



**JUPITER**

# Jupiter 2.0 et 2.2

## Spécificités

# ***JUPITER***

The logo features the word "JUPITER" in a bold, italicized, red font with a white outline. It is set against a dark purple background with a white lightning bolt striking down from the top right.

- Version 2.0 : basée sur l'édition 1 (2006) de la norme EN 62305-2
- Version 2.2 : basée sur l'édition 2 (2010 IEC 2012 CENELEC) de la norme EN 62305-2

# JUPITER



- 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-conductors
- Building with metal roof and walls acting as a natural down-conductor system
  - Elements used as natural down-conductors

### Collection area

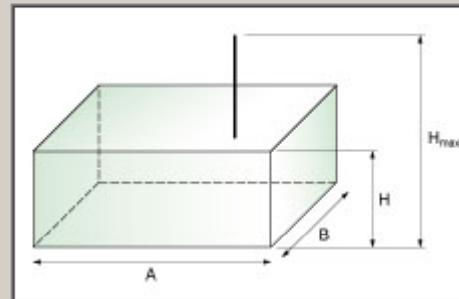
Location factor

surr

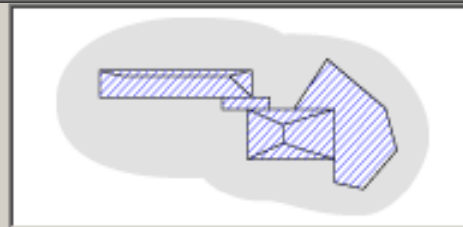
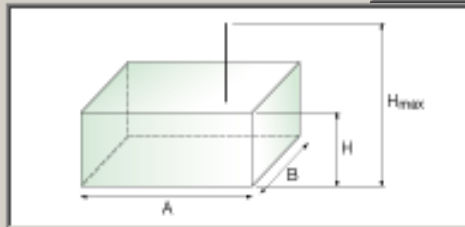
Analytic calculation

#### Collection area

A (m)   
B (m)   
H (m)   
H<sub>max</sub> (m)



OK Cancel



al down-conductor system

as a part of a building

Data

Collection Area Ad (km<sup>2</sup>)

Collection area Am (km<sup>2</sup>)

OK

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 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

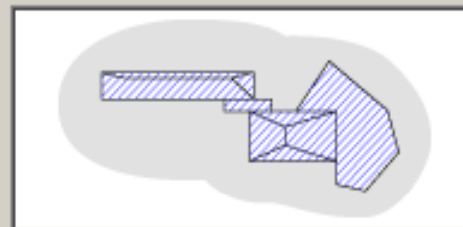
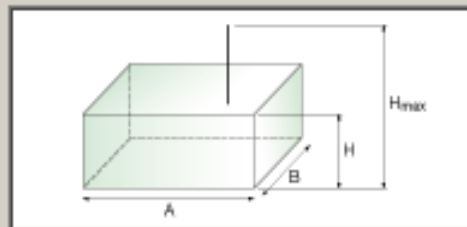
Graphic calculation

Draw

Calculation

Collection Area  $A_d$  (km<sup>2</sup>)

Collection area  $A_m$  (km<sup>2</sup>)



