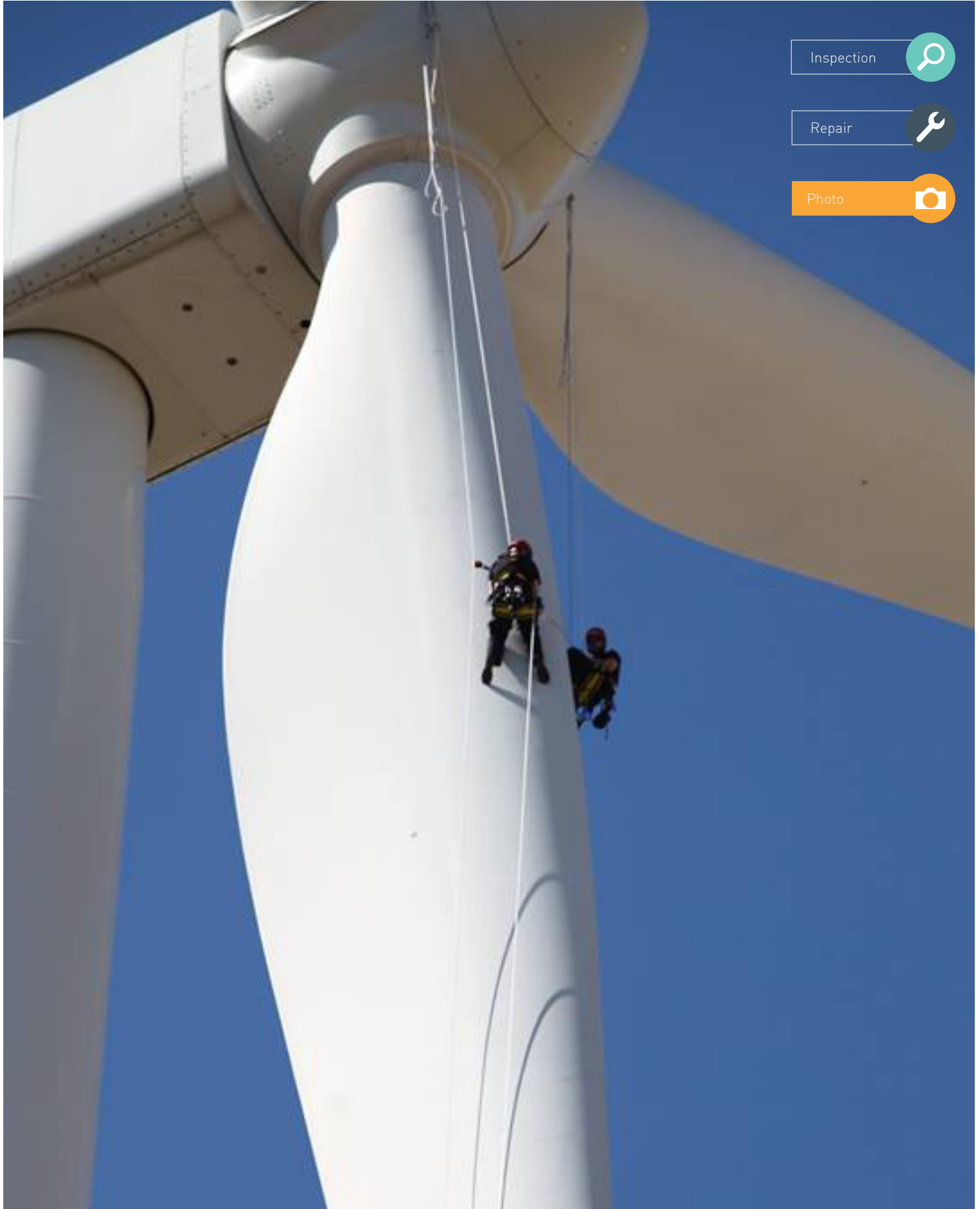
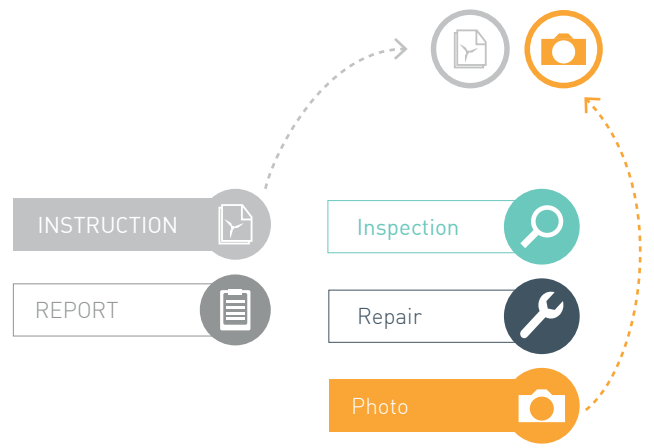




INSTRUCTION Blade Photos





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0 | INTRODUCTION

The purpose of this document is to specify the required standards of photos for use in Blade inspection reports and blade repair reports.

1 | CAMERA SPECIFICATIONS

Resolution: Minimum 20 mega pixel **or** full HD
Focus: Auto focus
Zoom: Optical zoom (do not use digital zoom)

The reason why digital zoom is not recommended is due to the fact that it simply only enhances the image. It does not scale down to the damage as optical zoom does. In other words, digital zoom is equivalent to zooming in on your phone with your fingers.

