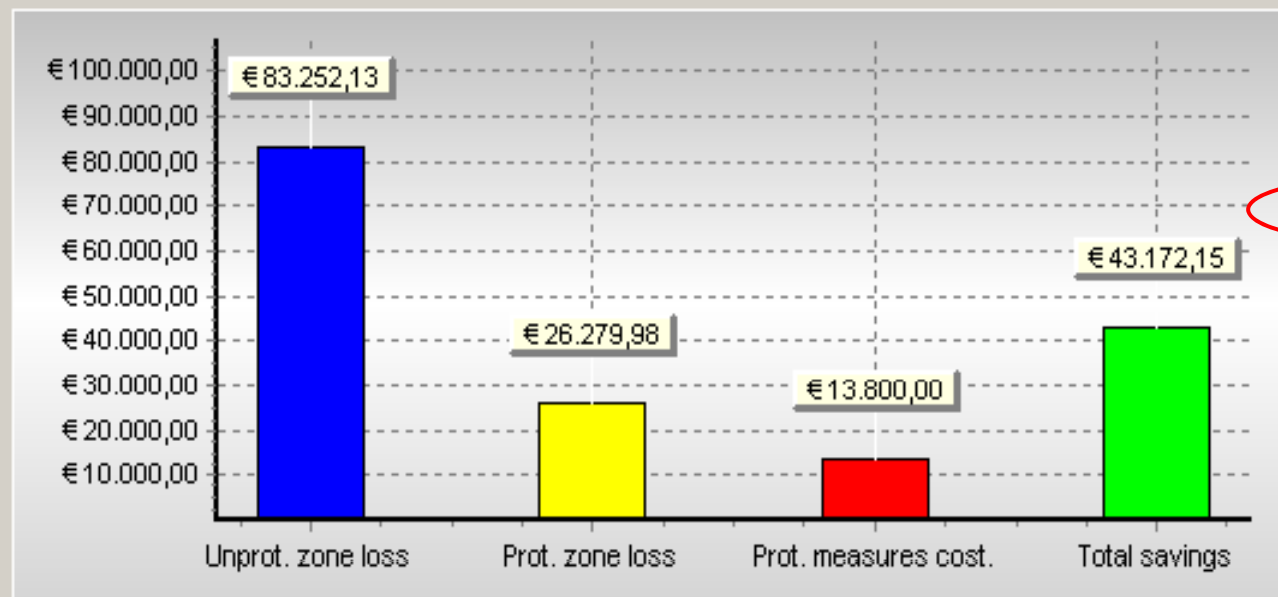
OK

Détermination du prix complet du SPF sur la base d'une liste de prix proposée modifiable par l'utilisateur

