

November 1, 2010

YAB, YB, YBhg,
His Excellencies
Sir/Madam

Response to the letter by the President of ILPA

We refer to the letter and memorandum by Mr. Arnaud Lefort, President of International Lightning Protection Association (ILPA) and Indelec SA (France) Lightning Protection dated September 24, 2010 which was posted on the ILPA website (<http://www.intlpa.org/ilpa.html>) and blogspot (<http://intlpa.blogspot.com/>). The letter was addressed to “all the destinaries of Mr. Hartono’s e-mails” dated June 23 and August 22, 2010.

The letter by Mr. Lefort was actually in response to our recent article on the early streamer emission (ESE) air terminal (i.e. lightning rod) technology, “**The Bell Tower Incident at Sigolsheim**” which was posted on the Lightning Protection Yahoo Groups on September 7, 2010. Our article highlighted the fact that an ancient stone cross installed on the roof of a 12th century bell tower was a better “lightning rod” than a 20th century ESE air terminal which was installed just a few metres away. For more details, please refer to our paper below.

<http://tinyurl.com/belltowerincident> [Click this link to download]

Mr. Lefort claimed that Hartono have been involved for many years in an unsuccessful lobbying action to deprive Malaysia of an existing lightning protection method: ESE lightning protection. His claim is correct since Hartono’s action was motivated by his study of bypasses (i.e. lightning caused damages) to ESE protected buildings which has been increasing in number and severity since 1991 i.e. the year he first photographed such bypasses.

The ESE vendors have been opposing Hartono’s articles, which included pictures of the bypasses, ever since he first presented them in a lightning protection seminar in Kuala Lumpur in 1993. Since then, Hartono have written more than a dozen articles on the subject with each new article containing additional pictures of bypasses which gave more reasons as to why the use of the ESE air terminals constitute a danger to the buildings and occupants.

While Mr. Lefort highlighted the fact that Hartono’s lobbying action was unsuccessful in Malaysia, he failed to mention that Hartono’s articles succeeded in depriving the USA, Australia, Singapore and many EU countries of the dangerous ESE technology. The reason for this is because the lightning experts in those countries were also opposed to the ESE technology and that they had relied on Hartono’s articles and bypass pictures to complement their findings that the ESE technology is non-scientific and unproven since 1995.

http://www.lightningsafety.com/nlsi_lhm/charge_transfer_opp.html

Professors Martin Uman and Vladimir Rakov of the University of Florida, USA, which is world renown for lightning research, summarized the position of lightning experts and scientists on the ESE and other non-conventional lightning protection technology in their 2002 paper, “**A Critical Review of Non-conventional Approaches to Lightning Protection**”. Hartono’s articles were referenced in their paper as evidence of the failure of the ESE technology.
http://www.lightningsafety.com/nlsi_lhm/Uman_Rakov.pdf (See page 1817)

Mr. Lefort also failed to mention that there was domestic opposition to the ESE technology by some French lightning experts from INERIS, a respectable French scientific institute. In 2001, these experts conducted a detailed scientific study on the ESE technology and they came to the same conclusions as their counterparts in other countries. They had also referred to some of the Hartono’s articles to support their opposition to the ESE technology.
<http://www.ineris.fr/centredoc/PDA.pdf> (See page 30/46, in French)

Mr. Lefort also failed to mention that some of Hartono’s articles had been translated into other European languages for the benefit of the non-English speaking engineers to know about the failure of the ESE technology.
http://www.spinpol.com.pl/download/ESE_Uzupelnienie.pdf (In Polish)
http://www.spinpol.com.pl/download/ESE_Hartono.pdf (In Polish)
http://www.dehn.de/design07_frame/pdf/ds_es/acem07.pdf (In Spanish)

Hartono’s articles were also referred to by the International Conference on Lightning Protection (ICLP) when they issued a warning in 2005 that the use of the ESE technology is dangerous.
<http://www.iclp-centre.org/warning.html>

From the above, it can be seen that Hartono’s articles have enlightened lightning experts and enhanced lightning safety around the world, hence they were neither misleading nor inspired by a deliberate will to harm as claimed by Mr. Lefort.