OK



New



Save and exit



Select



Bring to back



Rectangle



Polygon



Circle



Delete



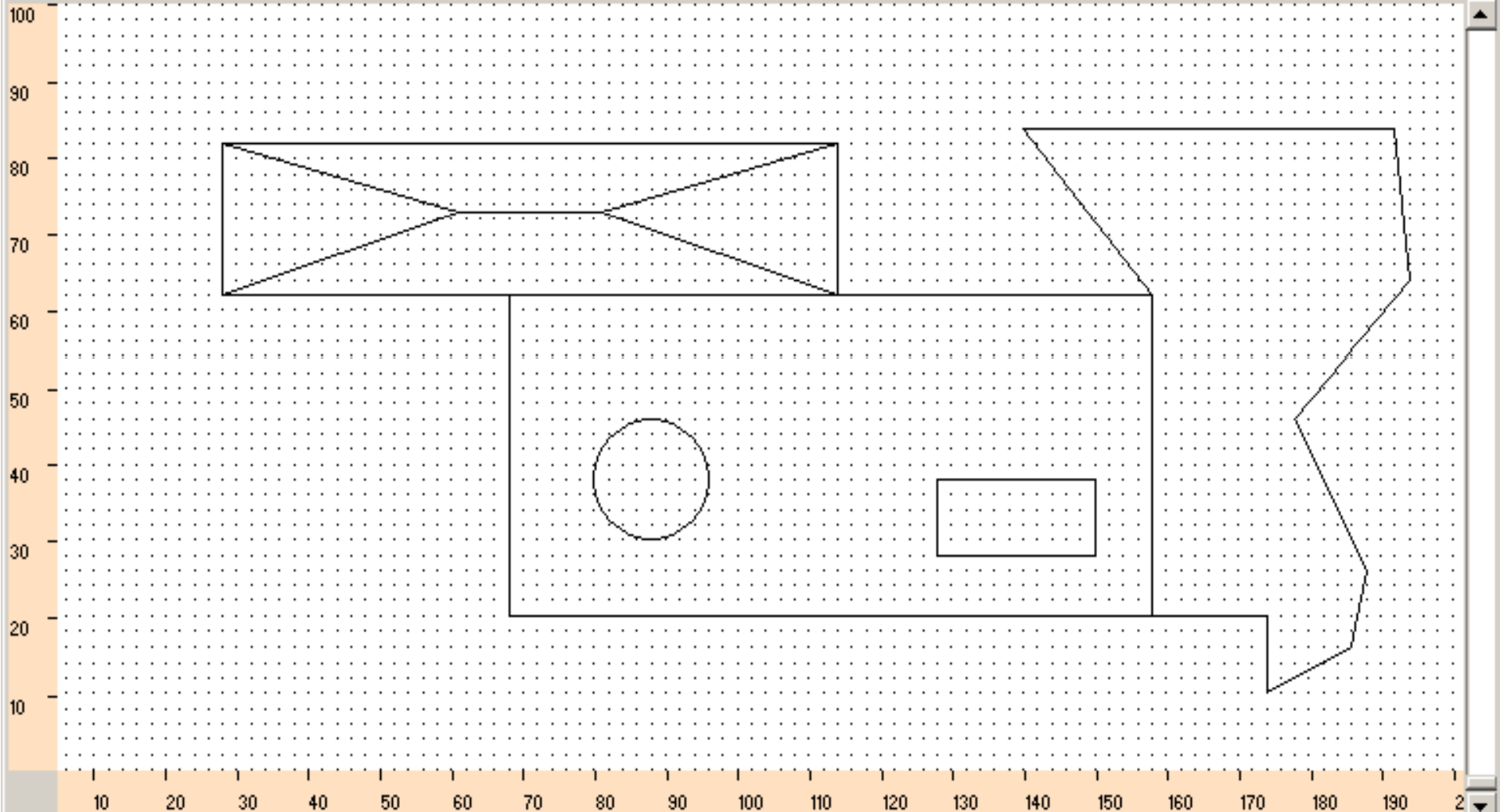
Roof



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 ridge 

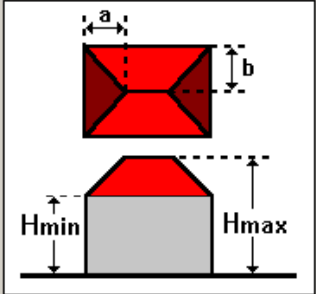
Input heights from soil for the selected block

Hmin (m)

Hmax (m)

a (0 - 44 m)

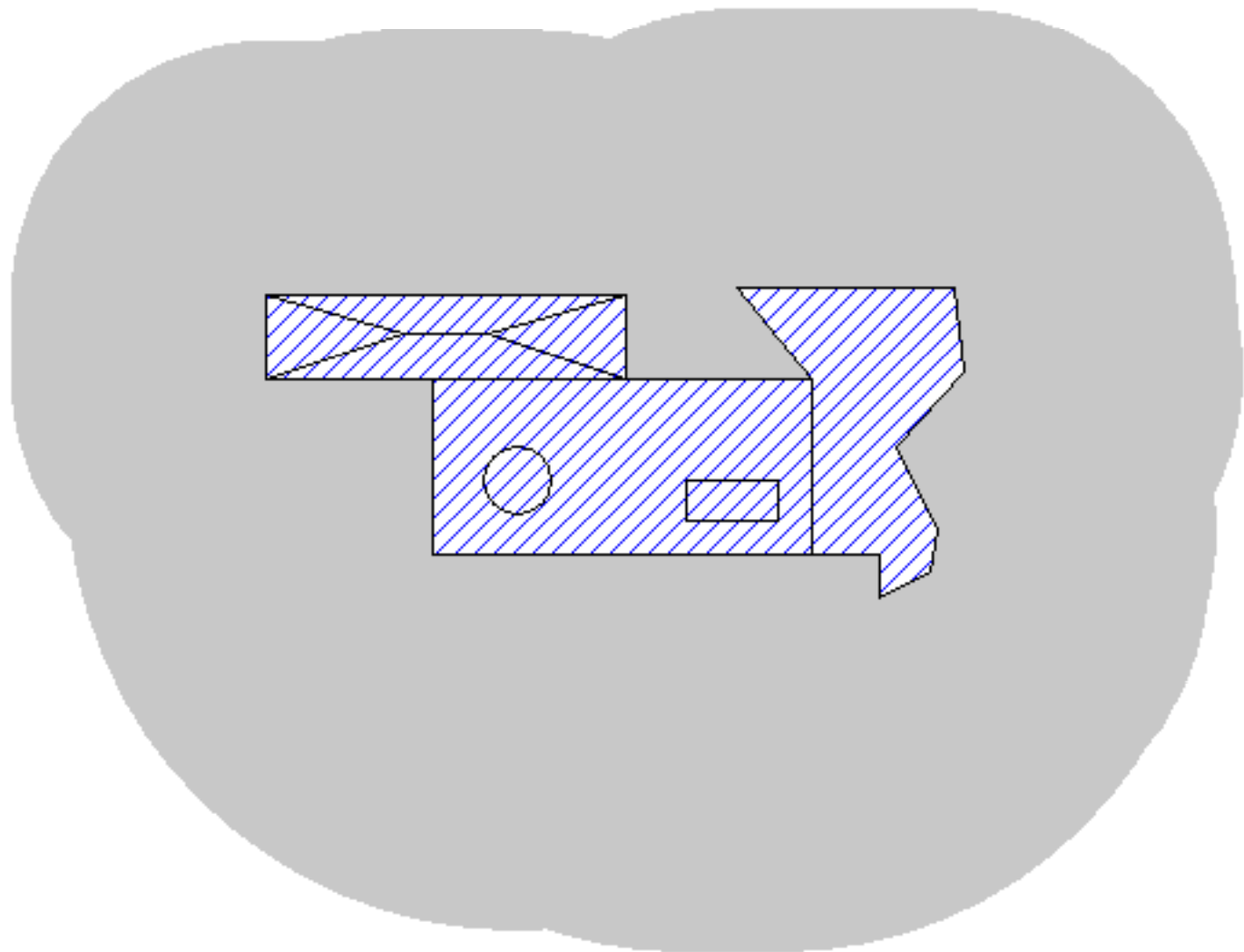
b (%)



