

# TECHNICAL LETTER N°1

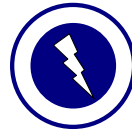


## IONIFLASH MACH NG®: FIVE SOLUTIONS to protect all your projects!

### 5 reasons to choose IONIFLASH MACH NG®?

- To rely on a safe and performing product recognised THE REFERENCE on E.S.E. Lightning protection systems.
- Because it is the only E.S.E. having satisfied to all the last National and International Standards such as EN/NFC 17-102, IEC/EN 50164 & IEC 60060, certified by Bureau VERITAS.
- To ensure to your clients a duration of quality, proved by experience return in nature since 40 years.
- To rely on an high level organisation with services and deliveries within 48 hours, with our ISO 9001/2008 quality organisation.
- To contribute with us to the GIEC's recommandation in the reduction of Carbon print, through the only product world-wide, carrying eco-conception.

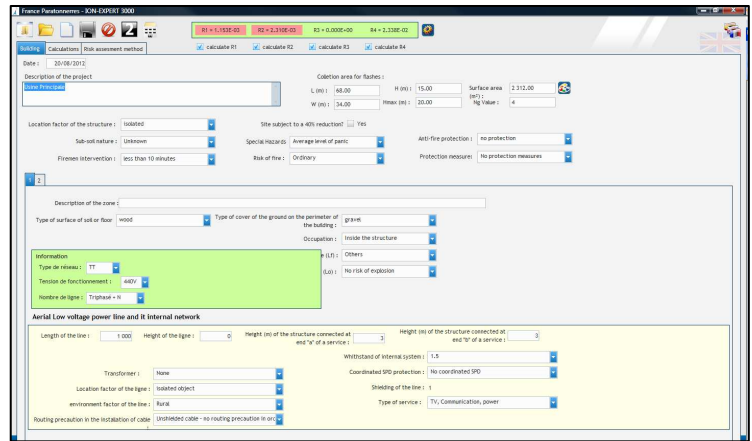
.....BECAUSE OUR RELIABILITY IS YOUR BEST INSURANCE .....



## IONEXPERT 3000® software At your disposal

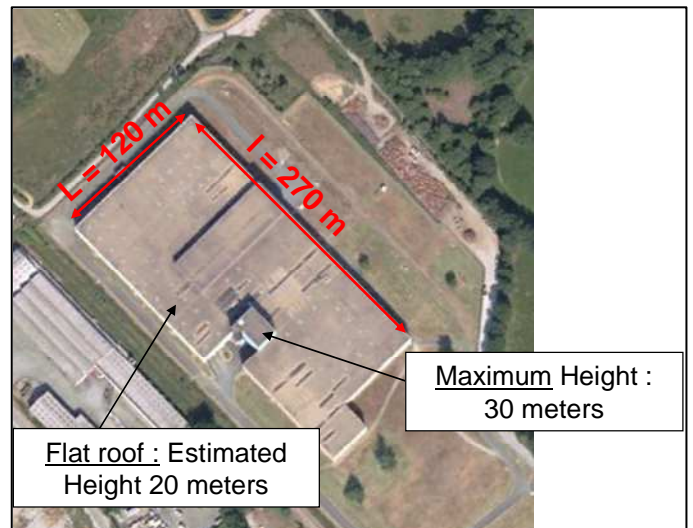
The last edition of the standard NFC 17-102 (2011) gives complete Analysis Risk Assessment Methods. This analysis is a mathematic modelling of the structure with its position, situation, dimensions and environments.

The **IONEXPERT 3000®** software developed by France Paratonnerres enables you to carry out the lightning risk analysis and the installation of protection devices.



### Case Study: Industrial Site in France:

Below, a view of the flat roof of this project which could be protected against lightning with dimensions of this structure.



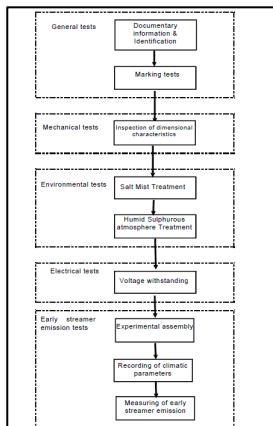
Note that the maximum **height** of this structure is around 30 meters (flat roof).