Hartono’s articles had indeed succeeded in partly or totally depriving many advanced countries around the world of the unproven and dangerous ESE technology. Had the ESE vendors not obtained the support of some academics from an influential Malaysian public university since 1995, Hartono would probably have succeeded in depriving Malaysia of the ESE technology too. This would have prevented many buildings from being severely damaged by lightning and would have prevented the country from wasting hundreds of millions of Ringgit on the invalid technology.

In many developing and third world countries where lightning expertise is deficient, the ESE vendors succeeded in recruiting some self-proclaimed “experts” from universities and other technical organizations to support their dubious marketing strategies. These “experts” were offered generous commissions, fees or research grants for directly or indirectly supporting the marketing and sale of the ESE technology.

The ESE vendors and their proponents have also threatened legal actions against individuals, scientific organizations and the media in order to gag any information that is considered detrimental to their commercial interests. The threat to take legal action against Hartono, as shown by Mr. Lefort's letter, is one of several made by ESE vendors and their proponents in the past ten years.

As shown by a recent court case in the USA, the legal action taken by ESE vendors failed because they were found to have used deceptive marketing techniques.
http://www.lightningsafety.com/nlsi_lhm/ESE_court_case.pdf

The government should realize that they have been deceived by the ESE vendors and local academics into supporting the sale and use of the dangerous ESE technology in Malaysia. This has not only led to losses in the hundreds of millions of Ringgit but also endangered hundreds of thousands of Malaysians of all walks of life in severely under-protected buildings. Tens of thousands of children are affected too since many schools around the country were also "protected" by the ESE technology.

These were documented in our reports that were opposed by ILPA, ESE vendors and their proponents in a local public university:
http://www.lightningsafetyalliance.com/documents/acem_air_terminals.pdf
http://www.lightningsafety.com/nlsi_lhm/ACEM_Journal_Q1_2007.pdf
http://www.lightningsafety.com/nlsi_lhm/early-streamer-emission.pdf
http://www.lightningsafetyalliance.com/documents/streamer_emission.pdf
<http://www.mikeholt.com/newsletters.php?action=display&letterID=823>

The actions of the ESE vendors and their proponents in deceptively promoting and selling the dangerous ESE air terminals to unsuspecting users tantamount to reckless endangerment as well as an "act of terror" using known dangerous and unproven technology. Hence we have coined the term "techno-terrorism" to define their despicable act which Mr. Lefort deftly considered as "extremist" and "defamatory".

Whether it is done by shadowy militant groups, by large commercial organizations or by public universities, the act of putting human lives and properties in danger by any means should be recognized as an "act of terror". Installing an ESE air terminal is like installing a time bomb since the destructive effect is delayed by weeks, months or even years i.e. only when the lightning strikes and damages the building.

The government must wake up to the deception committed by the ESE vendors and their proponents since future lightning incidents involving the use of the ESE technology may lead to injuries and fatalities (if not already). If defective motor vehicles, unsafe medicinal drugs and hazardous cosmetics have been recalled by the relevant ministries, then MOSTI should recall the ESE air terminals since their use have resulted in severe damages and fires that endangered human lives.

Defending the nation from unscrupulous business entities like the ESE vendors and their proponents is the responsibility of every knowledgeable citizen. Any engineer or scientist in our position would have done the same if they have solid evidence that

the ESE technology is dangerous and is being promoted by safety challenged businessmen and their proponents.

We have also attached our response to the Memorandum that accompanied Mr. Lefort's letter to reveal yet another of the ESE vendor's campaign to deceive the public.

Yours sincerely

The image shows two handwritten signatures in black ink. The signature on the left is 'Hartono' with a stylized flourish underneath. The signature on the right is 'Robiah' with a similar flourish underneath.

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Response to the ILPA document: “E.S.E. LIGHTNING PROTECTION MEMORANDUM”

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This paper was written in response to the above memorandum which was prepared by “expert members” of the International Lightning Protection Association (ILPA) and posted on their website (<http://www.intlpa.org/ilpa.html>) and blogspot (<http://intlpa.blogspot.com/>). The memorandum was made in response to our recent article on the early streamer emission (ESE) air terminal (i.e. lightning rod) technology, “**The Bell Tower Incident at Sigolsheim**”.