X: 119 m

Y: 96 m

# Calcul et tracé des surfaces Ad et Am



Collection Area Ad (km<sup>2</sup>):

5,51E-02

Collection area Am (km<sup>2</sup>):

3,14E-01

Show Ad

Show Am

Export image

Exit



# JUPITER



- Ecran "Lignes" :
  - Possibilité d'utiliser les lignes standard (aérienne, souterraine, HTA, BT ou data), comme précédemment
  - Ou description des lignes réelles (aéro-souterraine, avec transformateur en ligne ...)

# Lignes standard

File ?

**Line name**

Power aerial



Standard line



Custom line

Select line type

power - aerial

**Connected lines**

N.	Name
L1	Power aerial
L2	Power mixed
L3	Telecom



**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 eqp. 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

# Description des lignes réelles

File ?

**Line name**

Power mixed



Standard line

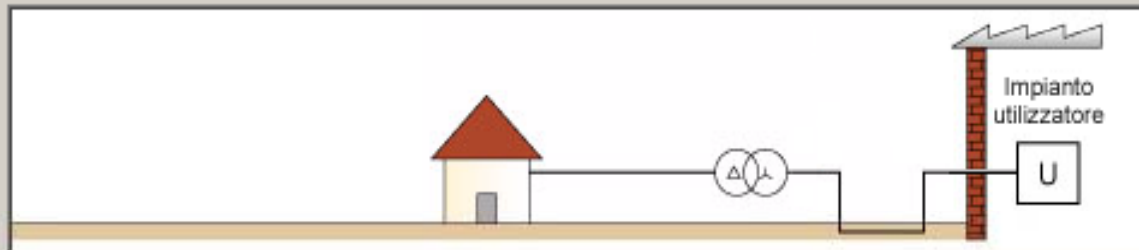


Custom line

**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

Risk of fire   Risk of fire evaluation

Fire protections  none  manual  automatic

Zone shielding  none  mesh  continuous

Ground surface type

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

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

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

Risk of fire   Risk of fire evaluation

Fire protections  none  manual  automatic

Zone shielding  none  mesh  continuous

Ground surface type

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

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

### Type of structure (MJ/m<sup>2</sup>)

- 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/m<sup>3</sup>)

### Volume material (MJ/m<sup>3</sup>)

- 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 m<sup>2</sup> 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 (m <sup>2</sup> )	Volume (m <sup>3</sup> )	Mass (kg)	Number of pieces
acetate polyvinyl	21 (MJ/kg)			870	
acetaldehyde	25 (MJ/kg)			500	
library (a m <sup>2</sup> surface, content included)	837 (MJ/pz)				500
natural rough rubber	28500 (MJ/m <sup>3</sup> )		2000		
machineries and toolmakers exhibition	90 (MJ/m <sup>2</sup> )	3000			

57719270 MJ

3136916,8 kg

Specific load fire (MJ/m<sup>2</sup>)

7214,91

Specific load fire (kg/m<sup>2</sup>)

392,11

Risk of fire

**High**

OK

Cancel

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**

Manual

Loss values input procedure:

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

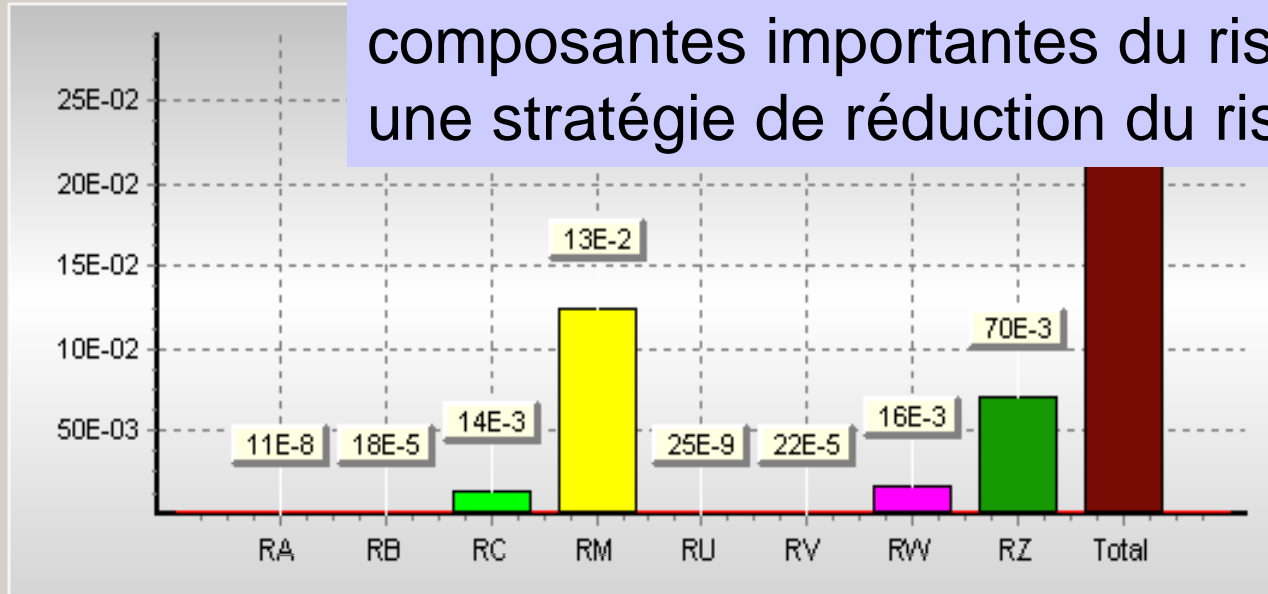
OK

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

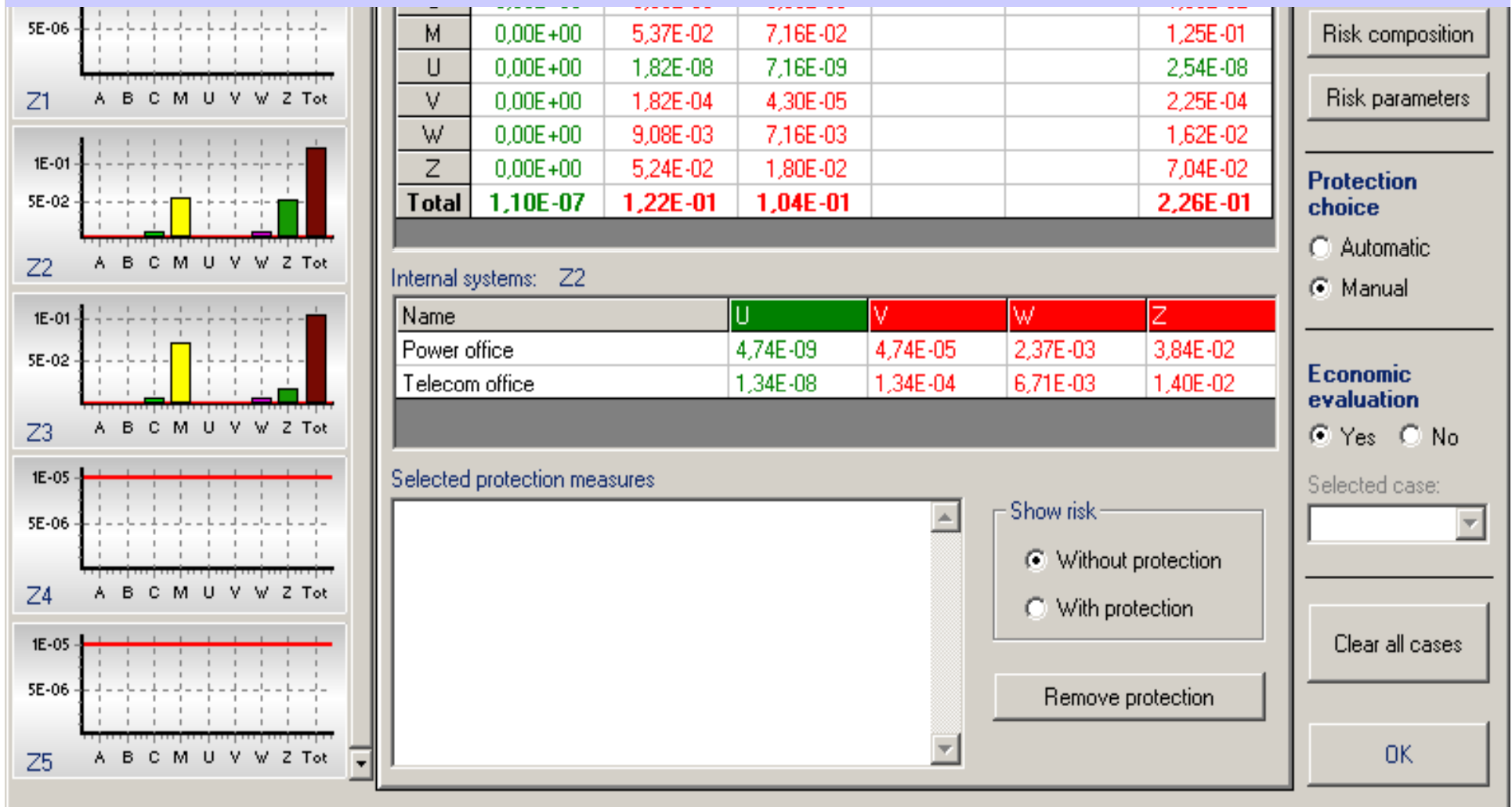
Zones

Calculations

Prot. measures

- Lightning flashes frequency  
Ng (flashes/year km<sup>2</sup>): 2
- Structure type: industrial
- Location factor: surrounded by smaller objects
- Shielding: No shield
- Collection area  
Dimensions: refer to annex  
Collection area Ad (km<sup>2</sup>): 5,51E-02  
Collection area Am (km<sup>2</sup>): 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

The screenshot displays the JUPITER - Protection m software interface. On the left, there are several bar charts labeled Total, Z1, Z2, Z3, Z4, and Z5, each showing values for categories A, B, C, M, U, V, W, Z, and Tot. The main area features a data table with columns Z1, Z2, Z3, Z4, Z5, and Structure, and rows A, B, C, M, U, V, W, Z, and Total. A dialog box titled 'Case 1 - Protection measures priority' is open, listing 10 protection measures with checkboxes for 'Enable'. The 'Automatic' radio button under 'Protection choice' is selected and circled in red. Below the dialog, there are sections for 'Internal systems', 'Selected protection meas', and 'Show risk' options.

