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# Lightning Safety Protocol

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## 1. INTRODUCTION

Thoroughbred Racing South Australia Limited (TRSA) is the controlling body for thoroughbred horse racing in South Australia. The Authority regulates, represents, promotes and manages the State's thoroughbred racing industry.

For the guidance of Clubs and participants in the South Australian thoroughbred racing industry as well as the safety of participants and patrons, TRSA has adopted the TRSA Lightning Safety Protocol.

In statistical terms, lightning poses a greater threat to individuals than almost any other natural hazard in Australia, accounting for five to ten lives and approximately 50 serious injuries annually through the population working outdoors or engaging in outdoor recreational activities. Survivors of encounters with lightning will likely suffer from residual effects which may not be immediately apparent, but develop over time, resulting in chronic neurological symptoms such as sleep disorders, memory loss, nerve pain, or personality changes. These symptoms are the result of damage to the nervous system by the intense electrical charge of a lightning strike.

During a thunderstorm, each cloud to ground strike is potentially lethal. Although some victims are hit by the main strike, many are struck as the current moves in or along the ground, or jumps sideways from other objects. This characteristic of lightning creates potential for groups of people to be hit at the same time.

Accordingly, it is considered appropriate that all Race Clubs, their employees and licensed persons, understand the TRSA Lightning Safety Protocol so as to promote the safety of all employees, contractors, participants and patrons.

TRSA considers that the most practical strategy by which such an objective can be achieved is through the application of what is commonly referred to as the "30/30 rule", supported by other supplementary measures.

## 2. WHAT IS LIGHTNING

Lightning is the discharge produced when differences between ground and atmospheric electrical charge are large enough (several hundred million volts) to overcome the insulating effects of air.

Lightning strikes can occur within the cloud, between clouds or between clouds and the ground.

Lightning strikes result in large voltage gradients - around 300 kilovolts, but they are extremely fast, taking a few milliseconds at most. Most of the current will pass over the surface of the body, a phenomenon known as external flashover. By contrast, industrial electrocution delivers between 20 and 63 kilovolts, lasting around half a second (until a circuit breaker is tripped or the victim is thrown clear) and the majority of the current passes through the body, usually resulting in contact and deep tissue burns along the length of the current's path.

Thunder is the sound produced by the explosive action of air heated by the lightning strike to temperatures as high as 20,000 degrees Celsius.

## 3. RESPONSIBILITY TO IMPLEMENT PROTOCOL

### At a race meeting or official trials:

- it shall be the responsibility of the Steward in charge to monitor the prevailing weather for signs of approaching storms and implement the TRSA Lightning Safety Protocol.
- The Steward in charge may delegate another Steward to perform or assist in this function.

### At Trackwork:

- it shall be the responsibility of the Course Manager, Trackwork Supervisor or an Official appointed for the purpose of overseeing trackwork to monitor storm activity and implement the TRSA Lightning Protocol.

### On all other occasions:

- it shall be the responsibility of a Club to ensure all its officials and employees are informed of and understand the TRSA Lightning Safety Protocol.
- during trackwork, the Course Manager, Trackwork Supervisor or an Official appointed for the purpose of overseeing trackwork should ensure that the TRSA Lightning Safety Protocol is implemented.
- on non racedays (including during commercial events, functions etc), the Club Manager/Chief Executive shall make their best endeavors to ensure that contractors, sub contractors, hirers and/or event managers have been informed of the TRSA Lightning Safety Protocol.

#### **4. THE “30/30 RULE”**

The “30/30 rule” relates to the time lapse between observing the flash of lightning and hearing the clap of thunder.

The rule is used as a measure of the imminence of a storm and therefore as a factor in considering whether outdoor activities should be suspended.

The rule is based on the time taken for sound to travel. Depending on the prevailing temperature and humidity sound travels at approximately 340 metres per second.

Therefore, in assessing the proximity of a storm, every three (3) seconds of delay between the observation of a lightning flash and the hearing of the associated thunder equates to a distance of approximately one (1) kilometre.

Accordingly, a thirty (30) seconds flash to thunder delay equates to the lightning activity being approximately ten (10) kilometres away.

##### **In summary:**

- 30 seconds: Count the number of seconds between observing lightning and hearing thunder. If this time period is thirty seconds or less, the lightning is sufficiently close to represent a hazard.
- 30 minutes: After observing the final lightning flash or hearing the final thunder, remain under cover for thirty minutes to ensure the hazard has passed.

It is important to understand that blue sky and the absence of rain are not adequate reasons to ignore the “30/30 rule”. Many victims are struck before the storm actually arrives because they wait too long to seek shelter.

##### **Note:**

The “30/30 rule” is not an absolute rule. A storm may move very quickly, or not generate any lightning or thunder until it is very close, or topographical or wind conditions may prevent sound from traveling to your position. These conditions are especially common in mountain areas. It is important that staff observe weather conditions and be alert to the possibility of the above occurring.

