



When nature strikes

Experts' share details on the deadly bolts and its frequency in Malaysia

story by
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MANY may not be aware that Malaysia ranks third in the world for lightning density.

The most recent case was in September when a 15-year-old boy from Kuala Terengganu died and three others were injured when lightning struck them while they were in a goat shed.

Based on a scholarly report for Optical Transient Detector Lightning by Dr Huge J. Christian in 2003, Malaysia has 48.3 flashes/km²/yr lightning.

The country with the highest lightning density in the world is Rwanda at a place called Kamembe which has 82.7 flashes/km²/ year.

This is followed by three locations in the Republic of Congo – Boende, Lusambo, Kananga – with 66.3, 52.1 and 50.3 flashes/km²/ year respectively.

One of the main reasons these countries are at the top of the list is because they are on the equator.

The Malaysian Meteorological Department (MetMalaysia) revealed that the inter-monsoon periods between April to May and October

Death caused by lightning in Malaysia

May 2006

> Hezrill Remmy Ng, 14, was struck by lightning and was killed while playing football in Jalan USJ 12, Subang Jaya. His three friends were injured.

Nov 2012

> Daniel Rodie, 34, a hearse driver was struck by lightning at a hut in Taman Century Cemetery in Luyang Kota Kinabalu.

Feb 2013

> R. Dinesh Kumar, a Form Five student was killed while his friend suffered serious burns when they were struck by lightning while playing football in their school field in Taiping.

March 2013

> Muhamad Zawawi Zolkefli, 13, was waiting at the bus stop opposite SMK Methodist Boys' in Jalan Air Itam, George Town, when he was struck by lightning and died instantly.

Sept 2013

> A man lost his life after the hut he took shelter in near SJKC Jernang, Kota Samarahan, Sarawak, was hit by lightning.

Oct 2014

> Palinappan Sinnayah, 42, was killed by lightning while jogging at Taman Tasik Titiwangsa in Kuala Lumpur.

Sept 2015

> Mohd Zamanqusyairi Ismail, 15, died while three others were injured when lightning struck the goat shed they were in. The deceased was from Kampung Pak Katak, Bukit Tunggal, Kuala Terengganu.

May 2015

> Two men waiting to pick up their children after school were killed by lightning while they took shelter in a hut during a thunderstorm at Batu Pahat, Johor.

April 2015

> At Nibong Tebal, N. Arumugam, 42, and V. Sivaperumal, 56, died on the spot while they took shelter at a temple when the lightning occurred.

has the most lightning occurrences.

Lightning is more frequent between June and September during the south-west monsoon.

There are fewer cases of lightning from December to March during the north-east monsoon.

Types of lightning and what to do

There are basically four types of lightning.

The most dangerous is the cloud-to-ground lightning.

It can kill humans, animals and damage property.

The second type is the inter-cloud lightning which is lightning from

one cloud to another and it does not hit anything on the ground.

Intra-cloud lightning is the third type of lightning where the lightning takes place within the same cloud.

Then there is the cloud-to-the-sky lightning where one sees the lightning flash from the clouds.

According to MetMalaysia, clouds are formed due to the heating of the air surface.

In urban areas such as the Klang Valley, which includes Petaling Jaya, Kuala Lumpur and Subang Jaya, there are more concrete buildings, hence the convection activities are stronger.



soundbites
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Safety not up to par

SOME 80% of the buildings in the country are using the non-conventional lightning protection systems (LPS) which is against international standards.

The non-conventional system does not provide the optimum building protection.

Lightning expert Hartono Zainal Abidin told *StarMetro* that the international practice is to use the MS IEC 62305 series.

However most buildings in the country were still using the Enhanced or Early Streamer Lightning Protection (ESE).

Universiti Putra Malaysia, Faculty of Engineering, Deputy Dean (Research & Innovation) Professor Mohd Zainal Abidin Ab Kadir agreed that all international standards were against the usage of the ESE.

"Yes, not only the Scandinavian countries but worldwide authorities are against this system," he said.

Prof Mohd Zainal said based on the recent studies that were conducted and published, almost 75-80% used non-conventional systems, which include the ESE.

However, since the release of the circular by the manufacturer of ESE on Sept 2011 and the release of the Guidebook

on Lightning Protection System For Building by the Energy Commission in 2014, many consultants and users were aware of the serious problem with ESE and other non-conventional systems.

Prof Mohd Zainal said the MS IEC 62305 series offers a proper LPS installation.

Asked who would be able to carry out the enforcement on LPS, he said in terms of policy, the Energy Commission was in charge.

"There is no Act particularly linked to this requirement.

However, they are working to come up with a law," he said.

Prof Mohd Zainal added the Urban Wellbeing, Housing and Local Government Ministry or the local governments should be able to enforce this guideline but it would still be difficult since they fall under the respective state governments.

He said at the moment, only Selangor made it compulsory to use MS 62305 series for LPS.

He added most of the vendors were reluctant to change or adhere to the recognised simply because of the profit margin.

The older LPS were also easier in terms of maintenance and installation.

Malaysia has the third highest lightning density in the world.—filepic

This causes lightning during a thunderstorm.

