



Department of Consumer
and Employment Protection
Government of Western Australia

Resources Safety 

Mines Safety

Significant Incident Report No. 148

Tropical Cyclone George

On 2 April 2007 a joint Safety Bulletin on cyclones was issued by Resources Safety and WorkSafe. Following the WorkSafe investigation of fatalities at a construction rail camp, further information has been made public in relation to Cyclone George.

Incident

Severe Tropical Cyclone (TC) George crossed the Western Australian coast near Port Hedland at about 10 pm on Thursday 8 March 2007, causing extensive damage to areas in the north of the State. It was the most destructive cyclone to affect Port Hedland since TC Joan in 1975.

The eye passed over a rail construction accommodation camp, situated about 90 kilometres from the coast, while the cyclone was at Category 3 intensity.

Forecasts issued by the Bureau of Meteorology two days prior to impact indicated the cyclone was likely to pass to the west. However, in the 24 hours prior to the cyclone's passage over the camp, the forecasts indicated that the site was at risk of a direct impact from a severe tropical cyclone (Category 3, 4 or 5).

Evacuation of the camp was not considered based on the belief that the cyclone would not pass through the camp. The camp was prepared for the expected weather and all workers returned to the camp to be housed in their normal accommodation.

The rail camp/village was a temporary camp of transportable units (dongas) built to accommodate a 280 strong construction workforce for the duration of the construction phase of the project.

The winds associated with TC George displaced some accommodation units, which impacted with adjacent units when they broke away from their tie-downs. Some units broke into pieces and those pieces caused further damage to other dongas. At the time there were about 230 workers at the camp. The cyclone resulted in two fatalities and 22 notified injuries at the camp.

Causes

- The cyclone was expected to impact the coast and adjacent inland areas as a Severe Tropical Cyclone (Category 3, 4 or 5).
- Forecasts evolved with time to indicate a risk at the camp.
- The cyclone passed through the camp.
- The camp was not evacuated.
- There were no cyclone shelters.
- Workers were directed to stay in their normal accommodation.

- Some dongas broke loose from their tie-downs.
- Extensive damage was caused by loose building material.

Recommendations

Cyclone preparedness

Irrespective of the distance from the coastline, cyclones do penetrate from the coastal areas into the inland regions of the State, as evidenced by the history of cyclones in the North-West of Western Australia on the Bureau of Meteorology website.

Employers under the *Mines Safety and Inspection Act 1994* are advised to err on the side of caution in relation to the design and construction of buildings and other structures, and in the development of emergency plans and procedures in cyclone prone regions. Given the limited predictability of cyclones in terms of track and intensity, forecasts must be continuously monitored until the threat has *completely* passed. Remember that cyclones can and do 'backtrack'.

Building standards

The Australian/New Zealand Standard AS/NZS 1170.2:2002 *Structural design actions – Wind actions* sets out the wind speeds to be used for design purposes. AS/NZ 1170.2:2002 divides Australia into wind regions (three regions for most of Australia and four regions along the Western Australian North West coastline) as follows:

- Region A4** from a distance greater than 150 km from a smoothed coastline;
- Region B** within the distance of 100 to 150 km from a smoothed coastline;
- Region C** within the distance of 50 to 100 km from a smoothed coastline;
- Region D** within the distance of 0 to 50 km from a smoothed coastline.

Employers should seek engineering advice on the construction standards applicable to each wind region to ensure each accommodation unit or donga, transportable building and cyclone shelter on mine sites and camps in cyclone sensitive regions is adequately designed and constructed in accordance with the *Design Guidelines for Australian Public Cyclone Shelters*, published by Queensland Public Works for Emergency Management Australia, and Australian/New Zealand Standard AS/NZS 1170.2:2002.

Companies are reminded to seek advice and the relevant approvals from local Shires prior to constructing buildings on their site.

Emergency plans and procedures

In accordance with Regulation 4.30 of the *Mines Safety and Inspection Regulations 1995*, employers must develop emergency plans and procedures. In the case of emergencies arising from cyclonic weather conditions, this should be done in conjunction with advice from the Fire and Emergency Services Authority of Western Australia (FESA) and other regional emergency planning groups where sites are located.

It is a requirement that all personnel are trained and inducted in these procedures, and practical tests of the plans and procedures are carried out at appropriate intervals.

Employers should consider the evacuation of staff and detailed procedures for making the site safe, including the removal or restraint of loose objects and structures in their emergency plan. In situations where an informed decision to remain on site is taken as part of the procedures, appropriate cyclone shelters should be utilised, emergency provisions and supplies of food and water should be considered, and backup communications and power should be planned in advance. Evacuation of non-essential personnel from the worksite or camp to a predetermined suitable location should occur in the Blue and Yellow Alert Cyclone Warning phase, before high winds are experienced. Consideration of suitable evacuation locations should involve consultation with the destination Shire authorities and emergency services to ensure that adequate secure accommodation and facilities are available for evacuees. Care

must be exercised to avoid over-stretching the facilities in the destination area or merely transferring the risk to another location.

When employees remain on site during a cyclone, they should be moved to designated, appropriately designed and constructed shelter well in advance of the arrival of the cyclone to avoid being injured during the transfer to shelters. The designated cyclone shelter should be equipped with essential items such as food, water, lighting and toilets.

Where employees are required to stay on site, adequate stocks of food and other essential items should be available during the period when the site may be cut off due to high winds or flooding.

During the Red Alert Cyclone Warning phase, when all power has to be isolated, or in the eventuality of damage or interruption to the power supply or telephone and other communication systems, an adequate means of reliable emergency backup communication should be available on site to make contact with external emergency services should assistance be required.

Each site should continuously monitor cyclone warnings issued on radio, television or via the internet connection to the Bureau of Meteorology or FESA websites. In the event of power interruptions on site, battery-powered radios should be available.

All employers in cyclone sensitive regions are requested to review their cyclone plans and procedures as a result of this significant incident report and the recommendations made above. Additional information covered in this significant incident report on preparing for cyclones can be found on the websites listed below.

Further information

- Bureau of Meteorology (www.bom.gov.au)
- Fire and Emergency Services Authority of Western Australia (www.fesa.wa.gov.au)
- *Building Code of Australia* (www.aib.org.au/buildingcodes/bca.htm)
- *Design Guidelines for Australian Public Cyclone Shelters* by Emergency Management Australia (www.ema.gov.au, search for 'cyclone shelters')
- Australian and New Zealand Standards (www.saiglobal.com) — AS/NZS 1170.2:2002

Further safety information can be obtained from the Resources Safety website at www.docep.wa.gov.au/resourcessafety



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