	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	6,00E-03	6,00E-03			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
<b>Total</b>	<b>1,10E-07</b>					<b>2,26E-01</b>

**Case 1 - Protection measures priority**

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

	Enable	
1	LPS	<input checked="" type="checkbox"/>
2	SPD at line entrance	<input checked="" type="checkbox"/>
3	Manual fire protection	<input checked="" type="checkbox"/>
4	Automatic fire protection	<input checked="" type="checkbox"/>
5	Coordinated SPD	<input checked="" type="checkbox"/>
6	Wiring	<input checked="" type="checkbox"/>
7	Withstand voltage	<input checked="" type="checkbox"/>
8	Shielding	<input checked="" type="checkbox"/>
9	Touch and step voltage	<input checked="" type="checkbox"/>
10	Type of surface	<input checked="" type="checkbox"/>

**Protection choice**

Automatic  
 Manual

**Economic evaluation**

Yes  No

Selected case: [Dropdown]

Buttons: Risk 3, Risk 4, Risk composition, Risk parameters, Clear all cases, OK

**Internal systems:**

Name: [Text Box]

**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

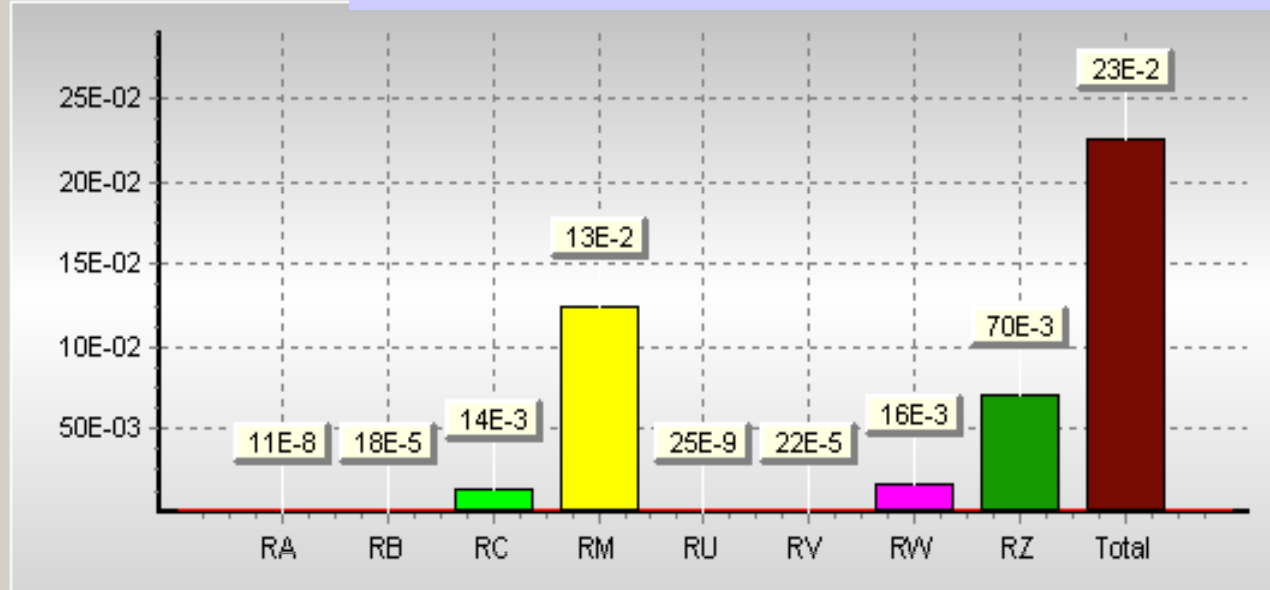
**Show risk:**

Without protection  
 With protection

Remove protection

# 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 km<sup>2</sup>): 2
- Structure type: industrial
- Location factor: surrounded by smaller objects
- Shielding: No shield
- Collection area  
Dimensions: refer to annex  
Collection area Ad (km<sup>2</sup>): 5,51E-02  
Collection area Am (km<sup>2</sup>): 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

Input structure and protection

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
<b>Total</b>	0,00	0,00	0,00	0,00

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

**Total saving (€)**

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

[Help](#)

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

Structure and contents value

Protection measures cost

Case 1

Zone
Z1 - External
Z2 - Office
Z3 - Production
<b>Total</b>

**Price list**

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

Description	Unit of measure	Cost (€)
<b>LPS</b>		
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
<b>MEASURES TO REDUCE THE CONSEQUENCE OF FIRE</b>		
fire extinguishers system	m <sup>2</sup>	0,35
fire hydrants system	m <sup>2</sup>	0,3
manual alarm installation	m <sup>2</sup>	0,5
manually operated extinguishing installation	m <sup>2</sup>	1,15