<http://tinyurl.com/belltowerincident> [Click this link to download.]

The article had highlighted the fact that an ancient stone cross installed on the roof of a 12th century bell tower was a better “lightning rod” than a 20th century ESE air terminal which was installed higher than the cross just a few metres away.

The following is our response to the claims made in the memorandum:

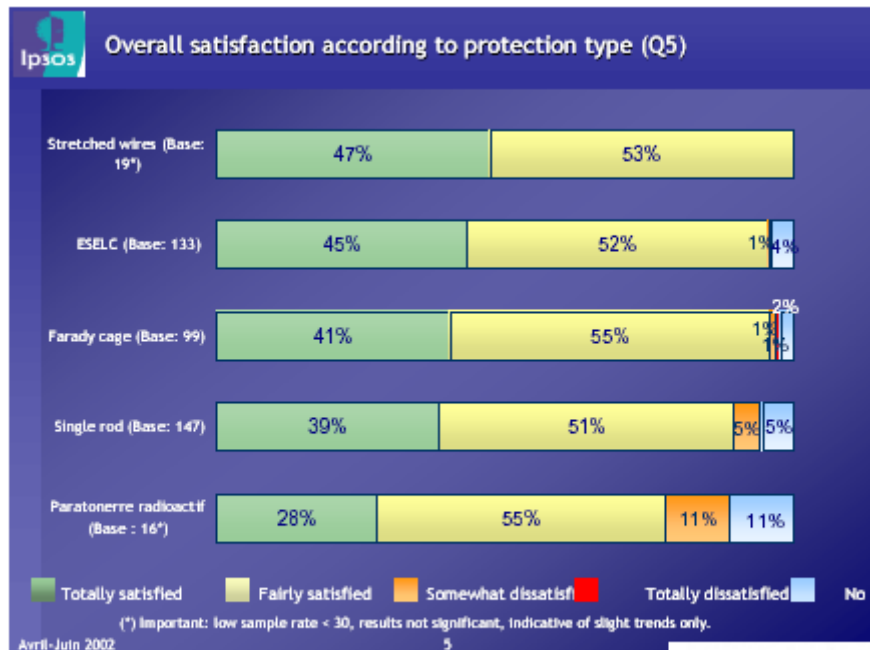
1) A WORLDWIDE RECOGNITION OF EFFECTIVENESS?

The memorandum provided a list of the types of buildings protected, the various user countries and the statistics of ESE air terminals installed worldwide (items 1.1 to 1.3). These did not in any way validate the effectiveness of the ESE technology since the basis of the technology, the streamer speed claimed by the ESE vendors, has never been proven since it was rejected more than 15 years ago (Appendix 1).

The memorandum also mentioned about the unique (telephone) survey on protection of industrial sites in France (item 1.4). The survey was based on “levels of satisfaction” among the people in charge of the industrial facilities; hence it was not a scientific validation of the ESE technology.

The memorandum also highlighted that the ESE systems obtained the highest satisfaction level with 97% of totally or fairly satisfied users and that the conventional (Faraday cage) system came as a close second at 96%. The very small difference between the two figures is hardly an endorsement that the ESE system is better than the conventional system.

Furthermore, a close inspection of the overall satisfaction graphs show that all of them add up to 100% except the ESE (102%) and radioactive rod (105%). If the ESE “expert members” were unable to do simple tasks like arithmetic additions, one wonders whether they could understand the scientific arguments by CIGRE that led to the rejection of the ESE technology 15 years ago (Appendix 1).



Overall satisfaction according to protection type

The claim that the ESE systems have a field experience as good as the lightning protection solutions according to (international lightning protection standard) EN62305 is unfounded since the two methods of air terminal placement are very different. The ESE system usually requires a single ESE air terminal to be placed at the centre of the roof while the EN62305 requires several conventional air terminals (i.e. Franklin rods) to be placed at the corners and pointed features of the roof.

