





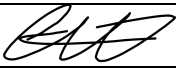
Cyclone Response and Management Plan

For The

Onslow Marine Supply Base (OMSB)

'Be Safe, Stay Safe'

Revision Approvals

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Prepared	Roger Fellows		24 March 2019
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Document History and Version Control

Revision	Date	Author - Role	Approved	Change Description
0	11/09/17	Christina Sobieralski		Document Created
1	01/01/18	Alan Chapman		Updated after drill
2	20/05/18	Roger Fellows		Updated
3	24/03/19	Alan Chapman		Updated

Contents

1.0	Context	3
2.0	Scope	3
3.0	Base Technical Profile	3
4.0	Purpose	4
5.0	Glossary of Terms	4
6.0	Explanatory Information – Cyclones	5
7.0	Accountability	7
7.1	Incident Controller (IC)	7
7.2	Yard Warden (YW)	7
7.3	Communications Officer (CO)	7
7.4	Site Personnel	7
8.0	Preparation	8
9.0	Cyclone Alerts and Considerations	9
9.1	Bureau of Meteorology	9
9.2	DFES Alerts	9
9.3	Agility Alerts	9
9.4	BoM Cyclone – Categorisation	10
9.5	Flood Considerations	10
9.6	Storm Surge	10
10.0	CMP Activation	11
10.1	Time Critical Decision	11
10.2	Individual Relocations	11
10.3	Prudent Over Reaction	11
11.0	Response Arrangements	11
12.0	Recovery Arrangements	13
	Appendix 1 – Cyclone Alert Stages	15
	Appendix 2 – Cyclone Preparation Checklist	16
	Appendix 3 – Cyclone Situation Report	18
	Appendix 4 – Cyclone Personnel Log	19

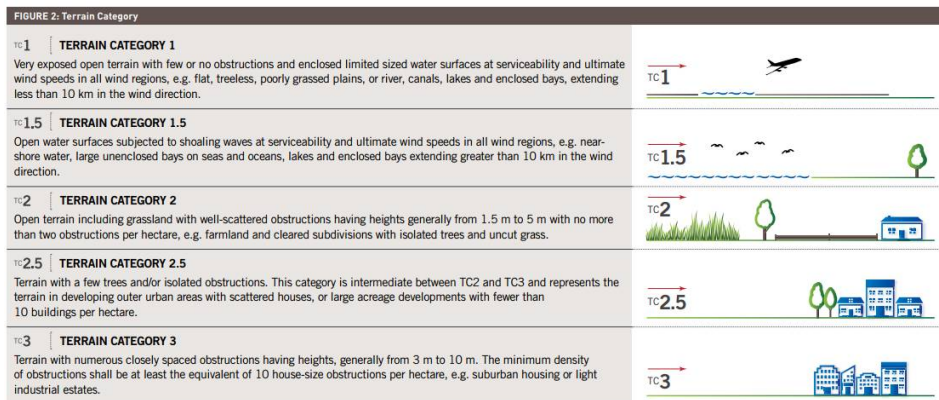
1.0 Context

Cyclones are a risk to northern coastal areas and nearby inland areas between October and April. They may cause damage through extremely high winds, flooding from widespread and intense rainfall, and in some cases storm surge. Major structural damage, injury or even death is possible, loss of electricity, water, communications and access through road and airport closures is also likely. Injury through flying debris (vegetation or metal from damaged buildings) is a real risk.

Refer Section 6 for detailed explanation.

2.0 Scope

This plan applied to OMSB. OMSB is situated in a Region D Terrain 2 cyclone region. As the area is developed its sub category may change and this plan will be updated accordingly.