OK Cancel

Case 5

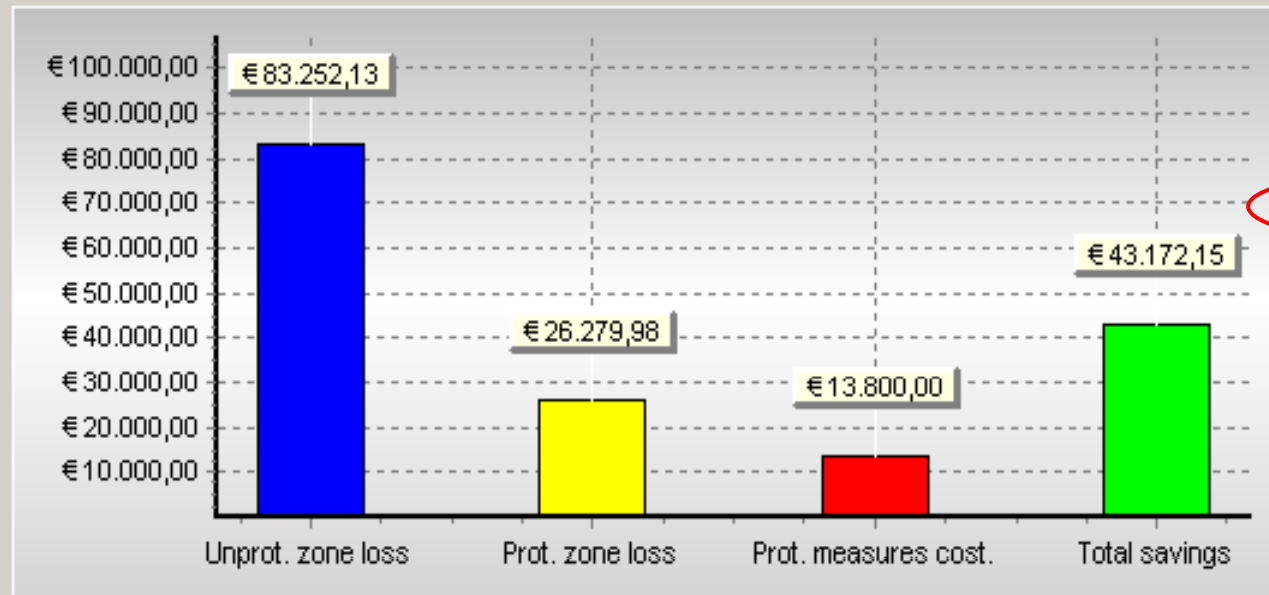
one saving (€)	0,00
	0,00
	0,00
	0,00
	0,00
	0,00

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

## 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

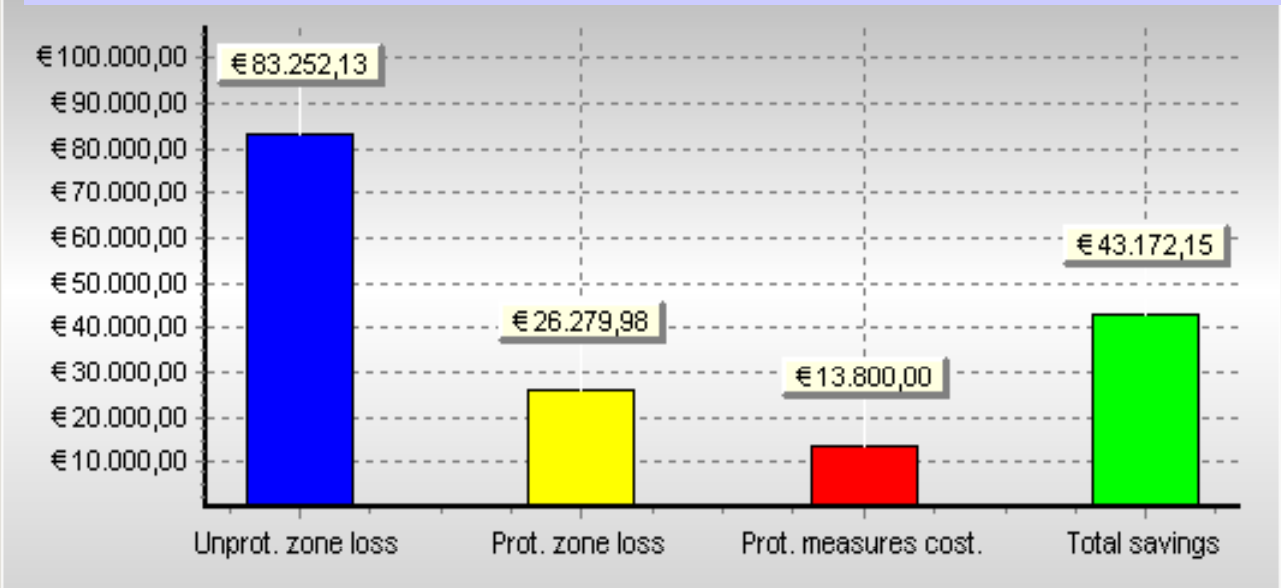
Zones

Calculations

Prot. measures

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



# Première étape : définition de l'installation électrique

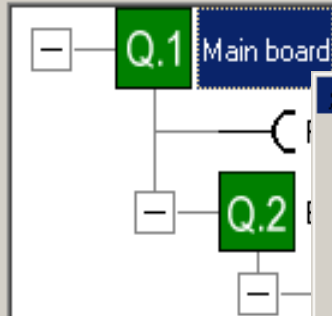
Electrical system : Power system : Line to neutral voltage (V) : Power is supplied by a transformer HV/LV with earth electrode in common with the building ?  Yes  No Safety coefficient for equipment : Is the line that supplies the installation shielded ?  Yes  NoSection (mm<sup>2</sup>) : Material : The connected line is :  a cable insulated from the soil or in air  
 a cable with the screen in contact with the soilDistance between the structure and the closest earthing point of the screen (m) :  Input minimum impulse withstand voltage of installed equipments (V) : Conductor section (mm<sup>2</sup>) : 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 <sup>2</sup>	2,5	III	1,0

OK

# Deuxième étape : définition du TGBT et des tableaux divisionnaires



**Board (3° level)**

Name of board (3° level):