It is recommended to use a waterproof camera to protect the camera from any weather condition.

OTHER EQUIPMENT / TOOLS

Tools to be used in order to document the inspections and repairs can be a photocard and in addition to that a ruler sticker to measure the extend of the damage. If using a ruler sticker make sure that the measuring unit is in centimetre and write the damage number on it.

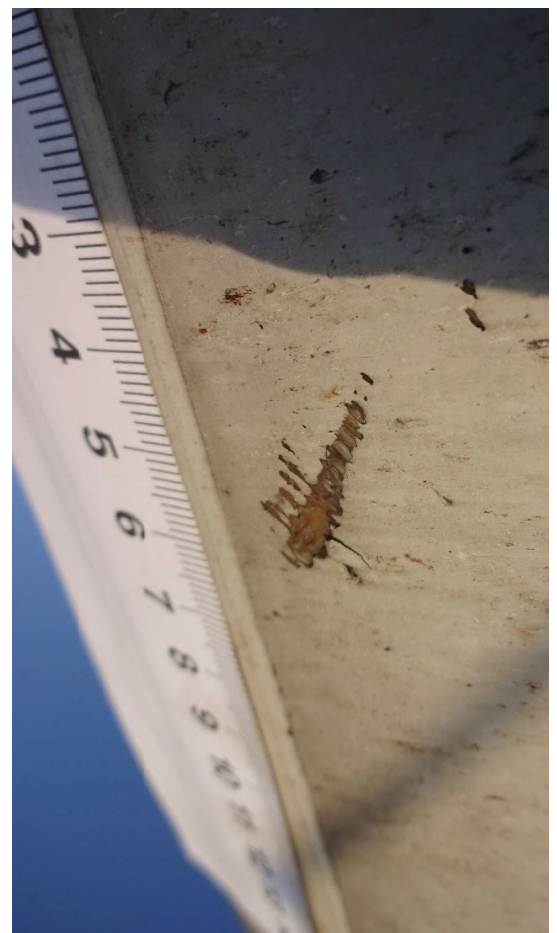


Figure: Stickers with a ruler in cm.



2 | HOW TO USE THE PHOTOCARD

The photocard is designed so that it is possible to write with a marker and later erase. However, to ensure the best quality of the photos it is highly recommended to use a dynamo machine to fill out the required information, which by using this method means that it can be filled beforehand an inspection or repair.

Date: Write day (DD), month (MM) and year (YYYY)
(eg. 05/05/2015)

Site: Write site name
(eg. BOWBEAT)

Company: Write service firm name
(eg. BLADENA)

Inspectors: Write technicians name
(eg. A.HANSEN)

Turbine no.: Write park ID. and serial number
(eg. 2304091)

Blade no.: Write Blade letter (A,B,C) and serial no.
(eg. 4007452- A)

Position: Turn wheel to right damage location
(eg. PS)

Distance from root: Turn wheel to right distance from root
(eg. 30m)

Damage Number: Turn wheel to right damage no.
(eg. 1)

Distance from LE: Turn wheel to right distance from LE.
(eg. 25%)

IMPORTANT! Keep the ROOT arrow pointed in the right direction
(Tip direction may also be used)

Measure 14-25cm

PS SS LE TE
Pressure Side Suction Side Leading Edge Trailing Edge



3 | REQUIRED PHOTOS OF A DAMAGE

Inspection photos and repair photos are covered in this section.

NAMING CONVENTION

Use the same convention as Repair report, but with a damage number (7) and photo number (8) in the end.

Filename = **sitename_turbine no_blade_report type_insp.type_date_damage no_photo no**
(1) (2) (3) (4) (5) (6) (7) (8)

Example

- | | |
|--------------------|---------------------------------|
| 1. Site name | Axeltofta |
| 2. Turbine no. | 12345 |
| 3. Blade | B |
| 4. Report type | INSP (in report REP) |
| 5. Inspection type | EX or IN (external or internal) |
| 6. Inspection date | 7. December 2015 |
| 7. Damage number | dam3 |
| 8. Photo number | pic2 |

This will give the following filename

Filename = **Axeltofta_12345_B_INSP_EX_20151207_dam3_pic2.jpg**

PHOTOS DURING BLADE INSPECTIONS

For each blade damage, at least two different types of photo documentation must be taken:

1. One or more photos of the damage with the photocard held next to the damage on the blade surface.
 - a. *The photocard must be correctly filled out (see later in this document).*
 - b. *The photocard must be positioned close to or touching the blade surface.*
 - c. *The photocard must be clearly readable.*
2. A relevant number of close-up photos of the damages without the photocard.
 - a. *Ruler-stickers can be applied here for measurement details on the damage.*
3. Overview photo of a large /long damage.
 - a. *Use a chalk and mark the damaged area to highlight the damage and take a overview picture*
 - b. *Take close up pictures. The outline of the chalk will be guiding the part of the damage on the close up pictures.*

PHOTOS DURING BLADE REPAIR

When it comes to blade repair, the damage inspection photos have already been taken. If they are not, they must be taken as described above.

The photos taken during the repair process must document every repair step with the photocard.



DOCUMENT DEVELOPED BY

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