3.0 Base Technical Profile

This section details a ready reference to technical details of the base that are relevant to this CMP;

- OMSB's wharf wall is +4.3m AHD
- HAT at OMSB is +3.07m AHD
- LAT at OMSB is +0.09m AHD
- Highest point on the base is +5.21m AHD at the south eastern corner of the base. See appendix 6 for full layout

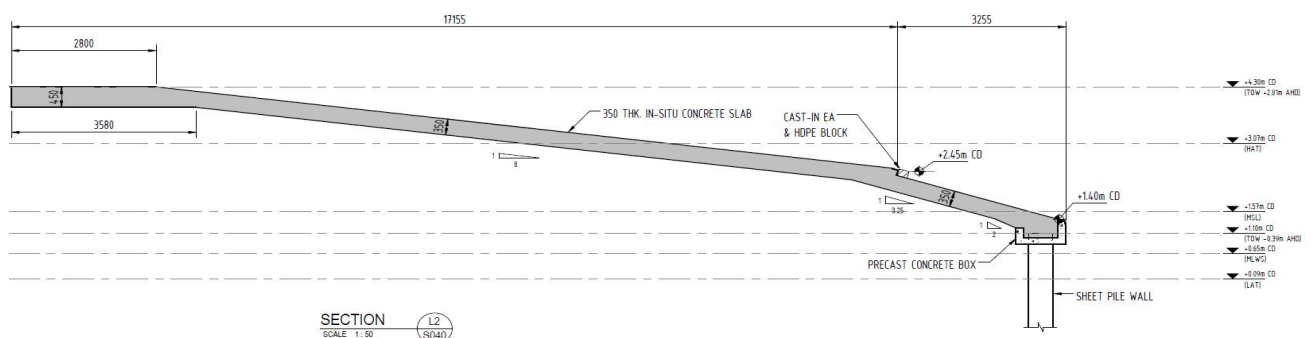


Figure 1 Tide Profile at LCT Ramp

4.0 Purpose

The purpose of this plan is to:

- comply with the Crisis and Emergency Response Standard and Guidelines for Cyclone Response Planning;
- provide instructions to personnel with responsibilities for cyclone response preparation; and
- ensure all Agility Project Logistics personnel, contractors, visitors and equipment, are as safe and free from hazards as is practicable during a cyclonic event.

5.0 Glossary of Terms

<i>Blue Alert</i>	Get Ready for a cyclone. You need to start preparing for cyclone weather.
<i>Yellow Alert</i>	Take action and get ready to shelter from a cyclone. You need to prepare for the arrival of a cyclone.
<i>Red Alert</i>	Take shelter from the cyclone. You need to go shelter immediately.
<i>All Clear with Caution</i>	The cyclone has passed but take care. Wind and Storm surge dangers have passed but you need to take care to avoid the dangers caused by damage.
<i>Cyclone Watch</i>	Is used when damaging winds or gales are expected to affect communities within 48 hours
<i>Cyclone Warning</i>	Are issued when damaging winds or gales are likely to affect communities within 24 hours
<i>BoM</i>	Bureau of Meteorology
<i>GM</i>	Agility General Manager
<i>DFES</i>	Department of Fire & Emergency Services
<i>LEMC</i>	Local Emergency Management Committee
<i>SES</i>	State Emergency Service
<i>LAT</i>	Lowest Astronomical Tide
<i>HAT</i>	Highest Astronomical Tide
<i>AHD</i>	Australian Height Datum

6.0 Explanatory Information – Cyclones

A tropical cyclone is a low pressure system that has well defined clockwise wind circulation. The region surrounding the centre, has gale force winds with a sustainable wind speed of 63km/hr or greater and wind gusts in excess of 90 km/hr. When the sustained wind speeds, around the centre, reach 119km/hr or greater with wind gusts in excess of 170km/hr, the cyclone is known as a SEVERE tropical cyclone.

The “eye” of a cyclone is an area characterised by light winds and often clear skies.

The diameter of the eye can extend from 10 km to 100 km. It is important to remain inside, when the eye of the cyclone passes over head, this lull is closely followed by destructive winds from a different direction.

For a cyclone to form, the sea surface temperature must be above 26.5°C. Tropical cyclones affecting the North West coast of Western Australia are known for their erratic behaviour, changes in wind speed and course direction can occur suddenly. Graphical representation of past cyclones demonstrates patterns of loops and sharp turns.