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

Entering line characteristics:

Type of line:   Loop area in the order of 50 m<sup>2</sup>  
 Loop area in the order of 10 m<sup>2</sup>  
 Loop area in the order of 0,5 m<sup>2</sup>  
 Shielded cable R ≤ 1 ohm/km  
 Shielded cable 1 < R ≤ 5 ohm/km  
 Shielded cable 5 < R ≤ 20 ohm/km

All routing inside a shielded zone  
 Ks2 =

Metal continuous conduit

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

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

Number of different withstand voltage

	Withstand voltage (V)	Type of line.	L max (m)	Wiring
Circuit 1 :	<input type="text" value="2500"/>	<input type="text" value="F - N"/>	<input type="text" value="12"/>	<input type="button" value="Data"/>
Circuit 2 :	<input type="text" value="4000"/>	<input type="text" value="3F + N"/>	<input type="text" value="27"/>	<input type="button" value="Data"/>

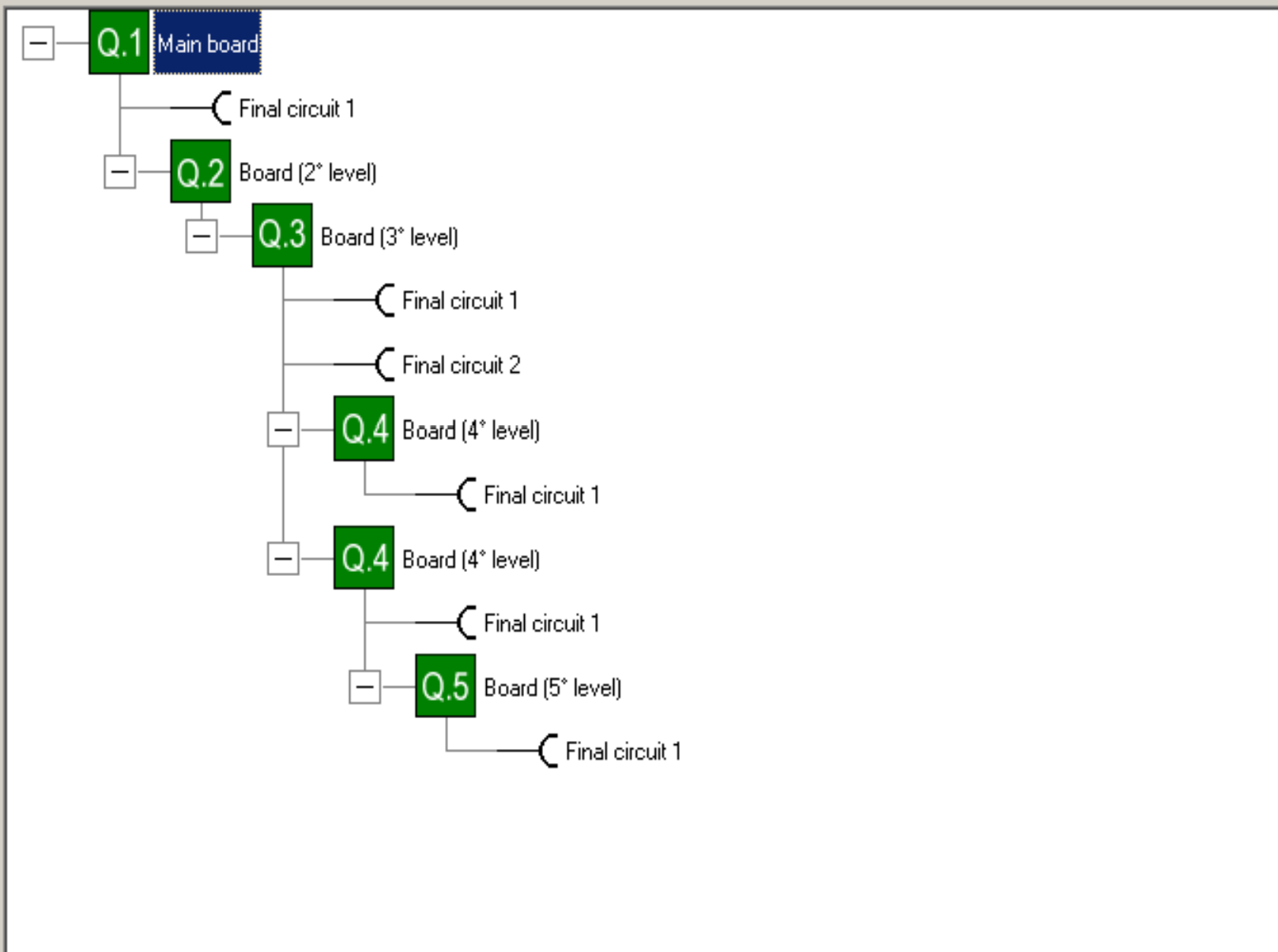
Board or circuit properties

Delete

Clear all

Data not complete  
 Data complete

# Dessin automatique du schéma unifilaire à partir des données entrées



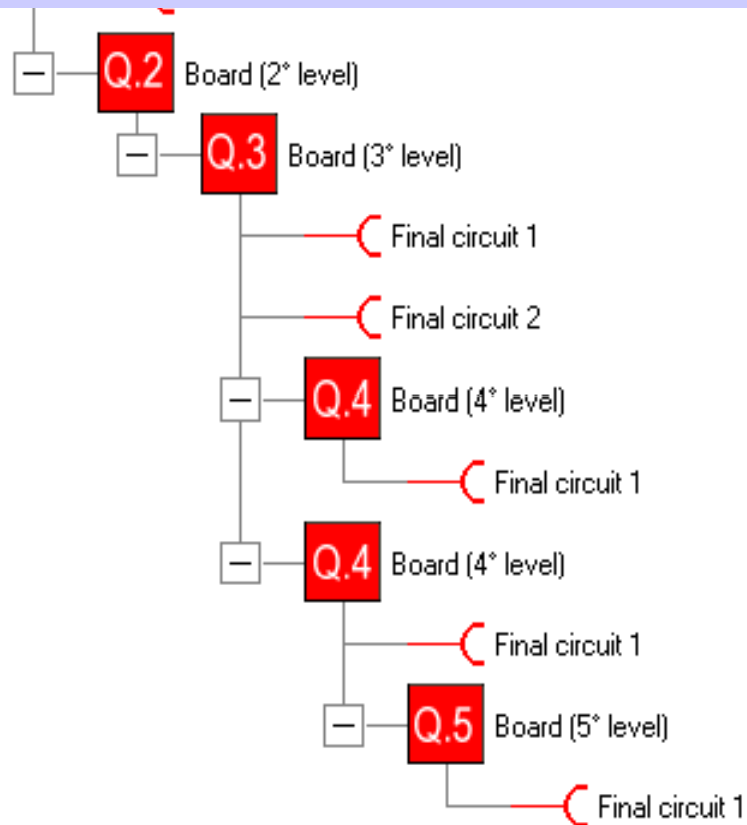
Board or circuit properties

Delete

Clear all

■ Data not complete  