Détermination de la solution la plus économique



Economic evaluation

☐ Risk 1☐ Risk 2☐ Risk 3☒ Risk 4☒ Protection measures☐ No protection measures

Protection is cost effective

Structure and collection area ✓

Connected lines ✓

Zones ✓

Protection measures selection ✓

Economic evaluation ✓

SPD selection

Projects list

Project data

P001 - METALPHA Sa - industrial design -

Structure

Connected lines

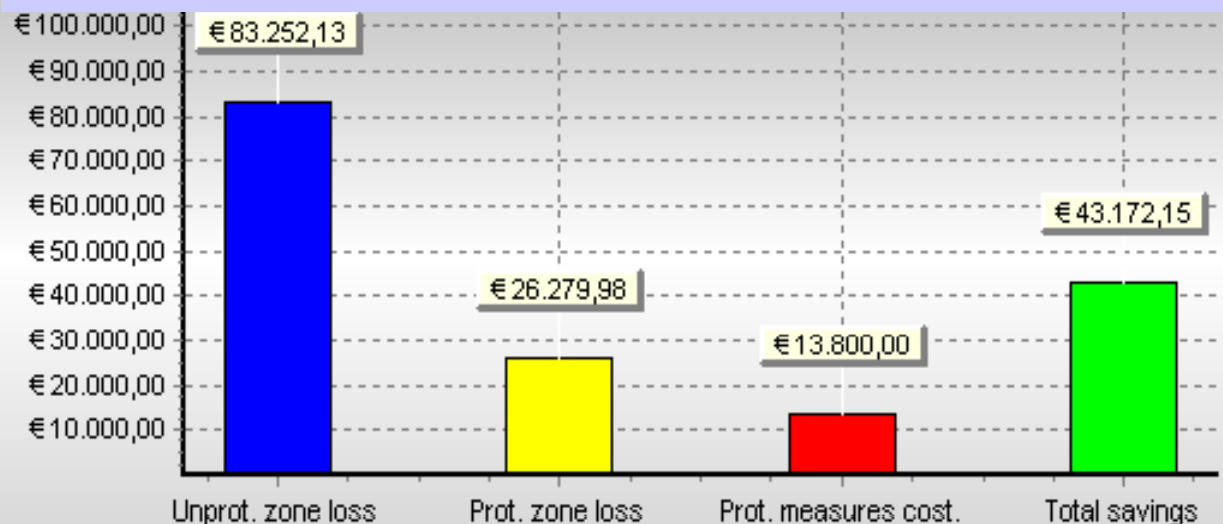
Zones

Calculations

Prot. measures

- Lightning flashes frequency
Ng (flashes/year km²): 2
- Structure type: industrial
- Location factor: surrounded by smaller objects
- Shielding: No shield
- Collection area
Dimensions: refer to annex
Collection area Ad (km²): 5,51E-02
Collection area Am (km²): 3,14E-01
- Special characteristics:

Outil additionnel: choix des parafoudres selon EN 62305-4 (possibilité d'utiliser cet outil sans faire le calcul de risque)



☐ Risk 2

☐ Risk 3

☒ Risk 4

☒ Protection measures

☐ No protection measures

Protection is cost effective

Structure and collection area ✓

Connected lines ✓

Zones ✓

Protection measures selection ✓

Economic evaluation ✓

SPD selection

Projects list

Project data

P001 - METALPHA Sa - industrial design -

Structure

Connected lines

Zones

Calculations

Prot. measures

- Lightning flashes frequency
Ng (flashes/year km²): 2
- Structure type: industrial
- Location factor: surrounded by smaller objects
- Shielding: No shield
- Collection area
Dimensions: refer to annex
Collection area Ad (km²): 5,51E-02
Collection area Am (km²): 3,14E-01
- Special characteristics:

Première étape : définition de l'installation électrique

Electrical system :

Power system :

Line to neutral voltage (V) :

Power is supplied by a transformer HV/LV with earth electrode in common with the building ? ☐ Yes ☒ No

Safety coefficient for equipment :

Is the line that supplies the installation shielded ? ☒ Yes ☐ No

Section (mm²) :

Material :

The connected line is : ☒ a cable insulated from the soil or in air
☐ a cable with the screen in contact with the soil

Distance between the structure and the closest earthing point of the screen (m) :

Input minimum impulse withstand voltage of installed equipments (V) :

Conductor section (mm²) :

Current I_{cond} that flows in each line conductor (kA) :

Information about internal systems supplied by the line for which coordinated SPD has been selected

Zone	Name	Wiring	Uw (kV)	SPD level	ks2
Z3	Power production	Loop area in the order of 50 m ²	2.5	III	1.0

OK

Deuxième étape : définition du TGBT et des tableaux divisionnaires

Board
or circuit
properties

Delete

Clear all

■ Data not
complete

■ Data
complete

Board (3° level)

Name of board (3° level):

Board (3° level)

Distance between the Board (2° level) and the Board (3° level) (m):

33

Entering line characteristics

Type of line:

3F + N

☐ All routing inside a shielded zone

Ks2 =

☐ Metal continuous conduit

- ☐ Loop area in the order of 50 m²
- ☐ Loop area in the order of 10 m²
- ☐ Loop area in the order of 0,5 m²
- ☒ Shielded cable $R \leq 1 \text{ ohm/km}$
- ☐ Shielded cable $1 < R \leq 5 \text{ ohm/km}$
- ☐ Shielded cable $5 < R \leq 20 \text{ ohm/km}$

The Board (3° level) how many boards (4° level) supplies ?

2

Does the board supplies directly (without intermediate boards) any final circuit ? ☒ Yes ☐ No

Final circuits characteristics

All the final circuit have the same withstand voltage ?