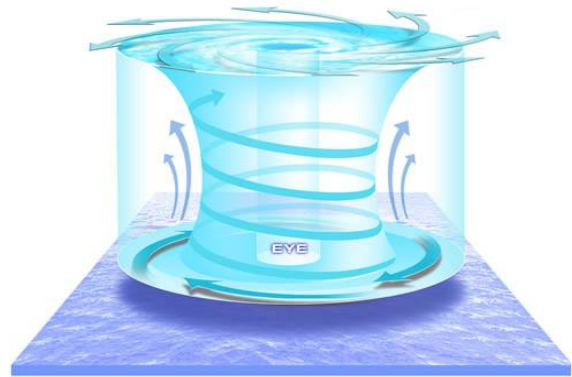


Figure 2 Structure of a Cyclone (Schematic) – Bureau of Meteorology

Tropical cyclones can last from a few days up to two or three weeks and usually dissipate over land or colder ocean areas. Tropical cyclones can bring heavy rainfall, causing rivers to flood with resulting in damage to roads and property.

Destructive winds can produce seas which are dangerous for vessels, both out at sea or moored in harbours. A severe tropical cyclone can have wind gusts exceeding 280km/hr.

A storm surge is defined as a raised dome of water about 60 to 80 km in width and 2 to 5 metres higher than the normal tide level. If the storm surge occurs at the time of a high tide then the area inundated with water can be extensive. Flooding caused by a storm surge is rapid and powerful. HAT at OMSB is 3.07 metres.

6.1.1 Cyclone Warning

The Bureau of Meteorology (BoM) has three cyclone warning centres located in Perth, Darwin and Brisbane which provide a tropical cyclone warning service.

The BoM warning service enables communities and businesses to prepare in advance should a cyclone affect their area. This advice, is general in nature, and acts as an aid for each community to assess the possible risk the cyclone poses for their area.

The amount of damage a community or business sustains is dependent on the following:

- how far the community/business is from the zone of maximum wind speed;
- how exposed the location is;
- if the buildings are constructed to Australian Standards for cyclone areas;
- the type of vegetation in the area; and/or
- the likelihood of resultant flooding

6.1.2 Tropical Cyclone Outlook

Each Tropical Warning Centre issues a daily statement giving a 3 day outlook on possible tropical cyclone development in their region and surrounding oceans. If a cyclone exists in the Australia region, but is not expected to threaten any coastal or island communities in the next 48 hours, a bulletin is issued every six hours that includes the cyclones name, current location and forecast movement.

6.1.3 Cyclone Watch

A cyclone watch is issued by the BoM and broadcast by local radio stations every six hours whenever there is a possibility a cyclone may produce gale force winds on the coast or in island communities within 48 hours (but not within 24 hours). The advice will give details of the communities likely to be affected, the cyclone location, intensity, severity category rating and movement.

6.1.4 Cyclone Warning

A cyclone warning is issued by the BoM and broadcast by local radio stations, every three hours, when a cyclone may produce gale force winds on the coast or affect island communities within 24 hours.

In addition to the information provided in the watch, the advice gives details of expected wind gusts, forecasts of heavy rainfall and abnormally high tides for the area. Communities are advised to commence preparations to ensure the safety of their people, animals, property and equipment.

When a cyclone is under radar surveillance close to the coast, hourly advice may be issued. State Emergency Services will issue community alerts during a cyclone warning phase and cyclone warnings are also telecast by television networks.

6.1.5 Standard Emergency Warning Signal

The Standard Emergency Warning Signal is an audible signal that is sounded on broadcast media in an emergency situation to gain public attention. This would typically occur in an area where a tropical cyclone is expected to affect a community within 12 hours. It is important to have radios tuned to local commercial stations or the ABC.

6.1.6 Cyclone Season

The BoM cyclone season commences on 1 November and concludes on 30 April the following year.

7.0 Accountability

7.1 Incident Controller (IC)

The Incident Controller shall be responsible for monitoring the event throughout its course, instructing and liaising with the Yard Warden as to appropriate action to be taken. The priority of the IC is to consult and instruct the YW regarding base preparation and evacuation priorities. At all times, the IC's aim should be to evacuate all site personnel (including contractors) to a safe location well in advance to the onset of a 'Red Alert'. All personnel including contractors are to evacuate site at 'Yellow Alert'.