■ Data complete

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



Remove SPD

Safety coefficient verification

Circuit protection verification

Remove all SPD

NOT protected

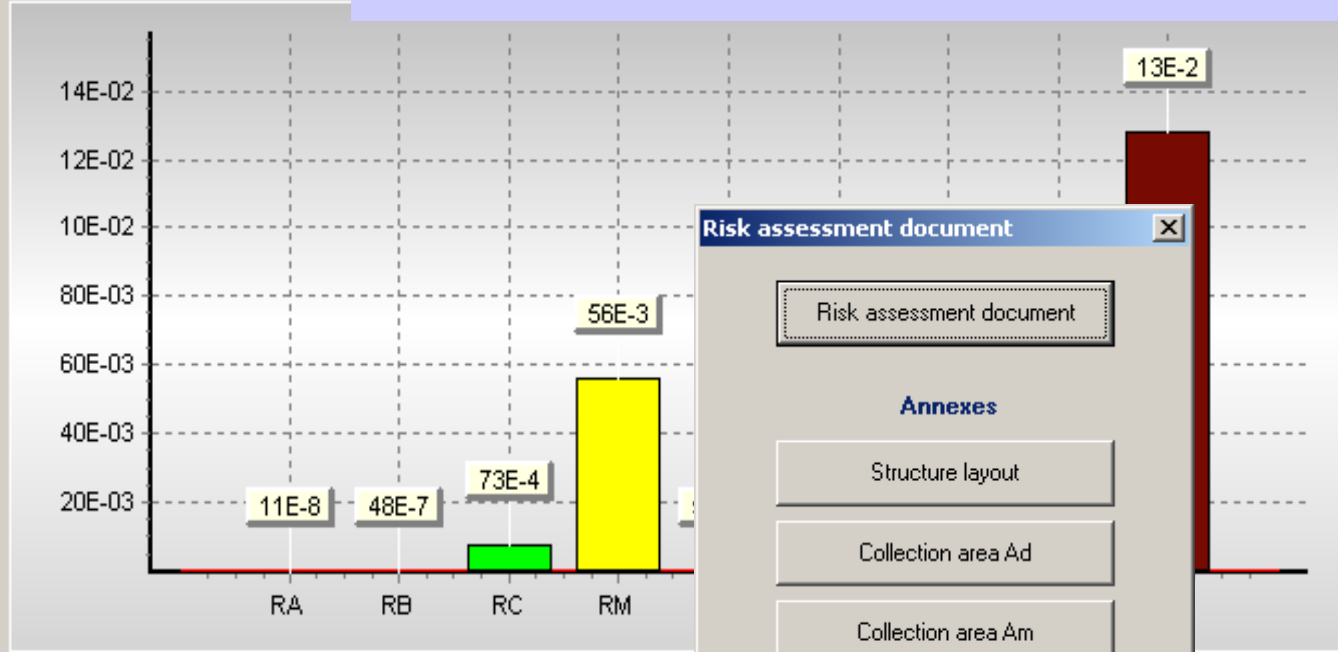
Protected

SPD installed

Legend

# Etablissement d'un rapport en mode texte complet et illustré

## Structure risk



- 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

### Risk assessment document

Risk assessment document

**Annexes**

- Structure layout
- Collection area Ad
- Collection area Am
- SPD installation

Exit

## 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

# Etablissement d'un rapport en mode texte complet et illustré

**JUPITER - P001 - METALPHA**

Projects list: Risk report

Structure risk

14E-02  
12E-02  
10E-02  
80E-03  
60E-03  
40E-03  
20E-03

13E-2

Risk 1  
Risk 2

**JUPITER - P001 - METALPHA Sa - industrial design**

**TECHNICAL REPORT**

**Protection against lightning**

**Risk assessment  
selection of protection measures**

Save Print Close

Selected protection  
Common protection  
LPS

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

protection measures  
s needed

ction area ✓  
nes ✓  
s selection ✓  
uation ✓

SPD selection ✓

Projects list