☐ Yes ☒ No

Help

Number of different withstand voltage

2

	Withstand voltage (V)	Type of line.	L max (m)	Wiring
Circuit 1 :	2500	F - N	12	Data
Circuit 2 :	4000	3F + N	27	Data

OK

Cancel

Dessin automatique du schéma unifilaire à partir des données entrées

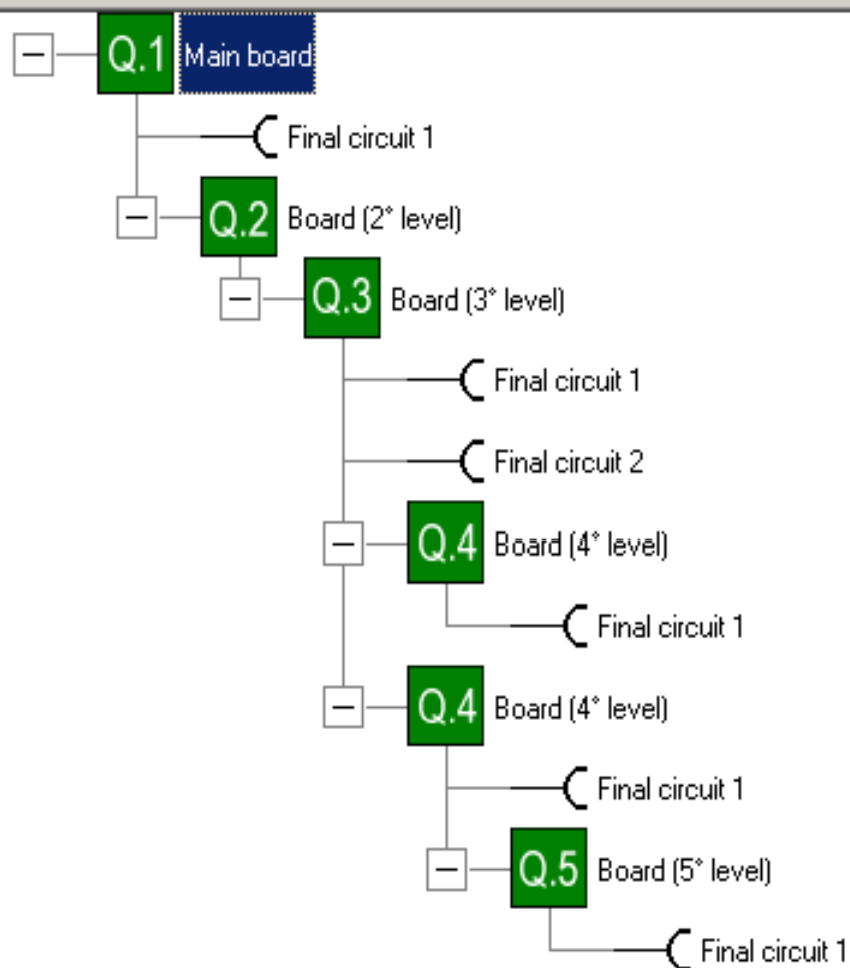
Board
or circuit
properties

Delete

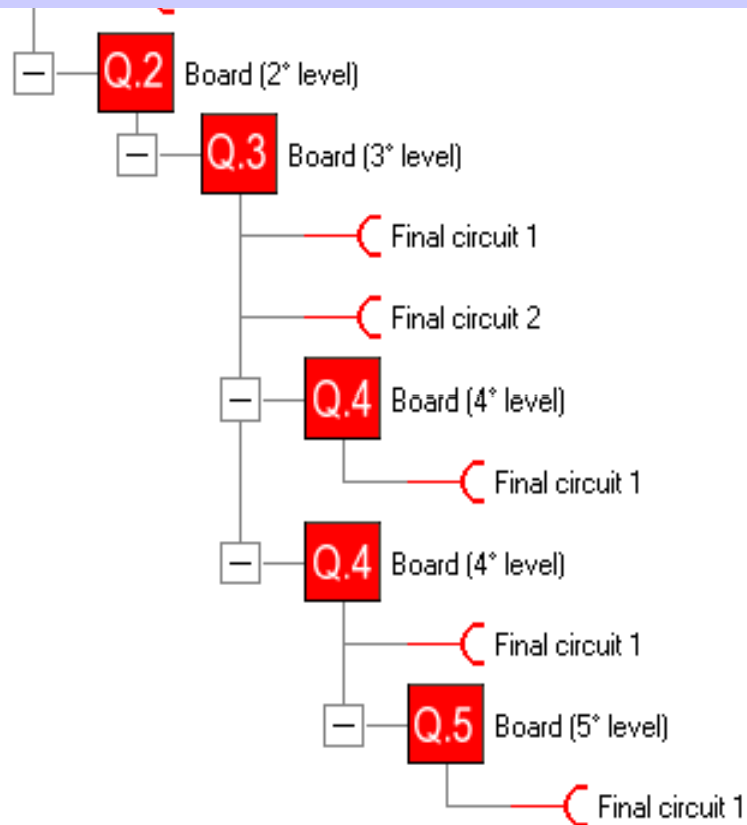
Clear all

■ Data not
complete

■ Data
complete



Les tableaux ou équipements en rouge sont non protégés, ceux en bleu protégé par un parafoudre dédié au tableau ou à l'équipement et en bleu protégé par un parafoudre amont (distance de protection)