Since studies have shown that lightning strikes predominantly to the periphery of the roof, according to the Rolling Sphere Method developed by Professor Horvath of Hungary more than 50 years ago, the air terminals placed according to the EN62305 have a much better chance of being struck by lightning than the centrally located ESE air terminal. That is the reason why all our pictures of ESE protected buildings displayed bypasses at the corners and pointed features.

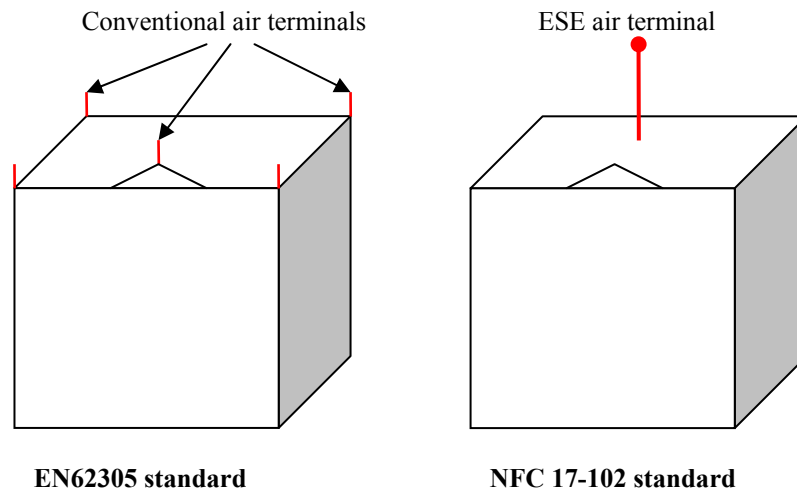
The memorandum also mentioned the European and international patents issued for ESE products since 1985 (item 1.5). The issuance of patents also does not validate the ESE technology since most patents are issued without the need for independent scientific validation.

2) SAFETY LEVEL

The comparison made by the ILPA “expert members” with regard to the EN62305 and the ESE standard NFC 17-102 is too simplistic to discuss in half a page.

Essentially, the air terminal placements method found in the EN62305 is different from that of the NFC 17-102. The diagram below illustrates this point.

Comparison of air terminal placement methods



Studies have shown that lightning usually strikes the edges and pointed features of structures irrespective of the air terminal technology installed. Pictures of bypasses taken by other photographers from around the world and posted on photo websites such as Flickr support this finding. Example:

<http://www.flickr.com/photos/krob/4640492365/>

Hence EN62305 standard recommends the placement of conventional air terminals at these highly vulnerable locations. When the air terminals are correctly placed and installed, no bypasses were observed after several years of observation.

On the other hand, the ESE vendors claim that their air terminal provide a greater protection zone, hence one ESE air terminal is usually installed at the center of the roof according to NFC 17-102 standard. In high lightning activity countries like Malaysia, bypasses were observed at the corners and pointed features of the ESE protected structures after a few years. In some cases, the bypasses were observed only a few months after the ESE air terminals were installed.

3) CONCLUSION

In the conclusion of the memorandum, the “expert members” of ILPA claimed that

- “Mr Hartono papers are deliberately partial and his criticism is lacking a scrupulous, objective and complete investigation.”
- “His conclusions are mainly based on photos of damages due to lightning in buildings where an ESE is installed.”

They further claimed that

- “Mr Hartono never made a complete investigation of the lightning protection installations, checking and documenting if the installation accomplished with the relevant standard requirements.”
- “He never explained that those damages were negligible, statistically irrelevant and inside of the current standard parameters for efficiency.”

The above claims were baseless and mere repetitions of similar claims made in other countries for the past few years. A few days after the memorandum was posted on the ILPA website and blogspot, we posted another article “The Minaret Incidents at Putrajaya”.

<http://tinyurl.com/minaretincident>

The Minaret article shows that Hartono has been meticulous in his investigation on the failure of the ESE technology since he conducted a 12 year long investigation on this particular building alone. There were other buildings whose study periods were much longer such as the Villa Putri and The Mall buildings.

The Minaret case provided indisputable evidence that lightning can strike deep within the claimed ESE protection zone and far below the ESE air terminal. The minaret is the ideal “ultimate test” case for the ESE air terminal and standard since the ESE vendors and proponents were unable to do anything at all with their technology to protect the structure from being struck by lightning.

