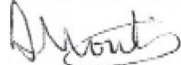



Risk Assessment & Method Statement

Working on a Wind Farm (Offshore)

Document Number: AT RAM 008
 Issue Date: 13/04/2023
 Review Date: 13/04/2026

Revision: SSE 1
 Complied by: Alex Mountain
 Reviewed/Authorised by: Peter King

Purpose:	This document details the method by which working on a windfarm is carried out. The document lists the steps carried out and documents/procedures/regulations followed. A risk assessment of the task is found in Appendix A.		
Summary of Changes	Rev1	29/05/21	If seat belts are available they are to be worn
	Rev SSE	09/04/23	1. Added text specific to SSE about the use of immersion (aka transit) suits Craning of Equipment has updated text about test-lifting loads 3. include entrapment hazard to '...transferring from the CTV to the WTG'. 4. Added note on CTV emergency drills Note added to follow SSE MCP for all transfers to and from the CTV
	Rev SSE 1	13/04/23	Added Appendix B – Method for Panoblade Inspection
Complied by:	Alex Mountain	27/03/2023	
Authorised by:	Peter King	09/04/2023	

1.

Daily sequence of works when operating on an offshore windfarm. A windfarm may be referred to a "Site" from here on in.

Documentation

1. Ensure all documentation is complete and all members of the team have read, understood and signed relevant method statement and risk assessment.
2. Complete rescue plans, daily tool box talks and point of work risk assessments. Ensure all team members are aware of where to locate the documents.
3. Ensure any site specific and AWP documents are available and completed accurately.
4. Establish within the team how to report the information required for the daily progress report and confirm who is responsible for communication to all relevant parties.
5. Report any safety observations using the agreed method refer to RAMS summary document

Driving

1. Be aware of and drive according to site rules refer to Job Specific Summary for speed limit details
2. When attending the site office park vehicles at designated locations adhering to any signed information. For example, reverse parking.
3. Take care when driving in harbour side locations – be aware there may not be barriers on edges of the harbour

Boarding the Crew Transfer Vessel (CTV)

1. Prior to boarding the vessel, confirm during the site induction what the PPE requirements are. This is likely to be: life jacket with PLB, helmet, safety boots and hi-vis
2. If the technician is new to the CTV, they will make themselves known to the skipper/deck hand who will induct them on the vessel and emergency procedures

Transiting to the Windfarm

1. Technicians will take direction from the skipper and deckhand whilst on the CTV
2. Wear a life jacket and PLB is going on deck
3. Where seat belts are available they must be worn
4. In rough conditions and when pushing onto the WTG, technicians are advised to remain seated

Transferring from the CTV to the WTG

All transfers to take place in line with *Annex J WI-GRGB-SHE-004-280 Marine Control Procedure*. The aforementioned document should be read and understood by all persons making transfers to and from the CTV.

A general description of the process is included below.

1. Prepare to transfer and climb the WTG ladder– put PPE on:
 - a. Immersion suit (if required according to site rules on water temperatures or other environmental or operational factors)*
 - b. Harness - with fall arrest hooks, work positioning device, and Knog Frog
 - c. Helmet

- d. Gloves
 - e. Life Jacket and PLB
 - f. Safety Glasses
2. Under the direction of the deck hand, technicians are to move to the front of the vessel. The deck hand will pull the fall arrest system on the ladder down for the technician to attach to
 3. When advised by the deck hand, attach to the fall arrest system using the Kong Frog and climb the ladder
 4. Where mid-way platforms are present, ensure an approved connection point is attached to with fall arrest hooks before removing the fall arrest device on the ladder. Once the device is removed, pull down and connect to the next fall arrest system on the ladder above, before disconnecting connecting with fall arrest hooks
 5. When the Transition Piece (TP) is reached, pass through the safety gate before disconnecting from the fall arrest system on the ladder
 6. A radio check is carried out between the team leader on the WTG and vessel skipper

* SSE rules dictate that Immersion suits (aka Transfer suits) are to be transferred by certified lift bags to the WTG/Substation/OTM when not worn for transfer, and remain available to all personnel at the place of work at all times.