Evacuation priority and location shall be determined in consultation with the YW. The designated primary cyclone shelter is:

- Onslow Multi Purpose Centre, Hooley Ave ONSLOW WA 6710
 - Category 1 & 2 shelter will be in own accommodation
 - Category 3 to 5 shelter will be in the town evacuation centre

The IC is also responsible for reporting cyclone preparedness promptly to the Agility General Manger.

7.2 Yard Warden (YW)

The YW shall be responsible for utilising cyclone preparation check lists (see appendix 2), ensuring check list action items are completed and maintain contact with the IC. The YW shall be responsible for ensuring all instructions from the IC are carried out and that all site personnel are aware of the cyclones progress and threat potential.

7.3 Communications Officer (CO)

The Communications Officer shall be responsible for monitoring the Track Maps and Alerts provided by the Bureau of Meteorology (BoM) and DFES and report the progress to the IC. The CO will also regularly check the Department of Main Roads website for road closure reports. This information is to be handed over for the daily Pre Start Meeting.

- Bureau of Meteorology website:
<http://www.bom.gov.au> (priority site)
- Department of Main Roads website:
<https://travelmap.mainroads.wa.gov.au/>
- Department of Fire & Emergency Services
<https://www.emergency.wa.gov.au/#>

The CO shall make all calls required to external agencies and relay information to the IC.

The CO is also to monitor that emails are operational and advise the IC of Port Status.

7.4 Site Personnel

Site personnel shall be responsible for informing the IC and YW of any information they have to hand relating to the possible formation of cyclones.

All site personnel shall be responsible for carrying out all instructions issued by the YW and reporting completion of the tasks delegated to them.

8.0 Preparation

8.1 Agility Pre-season

The OMSB 'Cyclone Pre-season' commences on 1 October and concludes on 31 October and involves a range of activities to ensure that the site and buildings are safe, people are prepared and the Cyclone Plan is rehearsed:

- A review of all cargo in the laydown will be taken and collated with cargo that is expected to arrive and depart. A time line will be prepared using current available data to forecast the nature of any cargo in the laydowns at a particular point in time, this will be known as the Cyclone Inventory.
- A cyclone tied down plan will be prepared by the Yard Warden using the cyclone inventory to determine the max exposure that is required to be secured in the event of a cyclone.
- As part of the analysis any small loose cargo shall be identified as being able to be moved from open laydown into the cyclone rated dome shelter. The cyclone inventory shall note this cargo as being subject to re-location in the event that this CMP is enacted.
- Once the max exposure is agreed, a review of securing equipment will be conducted.
 - This review is to include an analysis on the required numbers and types of equipment
 - A physical inventory check of the securing equipment held on the base
 - A physical check of the condition of the securing equipment including ensuring any inspection regimes have been maintained and registers updated for load bearing equipment
 - Any shortfall in requirements will be ordered and delivered to the base before the official cyclone season commences.
- all base permanent buildings including offices and amenities that have previously been anchored using approved engineers drawings/recommendation, shall be inspected and any deficiency in the engineered securing solution shall be noted and rectified. Engineering re-inspection shall take place if deemed necessary by the IC prior to the commencement of the official cyclone season.
- The securing solution for sea containers and loose cargo that is not identified as being subject to undercover storage shall be covered with nets which in turn will be anchored with ratchet tie down straps to concrete blocks. Any securing equipment assessment shall include sufficient nets, straps and concrete blocks.
- all outstanding action items are to be stored in a corrective action register to ensure action items are followed up and closed out during the pre-season cyclone period

8.2 Agility Cyclone Season

The Onslow Marine Supply Base 'Cyclone Season' conforms to the BoM period 1 November to 30 April.

During the cyclone season the IC and the YW will ensure that:

- the site is left in a tidy state at all times during these months with material that may become an airborne projectile left in readily securable locations;
- concrete securing blocks to be pre-staged to locations where they are expected to be required to facilitate expedited securing process in the event that this CMP is enacted.
- an inventory of available tie down straps is to be undertaken weekly to ensure that sufficient are available given the current cargo profile in the event the CMP is enacted.
- personal items are to be ready for collection in case an evacuation is ordered.