Since the minaret incident has been published in a local technical journal a few years ago, the ESE vendors should have taken the initiative to mitigate any design and installation defects according to the ESE standard. The fact that the bypasses keep on occurring shows that the claim of enhanced protection zone is non-existent and that the NFC 17-102 standard is invalid.

http://www.lightningsafety.com/nlsi_lhm/ACEM_Journal_Q1_2007.pdf

The ILPA “expert members” also claimed that “(Hartono) never explained but hid away that similar damages occur in the conventional lightning protection system (to 62305 standards series) he is lobbying”. This claim is again ridiculous because Hartono’s numerous pictures of bypasses to conventional systems, which he submitted to Standards Australia and the IEC more than a decade ago, had resulted in the addition of a new air terminal placement method in the Australian and IEC standards in 2003 and 2006 respectively.

In fact, a letter dated 19th October 1999 from Mr. Lefort to Professor Darveniza of Australia had praised Hartono’s “excellent survey” on the conventional system failures. Since Mr. Lefort is also the President of Indelec and ILPA, the “expert members” claim about Hartono is bizarre and absolutely untrue. They were either ignorant of Hartono’s contribution to the international standards activities or else they were trying to mislead the public on his important contributions on air terminal placement in the Australian and IEC standards.

It is plainly obvious that the memorandum about Hartono suggest that the ILPA “expert members” have ran out of new ideas to prove that the ESE technology is viable. Since Hartono has provided more compelling evidence that the ESE technology is

invalid, it seems that they have no other options but to undermine his credentials by spreading nonsensical statements to the public.

The facts exposed above clearly show that the ILPA “expert members” have behaved childishly in their disinformation campaign about Hartono and that the ESE technology is neither efficient nor safe when compared to the conventional technology.

November 1, 2010

Comment on Annexes

The following are our comments on the annexes to the Memorandum:

ANNEX 1

No comments.

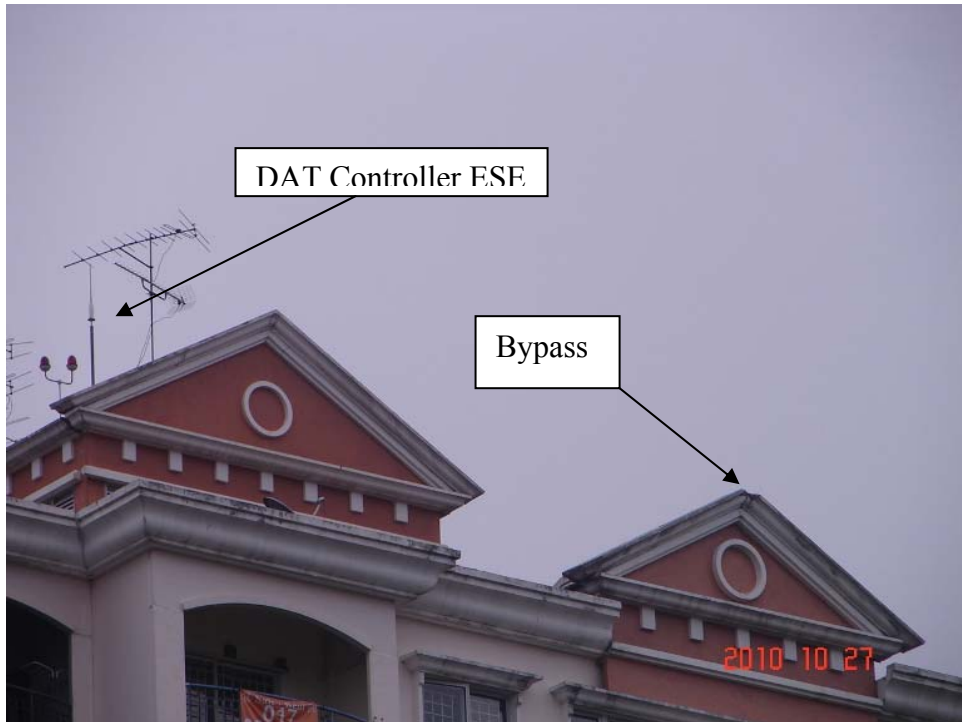
ANNEX 2

While buildings that were mentioned in other countries seemed to be prominent and well recognized buildings in the capital or major cities, the Malaysian buildings mentioned in this annex were located in out-of-the-way townships like Puchong, Tropicana, Gemas (military camp) and Kulim (BMW assembly plant). The ILPA “expert members” have avoided mentioning the prominent buildings in Kuala Lumpur and other big cities because many of them already displayed at least one bypass which can be easily seen from the road.