Craning of Equipment

Two cranes will be used on the WTG – 1. TP to Boat, 2. Nacelle to TP. The following method is to be used for both cranes:

1. Familiarisation or specific training (identified in AT RAM 006 summary document) on the crane type is required before use
2. Equipment is to be packed evenly into approved and certified lifting bags
3. Prior to lifting, a slinger is assigned to attach the load to the crane hook
4. The crane operator will contact the slinger before lowering the hook, the slinger will ensure other team members are not in the vicinity, helmets are to be worn
5. The slinger will attach the load to the hook and move to a safe area while the load is test-lifted.
6. The lift will be carried out.
7. The process is reversed when lowering loads

Working Day

1. Prior to work commencing a pre-work brief is to be carried out by team leader with the site contact reaffirming specifics of works. An Authorised Technician (AT) will lead the work party and be responsible for the isolation and operation of the turbine
2. A daily tool box talk/prestart brief is carried out by team leader and briefed to team members
3. Radio and equipment checks are carried out
4. Works party will determine access method to Nacelle by way of turbine specific manlift or ascending ladder meanwhile adhering to manufactures guidance on operation or use for each method
5. If the turbine is in an acceptable condition to work on AccessTec will set up and begin operations
6. Once operations have concluded all equipment will be removed from the Nacelle
7. AT will return the WTG to service in line with the relevant AWP

Transferring from the WTG to CTV

1. Radio the CTV to advise the team are ready for collection

2. Make contact with the deck hand before descender the ladder – confirm they are ready to receive you and it is ok to climb
3. Attach to the fall arrest system on the ladders as detailed above
4. When climbing down the last 5 rungs on to the CTV, the deck hand will count you down until your feet are on the deck
5. As soon as you are on the deck, remove the Kong Frog from the fall arrest system
6. Do not loiter on deck, move inside the CTV ASAP

Demobilisation

1. Ensure all work tools, equipment, documents and waste are removed from the work site and packed correctly ready for transport/disposal.
2. If equipment is left onsite awaiting collection ensure it is packed properly and stored in a safe, agreed location and is secured and labelled correctly for collection by a courier. Where possible ensure any documents included in the package are available in an electronic format.
3. If any equipment/tools are stored in a vehicle, complete a thorough check prior to leaving site to ensure all equipment is present and accounted for and safely stored for transit.
4. Dispose of any waste according to agreed method refer to site summary.
5. Hand back any equipment/keys site have allocated to allow work to be completed. Where possible obtain written confirmation, the property has been returned.
6. Final check & communicate to site contact when leaving the site.

2. Technical Content of Job (SSOW)

All RAMS must be reviewed by the customer prior to deployment – any points requiring clarification will be addressed prior to the work commencing.

Work carried out in accordance with:

- Wind Turbine Safety Rules
- LOLER 1998
- PUWER 1999
- Work at height regulation 2005
- HASAWA 1974
- OEM Work Instructions

3. Safety Risk Assessment

AccessTec's employee risk assessment for the work is detailed in Appendix A. This details the hazards identified by AccessTec for its employees, that are relevant to this task and includes details of how the hazards are to be minimised/managed. The supervisor must ensure that all personnel involved in the work are aware of the possible dangers and precautions they must take to ensure that the identified risk is minimised.

The main risks that have been identified for the elements of work covered by the method statement are listed below together with relevant mitigation measures.

Working at Height: The principle hazard associated with this activity is falling. All work to be carried out using principles laid out in the Working at Height Regulations 2005 and AccessTec Safe Working & Operating procedure. Establish exclusion zone and secure tools and equipment that could be dropped from height.

Transiting to the windfarm and transferring from the CTV to the WTG: Hazards associated with this activity include drowning and entrapment. Technicians are to hold GWO sea survival and ensure they have been supplied with and wear the correct PPE.

Technicians will comply with the skipper and deckhands instructions when on board the CTV.

Weather:

The weather forecast that is to be used for the site in question will be agreed prior to work commencing. It is important that all parties involved in the task understand who has been nominated to check and monitor any risk from the weather. The nominated person could be; lead technician on site, site lead, AccessTec PM/PSO support and or client representative.

- **Wind**

The table below shows the maximum safe working wind speeds for the areas of the WTG that technicians will perform works in. The values below are 10-minute average wind speeds.

WTG Location	Spinner, Blade and Tower	Internal Nacelle	Internal Hub / Blade	Internal Tower	Craning Operations
Maximum average wind speed	TBC on site and recorded in AT RAM 006 summary document				

The work party may suspend works at lower wind speeds if they feel conditions compromise their safety at any point.