- reserve fuels to be obtained and stored in jerry cans – 100L Diesel and 30L ULP
- mobile phones are to be kept fully charged.
- evacuation routes are to be monitored including condition of the roads and heights of the rivers.

9.0 Cyclone Alerts and Considerations

Cyclone warnings issued for Onslow and surrounding areas are to be considered as warnings in this plan.

9.1 Bureau of Meteorology

During the cyclone season, when weather modelling indicates the formation of a cyclone, the BoM activate their Tropical Cyclone Warning Services and notify various agencies, including the Dept of Fire and Emergency Services (DFES), media outlets and designated Agility personnel of their forecasts.

DFES declares various cyclone alert levels, including 'Blue', 'Yellow', 'Red' and 'All Clear' that are then included in the BoM weather forecasts. Agility's decision to evacuate site will be based upon the information provided by DFES and the BoM.

9.2 DFES Alerts

DFES in conjunction with advice from BoM will release community alerts. As alerts are published it is expected that members of the community will act according to ensure their safety. To ensure that Agility complies with this best practice and to ensure that Onslow Marine Supply Base operations are made safe and all personnel are at either home or secure in cyclone rated accommodation, Agility will comply with these rated alerts but concurrently will run their own alerts so as not to be confused with the DFES community alerts.

At no time will Agility alerts be downgraded below the DFES alerts – See Appendix 1.

9.3 Agility Alerts

Agility will implement two alert stages during a cyclone event:

- Cyclone Ready Status – OMSB is still operational, however all non operational equipment is tied down and blocks are in place ready to tie down operational equipment.
- Cyclone Lockdown Status – OMSB is non operational and all items have been secured

9.4 BoM Cyclone – Categorisation

The following information has been taken from the Bureau of Meteorology website (2019) and should be considered in any decision making process in respective of site specific cyclone procedures.

Category	Wind Gust Strength	Central Pressure kPa	Typical Effects
1	90 - 125 kph	> 985	Negligible house damage, damage to some crops, trees and caravans.
2	125 to 164 kph	985 – 970	Minor house damage, significant damage to signs, trees and caravans, risk of power failure. Small craft may break moorings
3	165 to 224 kph	970 – 945	Some roof and structural damage, some caravans destroyed. Power failure likely.
4	225 to 279 kph	945 – 920	Significant roofing loss and structural damage, many caravans destroyed and blown away, dangerous airborne debris, widespread power failures.
5	> 280 kph	< 920	Extremely dangerous with widespread destruction.

Note: At all times the lists/instructions below may be truncated or modified by the IC and YWso as to deal with any changes to the cyclonic event. Cyclones are a dynamic weather event and a dynamic response may be required.

All site personnel, including contractors will be under the supervision of the Incident Controller from the Cyclone Watch period until the all clear is given.

9.5 Flood Considerations

The impact of a flood will significantly impact the options available to relocate or not relocate personnel from accommodation. The flooding of dry creeks and rivers can occur quickly in the Pilbara and may be due to either localised rainfall or significant rainfall to the north of the Pilbara, (including the Kimberly), that flows southwards.

9.6 Storm Surge

Onslow is vulnerable to storm surge and in 1999 TC Vance produced a 4-metre storm surge caused significant damage to the Onslow Township. The consequence of storm surge is higher when:

- the eye of the cyclone passes just to the south of Onslow
- the eye of the cyclone impacts at the same time as a 'high tide'.

This vulnerability must be considered prior to making any decision to relocate personnel when the conditions listed above are present. In such circumstances, an alternate refuge may be utilised.

10.0 CMP Activation

10.1 Time Critical Decision

Once a cyclone has been named and deemed a threat, the IC will initiate a meeting with the YW and the Agility General Manager to confirm the level of preparedness of the site.

Cyclone Alert Status will be reported through the daily Pre Start Meetings.

10.2 Individual Relocations

Should individual personnel wish to leave or relocate from Onslow prior to the decision being made to evacuate / close the base, the IC is to remind them of the base evacuation considerations and that they should apply these principles of risk endangering their lives unnecessarily. Should the individuals insist on leaving the area they will do so at their own risk. Any personnel relocations to be recorded in the Cyclone Personnel Log (Appendix 4)

10.3 Prudent Over Reaction

Agility's policy to protect its people when alerted to the threat of a tropical cyclone is one of 'prudent over reaction'.