In the case of Puchong Town Center (i.e. Pusat Bandar) condominium, there is no condominium by that name but there were several condominiums and apartments in the vicinity of the town center. An inspection of some of these buildings revealed that many of them had been struck by lightning in spite of having installed the ESE air terminals. One example is shown below:



The Kenanga Apartment in Pusat Bandar Puchong.



Close-up picture of the Kenanga Apartment showing the DAT Controller ESE air terminal and the bypass on a nearby façade. If a conventional air terminal had been installed at the tip of the façade, then the damage would have been avoided.

In the case of the BMW assembly plant in Kulim, the assembly plant buildings have metallic roofs and facades, therefore this plant should not have been mentioned by the “expert members” since a lightning strike to the metal roofs will not display any noticeable bypass.



The BMW-Inokom assembly plant in Kulim.

ANNEX 3



The map above which shows the use of ESE technology worldwide is highly misleading. This has been mentioned in our December 2009 paper “**ESE: The Device for a Modern Answer to Lightning Protection?**”

http://www.mikeholt.com/download.php?file=PDF/Response_to_ESE_advertorial.pdf

(See pages 6 and 7)

The above paper states that:

“The above claim is perhaps the most misleading claim of all. This is because Japan, one of the countries mentioned, is well known for its very strict adherence to technical standards and had not installed the ESE on such a wide scale as claimed in the advertorial.

Our studies of Japanese lightning protection practices show that most Japanese high-rise buildings have been installed with one or more pole mounted air terminals that, from a far distance, looked like those seen in Malaysia. However, when observed using a binocular, these air terminals were actually pole-mounted Franklin rods instead of the ESE lightning conductors (see photos next page).

These studies were conducted in several major cities like Tokyo, Yokohama, Kyoto, Osaka and Kobe and had been partially published in a conference paper⁴. The studies show that the use of ESE air terminals in Japan is less than 1% and not as claimed in the advertorial.

We have also made similar studies of buildings in London and a few other cities in the UK and have found that the use of the ESE air terminals there is less than 50%. In addition, the feedback we received from lightning experts in some Latin American countries mentioned in the advertorial revealed that ESE air terminals made up less than 50% of the installed LPS in those countries.

Hence the advertorial have actually made a maliciously false and misleading statement in order to hoodwink the public and professionals into thinking that scientifically advanced countries like Japan and the UK will use the ESE air terminals on a large scale. By making such claims, the ESE vendors hoped to trigger a herd mentality among the less informed public and professionals in developing and third world countries in order to boost their sales.”

It seems that the “expert members” of ILPA is still relying on discredited information to mislead the public about their commercial activities.

APPENDIX 1

The basis of the early streamer emission (ESE) lightning protection technology is the claimed velocity (V) of the **streamer**, a faint electrical discharge emitted by objects on the ground in response to the approaching **down leader**, a precursor of the lightning return stroke (i.e. flash). The ESE vendors had claimed that V has an assumed constant value of $1 \times 10^6 \text{ms}^{-1}$ i.e. one million metres per second. This figure is usually found (in small print) in the ESE product marketing brochures and no scientific reason has been given for this value in the past 20+ years.

The scientific community rejected the claimed value of V since this figure is not supported by published papers on natural or laboratory observations of streamers. The initial value for V in published scientific literature is between $4 \times 10^4 \text{ms}^{-1}$ to $2 \times 10^5 \text{ms}^{-1}$ i.e. at least ten times lower than the figure used by the ESE vendors.

The value ΔT gives the time advantage of the “early” streamer. Its value of between 50 to 100 microseconds is accepted by both ESE vendors and the scientific community since it has been demonstrated in some laboratory experiments.