- **Gusting Wind Speeds**

Postponement or suspension of work should occur if any regular, repeated gusting in excess of 25% of the maximum average wind speed occurs or if the team deem the gusting conditions compromise the safety of the task.

- **Visibility**

Without continuous visibility between the nacelle and ground / sea level or vice-versa external rope access works must be postponed or suspended until the correct conditions are assured.

- **Precipitation (rain, snow, hail etc...)**

Precipitation should only be considered a safety concern for external works if:

- o Adequate clothing for the conditions has not been provided.
- o Electrical equipment is being used for the task.
- o The precipitation contributes to the deterioration of visibility to below safe values stated above.
- o The precipitation contributes to the deterioration of general safety.

If any of these criteria are met, then works should be postponed or suspended until a suitable safe solution can be arranged or conditions improve.

- **High Temperatures**

Due to the physical nature of working within a wind turbine, when working in high temperatures ensure adequate rest breaks and hydration of the team.

Adequate skin protection should be provided and used to prevent over exposure to the sun.

During periods of high temperatures, the teams should be regularly briefed on the hazards of working in extreme heat, including the symptoms and treatment of heat exhaustion.

Regular buddy checks to be performed while working to ensure the wellbeing of the work party.

-

Cold Temperatures

Suitable cold weather clothing should be provided and worn.

During periods of low temperatures, the teams should be regularly briefed on the hazards of working in extreme cold including the symptoms and treatment of hypothermia.

Regular buddy checks to be performed while working to ensure the wellbeing of the work party.

- **Lightning storm procedure.**

Before work starts, the local weather forecast will be checked. The forecast will determine whether the risk is:

Green: Low risk, no action required.

Amber: Medium risk, lightning should be monitored throughout the day by designated support staff

Red: High risk, technicians should move to the predefined safe area and await all clear from operations. No works are to take place until prediction returns to low risk and no strikes have been observed within 50 miles in the past hour. Monitoring is to take place for the remainder of the day.

System of monitoring lightning risk:

- Nominated person to check the agreed forecast.
- If a medium risk is identified, the designated person (identified on the project specific RAMS) will monitor any activity using [blitzortungLive](#) either on a laptop or a mobile phone. As a minimum, data should be checked half hourly.
- If a high risk is identified follow the [evacuation order \(see next page\)](#).
- Single team working on a remote site (no site support)- A portable lightning detector will be carried by each team.

If a strike occurs within 35 miles of the work party issue an immediate evacuation order to all rope access teams.

If the strike is between 35-50 miles from the work party, ascertain direction the storm is travelling. Once this is known and the location of the work team is within 180 degrees of the direction of the storm issue an immediate evacuation order to all teams.

If the storm is travelling 180 degrees away from the work party issue a readiness warning to all teams and continue to monitor closely for a minimum of 1 hour after lightning has left a 50 mile radius of the work location.

4. Safety Content

- Be mindful of surroundings, if the job changes stop the job and reassess the impact on your works
- Supervisor to communicate emergency plan and ensure everyone is aware of the plan
- Ensure good housekeeping is maintained
- Take part in emergency drills

If in any doubt liaise with client representative

<p>Emergency/Escape Plan</p>	<p>Refer to RAMS summary document. If rescue equipment is not present in the nacelle, it must be taken up with the work party</p> <p>All team members to have knowledge of wind turbine “safe area” in the event of lightning.</p> <p>All team members must familiarise themselves with the wind turbine evacuation procedure as well as the location of firefighting equipment.</p> <p>All team members must sign the tool box talk to indicate that they understand what their role will be in the event of an emergency.</p>
<p>First Aid</p>	<p>A first aid kit will always be available. All injuries and near misses, regardless of how minor is to be reported to customer and the AccessTec project manager.</p>



Risk Assessment & Method Statement

Working on a Wind Farm (Offshore)

Document Number: AT RAM 008

Appendix A – Risk Assessment

Task:	Working on a Wind Turbine	Initial assessment Date:	09/07/2020	Rev:	2	AT RAM 008
Location:	Offshore	Date of last review:	27/03/2023			
Author:	Alex Mountain	Date of next review	27/03/2026	Designation:		
Activities	Hazards	Initial risk rate Likelihood x Severity =	Safety Controls	Residual risk rate Likelihood x Severity =	Y/N	Action required Remarks