11.0 Response Arrangements

The relevant OMSB Emergency Response Plan provides the framework for Agility to manage the preparation, response to, and recovery from unscheduled events. It provides guidance on the interface with stakeholders and emergency service organisations.

Details of these arrangements are maintained in the appropriate plan and should be referred to in any incident or event whereby Agility personnel or operations are adversely affected by cyclonic events.

A written record for each completed task/action is to be made at every stage of the cyclone, noting the date and time. This can be completed via the Cyclone Checklist (Appendix 2) or via email reporting to Agility GM.

11.1 Response Arrangements – Task Matrix

IC = Incident Controller
YW = Yard Warden
CO = Communications Officer

P = Primary
S = Support

	IC	YW	CO
Cyclone Ready			
Maintain contact with DOT on Port Status	P		S
Maintain contact with any planned vessel arrivals	P		
Maintain contact with any vessels moored alongside	P		
Liaise with other Port users on their CMPs - see ERT cards for contact numbers	P		
Maintain contact with site personnel - including offsite personnel	P	S	
Monitor advices and alerts from BOM and DFES			P
Monitor road conditions in preparation for possible evacuations			P
Pump out DG sumps		P	
Liaise with Waste Provider to remove DG waste ISOs from site		P	
Tie down items as per checklist		P	
Maintain fuel reserves as per CMP		P	
Fill drinking water reserves		P	

	IC	YW	CO
Blue Alert/Cyclone Lockdown - As above and:			
Confirm vessels are ready to leave Port if directed	P		
Mobile phones and satellite phones on at all times	P	P	P
Preparation for evacuation of mobile equipment if unsafe on base		P	
Keep company vehicles fully fuelled		P	
Communicate with transport providers to cease deliveries and hold trucks in a safe area		S	P
Notification to personnel of available emergency shelter options	P		S
Contractors to remove equipment and evacuate site		P	S
Ensure contractors have completed cyclone prep on any mobile cranes left on site		P	
Move vehicles remaining onsite to high ground		P	
All onsite personnel recalled to site office and information regarding plans for shelter collected in Cyclone Personnel Log	P		S
Yellow Alert - As above and:			
Pre-emptively establish contact with the relevant SES depot responsible for coordinating any emergency response	P		S
Isolate site services as per Checklist		P	
Evacuate all personnel from site	P	S	
Red Alert - As above and:			
Update record of Cyclone Event and communicate status with GM	P		
Maintain contact with Site Personnel where possible	P	S	
Monitor for All Clear	P	S	

12.0 Recovery Arrangements

12.1 Recovery Management

Once the All Clear has been received a base inspection will be undertaken by the IC and YW.

Given the susceptibility of the base to succumb to storm swell an initial inspection of the state of the access and yard surface will be conducted only using a 4x4 vehicle. Once it is deemed access to the base is safe for other vehicles then the IC will give the all clear to the remaining resources.

The IC is responsible for recovery arrangements including:

- communication of base status to vessels scheduled to call, DOT and Ashburton VTS
- ensuring all storm water has been pumped from DG sumps into waste ISO tanks as a contingency to contamination
- yard clean up
- offering EAP counselling for personnel and their families
- internal and external communications;
- regulatory compliance
- allocation of roles for the Emergency Response Team

Post cyclone a Team Based Risk Assessment (TBRA) is to be carried out including all site personnel and permanent contractors to identify potential hazards associated with damage from the storm before recommencing.

Note: Under NO circumstances is the generator to be switched on before visually inspecting the entire area for damage and carrying out the TBRA. People have been killed by live wires after cyclones.

12.2 Emergency Response Team (ERT) Roles

The ERT is responsible for overseeing the initial recovery management of personnel, equipment and other aspects of the operation that may have been affected by the cyclone. The site assessment and issue of 'All Clear with Caution' may be a necessity and be managed by the ERT pending the re-establishment of communications. The role of the ERT in recovery management includes:

- the wellbeing of personnel who may have been within the tropical cyclone's impact zone;
- the safety of work sites;
- the safe re-occupancy of work site; and
- the relocation of personnel if required.