When applied in the formula $\Delta L = V \times \Delta T$, i.e. Distance (ΔL) = velocity (V) x time advantage (ΔT), the claimed protection radius of the ESE air terminal is between 50 to 100 metres. That is why most ESE vendors usually sell one ESE air terminal to “protect” one large building by installing it at the center of the roof (Fig. 1).

However, the scientific community rejected this claimed protection zone because it has no scientific basis since the value of V applied by the ESE vendors is just hearsay. According to them, the protection radius (if any) should be between 5 to 10 metres only which is insufficient to protect even a typical bungalow.

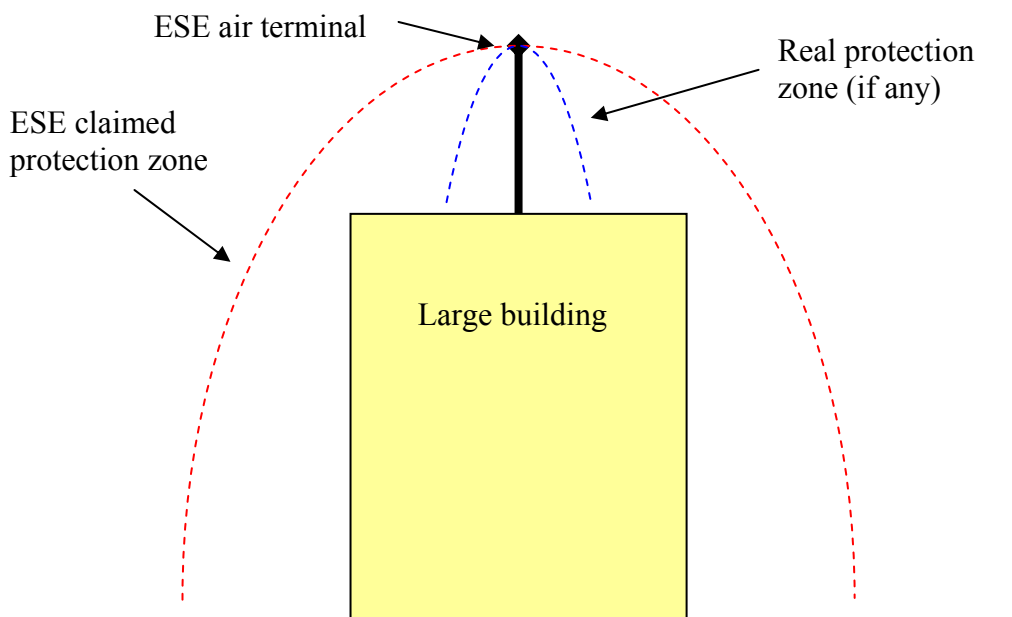


Fig. 1: Comparison between claimed (ESE) and real protection zones

Since 1995, technical and standards organization like CIGRE, IEC and NFPA have rejected the ESE technology for this reason. A copy of the 1995 CIGRE statement is shown below for reference. In 2002 the University of Florida, which is renowned for lightning research, again highlighted the ESE streamer velocity problem.

http://www.lightningsafety.com/nlsi_lhm/Uman_Rakov.pdf

ANNEXE B

STATEMENT OF CIGRE TASK FORCE 33.01.03 “LIGHTNING INTERCEPTION”

The components of the Task Force during the meeting held in Milano on May 18th 1995, have examined the problem related with the use of non conventional lightning air terminals (e.g. Early Streamer Emission).

From the discussion it arised that up to now there is neither sufficient theoretical analysis, nor substantial field data which support conclusive improvement in interception efficiency of these kinds of devices with respect to the conventional ones (metallic air terminals).

Main technical reasons

1 – Even if a streamer from a non conventional active terminal can be launched at an earlier time than a streamer from a conventional air terminal, once launched, it will require the same conditions of field strength to propagate as for a leader from a conventional air terminal.

2 - The assumed constant velocity of 10^6 m/s for upward leader propagation is in contrast with the field records which show an initial channel speed of about $0.04 \rightarrow 0.2 \cdot 10^6$ m/s and it increases as the gap between the upward and downward leaders diminishes.