HAZARD CATEGORY – WHAT MIGHT GO WRONG												
		Member of public	Operatives	Other		Member of public	Operatives	Other		Members of public	Operatives	Other
1	Fall from height (person)		✓		17	Exposure to vibration *				Other Hazards		
2	Trip / fall on same level		✓		18	Repetitive motion / action				34	Risk of Service Strike – OHL & U/G	
3	Fall down stairs/steps		✓		19	Collision – moving objects/vehicles		✓		35	Trapped / Crushed body parts	✓
4	Struck by moving object		✓		20	Fire / flammable Atmosphere		✓		36	Confined Spaces	
5	Struck by falling object	✓	✓		21	Explosion				37	Access / Egress	✓
6	Collapse / overturning				22	Drowning		✓		38	Struck / trapped by Vehicles/Mobile Plant Movements	✓
7	Trapped between objects				23	Asphyxiation				39	Stuck by Winch Bond	
8	Strike stationary object				24	Loss of containment – liquid/gas				40	Exposure at sea	✓
9	Manual handling		✓		25	Adverse weather		✓		41	Working over water	
10	Contact with tools / equipment / etc				26	Sharp objects						
11	Contact with projectiles				27	Radiation *				43		
12	Contact with electricity		✓		29	Exposure to fumes / dust				Other Considerations		
13	Contact with air / water /pressure / pressurized gas / gas / liquid				30	Young persons						
14	Contact with heat / cold				31	New or expectant mothers						

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Activities	Hazards	Initial risk rate Likelihood x Severity =	Safety Controls	Residual risk rate Likelihood x Severity =	Y/N	Action required Remarks
		Likelihood x Severity =		Likelihood x Severity =	Y/N	Remarks

15	Contact with hazardous substance		✓		32	Environmental threat							
16	Exposure to noise		✓		33	Asbestos *							

Climbing Ladders and climbing between the nacelle and hub	Falls from Height	3x4 12 (Medium)	<ul style="list-style-type: none"> • GWO WAH training carried out. • Ensure fall arrest system is used and attached correctly to the harness. • Fall arrest hooks carried as a backup. • Ensure all correct PPE is worn 	1x4 4 (Low)	N	
Housekeeping	Slips/Trips/Falls	3x3 9 (Medium)	<ul style="list-style-type: none"> • Worksite and access routes to be kept clear of any material as often as is practical with consideration given to removal. • Suitable disposal areas to be identified and utilised for differing waste material. • All waste material to be removed from Turbine and taken back to Office for disposal in appropriate containers. • Technicians to be briefed at Tool Box Talks. 	2x3 6 (Low)	N	

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Activities	Hazards	Initial risk rate Likelihood x Severity =	Safety Controls	Residual risk rate Likelihood x Severity =	Y/N	Action required Remarks

Transferring to and from WTG from CTV	Struck or trapped by boat Drowning	4x4 16 (High)	<ul style="list-style-type: none"> GWO sea survival training. Only transfer when told to do so by deck hand. 	2x4 8 (Medium)	N	
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General Works at Height	Injury from dropped objects in general	4x3 12 (Medium)	<ul style="list-style-type: none"> Ensure an 'Exclusion Zone' is established prior to work commencement, and no conflict of activities occurs. Team lead responsible for establishing exclusion zone. Frequent monitoring of Exclusion zones, ensuring that adequate exclusion zones are maintained throughout project progression. Tools to be lanyarded Operate cranes in accordance with manufacturer's instructions and site procedures. Wear high visibility clothing. Ensure person slinging the load is aware of the presence team members and maintain communication between both parties. Use appropriate lifting bags. Adhere to site specific lifting plans. Ensure team leader establishes exclusion zone. Never walk under suspended load. 	2x3 6 (Low)	N	
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Author:	Alex Mountain	Date of next review	27/03/2026	Designation:		
Activities	Hazards	Initial risk rate Likelihood x Severity =	Safety Controls	Residual risk rate Likelihood x Severity =	Y/N	Action required Remarks