12.3 Counselling

The provision of counselling services is provided via the Agility Employee Assistance Program – Access EAP.

The IC will make all personnel aware of the services available through this program.

Appendix 1 – Cyclone Alert Stages

CYCLONE READY

Preparation

A cyclone has been named and deemed a possible threat
All non operational equipment to be tied down
Remove all unnecessary rubbish and loose material from the work area

CYCLONE BLUE ALERT/CYCLONE LOCKDOWN

Tie Down

A cyclone is being monitored and may affect our area
Secure all remaining equipment and cease operations

CYCLONE YELLOW ALERT

Evacuation

A cyclone is likely to affect the safety of people and security of the operation
All services to the base are isolated and base is fully evacuated

CYCLONE RED ALERT

Shelter

A cyclone is imminent
Base is closed
Entry to the base is not permitted until all clear received

CYCLONE ALL CLEAR

Return to Work

The cyclone has passed
The TBRA has been completed and the Incident Controller and Yard Warden have determined that it is safe to return to work.

Appendix 2 – Cyclone Preparation Checklist

Step	Activity to check	Responsible Person	Completed Date/Time
Cyclone Pre Season 01 – 31 October			
1	Update Cyclone Inventory		
2	Order in requirements for the season		
3	Tie down fixed items ie: containers, buildings		
4	Check condition of engineered cyclone tie downs		
5	Identify storage of client assets on site		
6	Service Generator		
Cyclone Ready			
1	Tie down non operational items		
2	Have blocks in place for further tie down requirements		
3	Stock emergency supplies and charge all batteries		
4	Clear area of loose materials		
5	Organise bins and ISOs to be emptied		
6	Ensure fuel reserves are stocked		
7	Fill drinking water reserves		
8	Fill all vehicles and generator with fuel		
Cyclone Blue Alert/Cyclone Lockdown			
1	Cover PC Monitors/TVs and remove laptops to safe location		
2	Manually back up data and remove disk from site		
3	Secure remaining operational equipment		
4	Secure vehicles – unregistered on site, registered off site		
5	Isolate fuel supply		
6	Isolate services to Base ie: power/water		
Cyclone Yellow Alert			
1	Advise Agility GM of Base Closure		
2	Communicate Base status to vessels in Port or potential arrivals		
3	Communicate status to inbound transport/freight		
4	Account for all personnel on Base and record movements in Cyclone Personnel Log		
5	Evacuation of Base		
Cyclone Red Alert			
1	Base closed – no person permitted onsite until All Clear Received		
Cyclone All Clear			
1	Complete Team Based Risk Assessment		
2	Status report of the Base to Agility GM		
3	Inform all personnel of return to work when safe to do so		

Appendix 3 – Cyclone Situation Report

Site Details:		Name:	
Phone:		Fax:	
Email:		UHF Channel:	
Day:	Date:	Time:	
Incident Controller:			
	Phone:	Mobile:	
Yard Warden:			
	Phone:	Mobile:	
Cyclone Response Activity:		Current Major Issues:	
<input type="checkbox"/> Cyclone Ready <input type="checkbox"/> Cyclone Blue Alert/Cyclone Lockdown <input type="checkbox"/> Cyclone Yellow Alert <input type="checkbox"/> Cyclone Red Alert <input type="checkbox"/> Cyclone All Clear			
People and Logistics			
People	No. of people on site:		
Self Evacuees	Total No. (Signed out)		Total No. (Not signed out)
Today's Pre Start	Attached:	Yes / No	Time of Pre Start: am/pm
Transportation	No. of vehicles on site:		
Utilities and Services Status:			
Fuel	Supplies (in days):		
Electricity	Serviceable:	Yes / No	
Potable Water	Supplies (in days):		
Radio	Serviceable:	Yes / No	
Sewerage System	Serviceable:	Yes / No	
Telephone	Serviceable:	Yes / No	
Internet	Serviceable:	Yes / No	
Injuries / Damage Report:			
Injuries:			
Damage:			