## **5. APPLICATION/IMPLEMENTATION**

If through the application of the “30/30 rule” or from the observations of the responsible officer as described in the Protocol it is considered that lightning activity is occurring within ten (10) kilometers of a racecourse the following measures shall be taken:

### **a) Suspension of Activity**

If the flash to thunder delay is thirty (30) seconds or less,

- (i) all activity shall be suspended, and
- (ii) an announcement made requesting all persons in attendance to seek shelter indoors.

### **b) Resumption of Activity**

As trailing storm clouds may still carry a lingering charge, activity at the racecourse shall not resume until a period of thirty (30) minutes has elapsed after the last flash of lightning was observed.

## **6. PREPARATION/MONITORING**

- The Bureau of Meteorology provides free, constantly updated information on weather forecasts including thunderstorm activity and severe thunderstorm warnings.
- Radar traces of approaching storm cells are also available.
- All such information is located on the Bureau’s website, which may be found at the following internet address: <http://www.bom.gov.au>.
- Accordingly, the Stewards and Clubs should maintain a heightened level of awareness in respect of weather forecasts at all times, and seek additional information from the above source if thunderstorms are forecast.
- During a storm the Stewards and Clubs shall monitor the storm activity on the Bureau’s website and, where practical, initiate contact with a duty forecaster.

## **7. SAFE LOCATIONS TO SEEK COVER**

The following locations would normally be regarded as the most appropriate to seek shelter:

- the safest location is inside a large enclosed structure, preferably with electrical/ telephone wiring and plumbing (to provide a safe pathway to the ground for any current), but keeping away from doors, windows, metal fittings and devices connected to the electricity supply.
- an enclosed metal vehicle, (such as a car, van or bus) but not touching metal.

### **8. A - UNSAFE LOCATIONS**

The following locations should be avoided:

- buildings with exposed openings.
- small structures or sheds
- open field/racecourse
- in close proximity to the tallest localized structure (eg surveillance tower, tree, light pole, antenna etc).
- umbrellas
- hosing bays, water troughs, swimming pools, lakes or water generally.

### **B - UNSAFE PRACTICE**

- avoid the use of telephones, radios, fax machines, computers and other electrical equipment. If emergency calls are necessary, they should be made on a mobile unit and calls should be kept brief.
- before the storm arrives (where practical) disconnect external aerials and power loads to radios and other appliances.
- avoid the use of hoses.

## **9. COMMUNICATION**

### **At a race meeting or official trials:**

The Stewards shall ensure that an appropriate announcement is made informing patrons of storm activity in the proximity of the racecourse, advising whether a race meeting or the official trials will proceed or be suspended and, where activity is suspended, requesting patrons to seek cover indoors.

### **On all other occasions:**

Clubs shall make their best endeavors to ensure that all persons using the Club's facilities are aware of the existence of the TRSA Lightning Safety Protocol. This can be achieved through a number of means including:

- Strategic placement of notices in all work and public areas detailing procedures for suspension and resumption of activity plus designated shelter areas;
- Preparation and distribution of information sheets to all frequent venue users (eg club employees, trainers, jockeys, trackwork riders, etc).
- Liaison with contractors, sub contractors, hirers of the venue (or any part thereof) and the manager of any event conducted on Club property.

## 10. FIRST AID

If a person has been struck by lightning, immediately seek medical assistance and/or an ambulance, however first aid is required urgently.

Victims of lightning strikes are safe to handle - they do not “retain charge”. First aid personnel should ensure they do not become another casualty - if necessary, move the victim to a safer location. Effects of lightning strike include cardiac and respiratory arrest caused by disruption of the brains’ control centres. CPR or EAR should be given as required. It is important that even persons who show no symptoms immediately after the strike receive medical attention as some effects may not be immediately obvious. Expired Air Resuscitation (“EAR” - more commonly known as “mouth-to-mouth” resuscitation) can be applied if a person is not breathing but still has a pulse. In the absence of a pulse, cardiopulmonary resuscitation (“CPR”) should be used.

### **Note:**

Lightning burns tend to be concentrated at the entry and exit points. Metal objects, such as buckles or necklaces, may be superheated by the external flashover and cause severe localised burns.

## 11. DEFINITION

**“The responsible officer”**, depending on the circumstances, shall mean the Steward in charge (of a race meeting or official trials), the Course Manager, Trackwork Supervisor or an Official appointed for the purpose of overseeing trackwork (at trackwork) or the Club Manager/Chief Executive or the Course Manager (at all other times).

## 12. OTHER LIGHTNING PROTECTION MEASURES

Clubs may provide enhanced lightning protection through adoption of other measures including:

- ensuring that all freestanding structures (eg surveillance towers) satisfy relevant statutory standards. In this regard, Australian Standard AS/NZS 1768 (Int) 2003 sets out guidelines for the protection of persons and property from hazards arising from lightning. The recommendations detail protection both outdoors (where persons/property are at risk from the direct effects of a lightning strike) and indoors (where the risk is indirect as a result of lightning currents being conducted into the building).
- installation of an Electrical Storm Identification Device. Lightning Warning Systems are local warning instruments designed to provide early warning of an approaching storm front that contains lightning discharges. Such systems generally comprise a main console, antenna assembly, electrical siren plus associated components and deliver an audible warning/alert once lightning activity has been detected.

**Adopted TRSA Board - 25 May, 2012.**