## Advice of France PARATONNERRES

We advise you for all your projects that you need to submit the certificates of **IONIFLASH MACH NG®** which have been passed with success all the tests according to the last edition of the standard NFC 17-102 of September 2011 such as:

- General tests
- Mechanical tests
- Environmental tests
- Electrical tests
- Efficiency tests



# FRANCE PARATONNERRES TECHNICAL LETTER N°1

We consider that the keraunic level of this industrial site is 2.8.

For this project, study gives a Human loss risk  $R_1$  of  $1.209 \cdot 10^{-4}$  greater than the tolerable  $R_T$  ( $1 \cdot 10^{-5}$ ).

By applying a lightning protection **level II**, the  $R_1$  risk ( $R_1 = 6.051 \cdot 10^{-6}$ ) is under the tolerable risk ( $R_T = 1 \cdot 10^{-5}$ ).

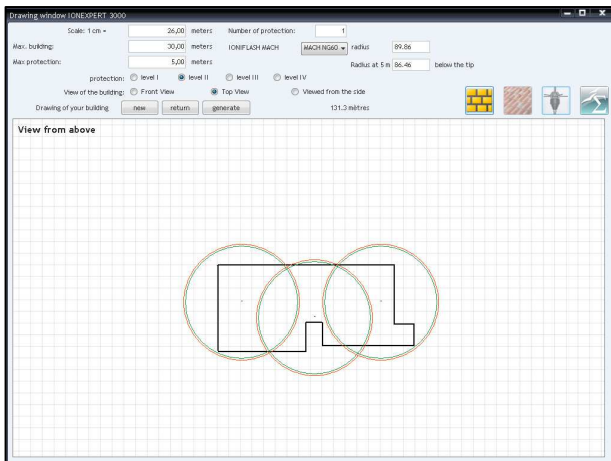
For this structure, the **level II** enables to reduce the  $R_1$  risk below the tolerable risk  $R_T$ .

Below, the result of the risk assessment provided by the IONEXPERT 3000® software.



According to the requested **protection level II**, it appears that 3 Early Streamer Emission air-terminal **IONIFLASH MACH NG 60** with an advance time of **60µs** are necessary to protect the structure.

For a protection level II and according to the standard NFC 17-102, an ESE Air terminal with an advance time of 60 µs has a radius protection of **86 m**. To obtain 86m radius protection, the IONIFLASH MACH NG 60 shall be installed at least **5 meters** over the area to protect.



After calculating the level of protection, it is necessary to determine the distance of separation.

In order to avoid any dangerous sparks and parasit effects, it is requested to install a lightning protection with a perfect equipotentialization between all the metallic and/or conductive parts.

The separation distance calculation enables to know the minimum distance with a dangerous spark risk.

$$s = k_i \times \frac{k_c}{k_m} \times l$$

- The coefficient  $k_c$  is equal to 0.75 for a crow's foot earthing system.
- The coefficient  $k_m$  is equal to 1 in the air and 0,5 in concrete or brick.
- The coefficient  $k_i$  is equal to 0,08 for the level of protection II.
- The maximum length  $l$  is about 30m.

FRANCE PARATONNERRES has developed an application for you in order to calculate the separation distance automatically\*. For this case, the maximum of the separation distance is 1.35 meters for a length of 30m (in the air).

\*This application is available on request to FRANCE PARATONNERRES

Moreover, standards require the installation of Class I SPD at the principal electric entry of the structure protected. So it is requested to install:

- 4 poles Class I SPD with protection at the principal electric entry. The Class I SPD will have to respect an impulse current of at least 12.5kA and a level of protection  $U_p$  lower than 2,5kV.

- Class II SPD for all the secondary electric entry.



## Advice of France PARATONNERRES

To enable monitoring and maintenance of the installation of lightning protection, it is necessary to install for each E.S.E an impulse lightning counter. So, we recommend you the impulse lightning counter **IONICOUNT®** developed by France PARATONNERRES. Robust, simple to implement, this counter should be placed on the down-conductor the most directly to the earthing system.