Manual Handling	Manual Handling Injury/Sprain/Muscular injury	3x3 9 (Medium)	<ul style="list-style-type: none"> Assessment of items to be made prior to physical lift/pull, where in doubt a Manual handling task risk assessment to be carried out. Technicians to have completed GWO manual handling. Items are to be lifted using cranes in the nacelle and on the TP. 	2x2 4 (Low)	N	
Turbine operation and isolation	Contact with electricity	3x4 12 (Medium)	<ul style="list-style-type: none"> The turbine is to be operated and controlled only by personnel authorised to do so under the WTSR Technicians will remain under the personal supervision of the AT 	1x4 4 (Low)	N	

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Working on site (all activities)	Contact with Chemicals – oil/grease leaks	3x4 12 (Medium)	<ul style="list-style-type: none"> Carry out pre-use checks of PPE as well as periodic (depending on conditions of use) and 6 monthly inspections as per LOLER Regulations. Consult with product manufactures as to the effects of the product on the material/equipment in question. Quarantine any damaged/potentially damaged equipment/PPE. Do not destroy on site. AccessTec will dispose of equipment at the Bridgend office ensuring equipment is retired from the PPE management system. Ensure gloves are worn and wash hands before eating 	1x4 4 (Low)	N	
Working on site (all activities)	Noise from the client's infrastructure - damage to hearing	3x3 9 (Medium)	<ul style="list-style-type: none"> Adhere to site specific noise demarcation zones. Use Hearing Protection. Where in doubt use supplied ear protection. 	2x3 6 (Low)	N	
Working on site (all activities)	Fire in the vicinity of the work being carried out	4x3 12 (Medium)	<ul style="list-style-type: none"> Team members to be briefed on site emergency procedures in client induction prior to commencement of work. Emergency rescue equipment to be present in the nacelle GWO fire awareness training carried out NO SMOKING in the WTG 	2x3 6 (Low)	N	

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Transiting to the windfarm and transferring from/to the turbine	Drowning	3x4 12 (Medium)	<ul style="list-style-type: none"> PPE to be worn – life jacket, PLB ad survival suit when temperatures dictate GWO sea survival training carried out 	1x4 4 (Low)	N	
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Activities	Hazards	Initial risk rate	Safety Controls	Residual risk rate	Action required	

Working on site (all activities)	Adverse Weather – difficult transfers	4x4 16 (Medium)	<ul style="list-style-type: none"> Weather forecast assessed each day and communicated to on site personnel Nominated person to check/monitor the agreed forecast throughout the day Survival equipment on the turbine if required Lightning risk: Personnel ensure aware of changing conditions. Know and understand the adverse weather procedure. Know and understand the tower evacuation procedure/safe zones. At the first signs of lightning ie. thunder, make the job safe, leave the tower and go to a safe place as per local instructions. <p>High Winds:</p> <ul style="list-style-type: none"> Wind speeds shall be assessed prior to work being carried out. Work tasks shall be prohibited when wind speed limits are exceeded Refer to RAMs summary document for site specific windspeeds. Care shall be taken when opening all external doors. Nacelle doors shall not be opened when wind speed limits for that machine size are exceeded. 	1x4 4 (Low)	N	
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			<ul style="list-style-type: none"> Assess the wind conditions throughout the operation and maintain contact with the operational controller for weather updates and follow local instructions. <p>Extreme heat/cold:</p> <ul style="list-style-type: none"> Personnel shall be informed of the signs and indications of hypothermia. Duration of work shall be controlled depending on temperature. Personnel are provided with cold weather clothing, gloves, head protection. Ensure survival kits if used in service vehicles or turbines are intact. Buddy check colleagues' condition during the carrying out of the works 			
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Activities	Hazards	Initial risk rate Likelihood x Severity =	Safety Controls	Residual risk rate Likelihood x Severity =	Y/N	Action required Remarks

Driving on shore	Damage to vehicles and personnel.	3x3 9 (Medium)	<ul style="list-style-type: none"> • Drive vehicles in accordance with country legislation and site rules. •• AccessTec driving policy to be adhered to. •• Driver licence to be valid for vehicle being driven. •• Adhere to site driving rules and regulations. • Do not operate handheld devices while driving Vehicle serviced as per manufacturers guidelines. Perform weekly vehicle checks for visual defects. Drug and alcohol policy to be adhered to. 	2x3 6 (Low)	N	
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Activities	Hazards	Initial risk rate	Safety Controls		Residual risk rate	Action required
		Likelihood x Severity =			Likelihood x Severity =	Y/N Remarks