On the safety aspect, lightning expert Hartono Zainal Abidin said simple shelters such as huts in parks may not be installed with lightning arrestors.

However, a simple lightning protector system could protect those who seek shelter there.

He said in many cases, the copper light arrestors were stolen from the building rooftops because of its resale value.

"A simple lightning arrestor system for a gazebo would cost less than RM2,000 and it can help save lives.

"The cheaper way is to use the normal galvanised wire. It is less attractive than copper," he said.

However, these galvanised wires may erode within five years depending on the environment.

He also advised the public not to take shelter under trees when there was lightning.

Lightning strikes the highest point and in most cases it would be a tree in the field or park.

Hartono said staying in the car would be a better option in case lightning strikes.

Changes in climate pattern

MetMalaysia revealed that in January last year, peninsular Malaysia experienced exceptionally cooler weather than usual with Kuala Krai, Kelantan having extremely low temperature of 18.5°C, 19.0°C, and 17.2°C respectively on Jan 19, 21 and 22 as a result of low cloud coverage and colder wind from Siberia and Central China.

February 2014 also experienced cooler and drier weather than normal.

The lightning count in February 2014 was exceptionally low.

The water level at Sungai Selangor Dam and Klang Gate Dam, which supplies water to

Damage caused by lightning in Malaysia

- Sept 29, 1992**
> Lightning struck the electrical power grid near Paka, Terengganu causing a blackout in peninsular Malaysia. 80% of the population was left without electricity for 33 hours.
- April 28, 2006**
> Lightning struck a 90,000 liter petrol tank at the Petronas Dagangan depot at the Pasir Gudang port in Johor. The fire spread to two other tanks and the flames could be seen from Singapore.
- Nov 19, 2007**
> Two oil storage tanks at the Shell Malaysia refinery in Port Dickson caught fire after being struck by lightning.
- April 11, 2010**
> Lightning was believed to have caused a fire on the roof at the Orthopaedic Ward 3C of Putrajaya Hospital. Some 14 patients were evacuated.
- May 20, 2014**
> Malaysia Airlines flight MH1348 was struck by lightning during its flight from Kuala Lumpur to Langkawi. The flight landed safely at the Langkawi International Airport.

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Kuala Lumpur and Putrajaya, dropped below the 50% level.

When the levels dipped further to 30% and 40%, the Selangor government implemented water rationing in March until end of April.

Some meteorological stations, such as at Langkawi and Butterworth, recorded more than 30 days without rainfall.

Singapore also experienced a record dry spell in February 2014 with it being the driest month there since 1869.

It recorded the most windy month in the last 30 years with average wind speed of 13.3km/hr and set a new record for the lowest average daily relative humidity of 74.5%.

The lower-than-normal air temperature, strong wind and dry atmosphere contributed to extremely low lightning count.

Lightning survivor

The Sportswoman of the Year award winner in 1965 and 1966, Datuk M. Rajamani, was struck by lightning while training for the Mexico Olympics at the Kuala Lumpur Police Depot at Gurney Road on March 21, 1968.

She was a track and field athlete. Rajamani shared with *StarMetro* her memories of the incident.

She said during one of her trainings, she saw her fellow athlete who was running in front of her being struck by lightning, and died on the spot.

Dos and don'ts during thunderstorm and lightning

Lightning expert Hartono Zainal Abidin has written and co-authored over 50 reports and conference papers on building lightning protection. He also took the lead role in a forensics analysis of lightning damages to electronic and IT systems. Here are some of his tips to safeguard against lightning strikes.

- > Seek shelter as soon as you see dark clouds, lightning or hear thunder. Lightning can strike up to 15 km away from the cloud even before the rain starts.
- > Never use an umbrella in a lightning storm.
- > Do not take shelter under a tree, a small shed, a rotunda or a roadside food stall. For small shelters, ensure that they have been installed with a proper lightning protection system before you take shelter there.
- > Do take shelter in a large building; inside a metal roofed vehicle such as a bus, van or car; or under a large structure such as a bridge.
- > If there is no proper shelter nearby, avoid high points such as a hill top or platform.
- > Stay inside the shelter for 30 minutes after the last thunder is heard.
- > If it rains, get your clothes wet because wet clothing help reduce serious injuries if lightning strikes.
- > Do not loiter outside a large building as there are chances of being struck by debris from lightning damage.
- > Do not touch any metal object, electrical equipment or cable. Do not use the telephone unless it is really urgent.
- > Stay away from the balcony, verandah, doorway, window, wall or pillar.
- > Get into a lightning-defensive position. Squat down with your feet together and close your ears with your hands. Do not lie down.

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At that moment, Rajamani did not know that lightning had also struck her.

She regained consciousness only after five days.

"I did not even know why I was hospitalised and no one told me. I thought it was because of a throat infection," she said.

However, she learnt about her lightning attack from a girl who showed her a newspaper article

about the incident.

"I still had no memory of the incident. I also had no memory of my boyfriend, who is now my husband.

"Somebody told me that when they asked if I remembered my boyfriend, my reply was that I thought I had seen him before," said Rajamani.

Now, the 72-year-old spends her time with religious activities.