Remove SPD

Safety coefficient verification

Circuit protection verification

Remove all SPD

NOT protected

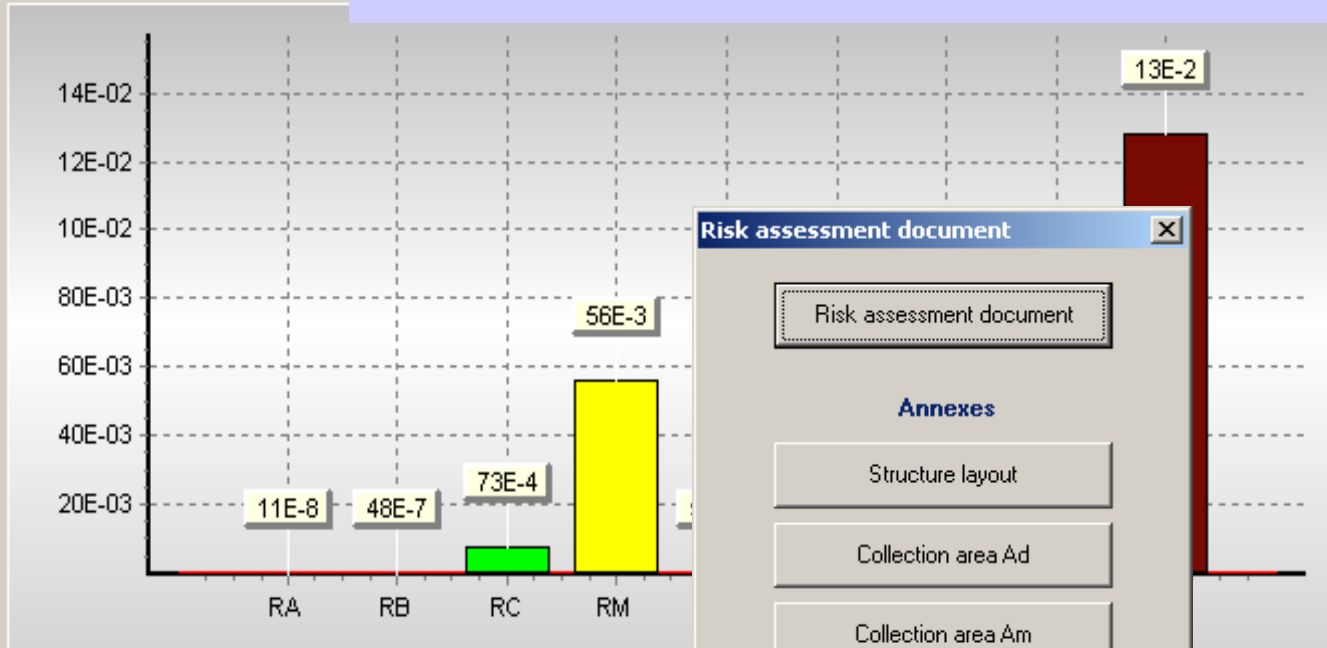
Protected

SPD installed

Legend

Etablissement d'un rapport en mode texte complet et illustré

Structure risk



Project data

P001 - METALPHA Sa - industrial design -

Structure

Connected lines

Zones

Selected protection measures: case 1

Common protection measures:
LPS class: II (Pb = 0,05)

Zone Z2: Office
Fire protections: Automatic
Zone Z3: Production
Internal system: Power production
Coordinated SPD: level III

Risk assessment document

Risk assessment document

Annexes

Structure layout

Collection area Ad

Collection area Am

SPD installation

Exit

Risk 1

☐ Risk 2

☐ Risk 3

☐ Risk 4

☒ Protection measures

☐ No protection measures

Protection measures needed

Structure and collection area ✓

Connected lines ✓

Zones ✓

Protection measures selection ✓

Economic evaluation ✓

SPD selection ✓

Projects list

Etablissement d'un rapport en mode texte complet et illustré