RISK RATING TABLE							
INCREASING LIKELIHOOD		➔					
INCREASING SEVERITY ↓			Very Unlikely 1	Unlikely 2	Possible 3	Likely 4	Very Likely 5
	Personal Injury Equipment or Property damage Environment Impact		Little or no chance of occurrence	Conceivable but would require multiple failure of systems & controls	Could happen when additional factors are present but unlikely to occur	Not certain to happen but additional factors may result in an accident	Almost inevitable that an accident would occur
	Negligible 1	No Disruption to operations	1 LOW	2 LOW	3 LOW	4 LOW	5 LOW
		Potential for slight injury					
		Potential for slight effect					
		Potential for slight damage					
	Slight 2	Brief Disruption to operations	2 LOW	4 LOW	6 LOW	8 MED	10 MED
		Potential for minor injury					
		Potential for minor effect Potential for minor damage					
	Moderate 3	Partial Shutdown	3 LOW	6 LOW	9 MED	12 MED	15 HIGH
Potential for major injury							
Potential for local effect Potential for local damage							
High 4	Disruption to operations	4 LOW	8 MED	12 MED	16 HIGH	20 HIGH	
	Potential for single fatality						
	Potential for major effect Potential for local damage						
V High 5	Major Disruption to operations	5 LOW	10 MED	15 HIGH	20 HIGH	25 HIGH	
	Potential for multiple fatalities						
	Potential for massive effect Potential for extensive damage						

"HUMAN FACTORS MUST BE CONSIDERED IN ALL TASKS, BUT THE RISK POTENTIAL IS NOT QUANTIFIABLE" CARRY OUT SITE SPECIFIC RA BEFORE WORK COMMENCES.

Risk	= the likelihood of the harm being realised	Rating	Key to risk rating:
Hazard	= something with the potential to cause harm	1-6	= Low
L	Likelihood/probability	8 - 12	= Significant / Medium
S	Severity	15-25	= Unacceptable / HIGH
R	Risk		
RR	Residual Risk Rating		

Appendix B – Method for Panoblade Inspection

The following is a supplementary method for work on an offshore wind turbine in the specific case of carrying out Cornis Panoblade inspections on Greater Gabbard for SSE

Obtain Approval to travel offshore from the Marine coordination centre
Travel offshore via transfer vessel as per procedure.
Standard Safety Rules for working on the vessels must be observed.
Vessel must call the LCC for permission to access location prior to transfer. Note: Turbine must be stopped remotely if it is a restricted asset.
Upon arriving at the offshore structure, wait until the vessel has come to a standstill and with permission from the skipper access the front deck.
Full climbing and transfer PPE must always be worn when transferring
When stepping from the vessel to the TP ladder the inertia reel must be presumed as uncertified and therefore double hooking must be used unless proof of certification has been obtained.
Climb TP ladder always ensuring clipped on
Once at the TP door, CT/AT is to enter the turbine, request consent to work from LCC and place turbine in local control. Turbine to be placed in hard stop.
Granada trained personnel to crane equipment from the vessel to the TP using the Granada crane.
Check to make sure the ladders and the skyman lift are certified/in date and pre-use checks conducted.
CT/AT is to remove the hand controller and lock and tag the local/remote switch at the A2 level.
Camera operator is to remain on the TP platform and set up camera and equipment.
If nacelle access is determined to be essential, the CT/AT will make their way to the nacelle and change valve 252 from operation to service.
Once ready the CT/AT will idle or use the turning gear to turn the rotor in to the inverted Y position (AKA Mercedes position) and apply the HS brake, as per the WI and ROP.
If necessary, the CT/AT might require to yaw the turbine to a suitable position using the hand controller terminal.
The camera operator is to start their inspection via telescopic camera. Once the first set of photos is complete, the CT/AT is to pitch the lower blades in to the run position, one at a time with the brake on.
All tools and parts to be accounted for during and at the end of the job.
CT/AT to crane down kit and place 252 valve from service to operation.
Descend tower.
CT/AT to remove lock and tag on remote/local switch on A2 cabinet and return turbine to remote. CT/AT to restart turbine (if not restricted).
CT/AT to inform LCC on completion of works and leave work order on hold.
Crane kit down to vessel using the Granada TP crane.
Transfer to vessel.