

WFPS Performance Monitoring



Wind Farm Power Station (WFPS) Performance Monitoring Process Effective 1st October 2015

MAIN CHANGES from previous version published 1st February 2013

1. Changing the standard for APC in performance monitoring from ± 1 MW to the greater of +/-1MW or +/-3%.
2. AAP standard: rolling 14-day of 6%, 2 or more days of 6%.
3. Performance Monitor can close any issue without the Dispatch Test after analysing the WFPS recent performance and or associated information supplied by the WFPS.

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1. INTRODUCTION

The Wind Farm Power Station (WFPS) performance monitoring process is developed and effective since 1st February, 2013. This process follows the SEM Committee decision published on the “Principles of Dispatch and the Design of the Market Schedule in the Trading and Settlement Code” SEM-11-62 published on 26th August 2011 and the TSO operational policy Wind Farm Controllability Categorisation Policy published on 5th March, 2012.

Pre Requisite:

All TSO connected customers in Ireland must meet standards as set out in the relevant TSO Grid Code. All DSO connected customers in Ireland must meet standards set out in the ESB Distribution Code.

1.1 WFPS Categories

The Wind Farm Controllability categories apply to all TSO connected WFPS and those DSO WFPS under the Wind Farm Controllability Categorisation Policy¹ with exemptions as follows:

1. WFPS which are exempted from controllability requirements under the relevant Codes.
2. WFPS which are connected pre-Grid Code or pre-Distribution Code.
3. WFPS which are less than 5MW.

There are 3 categories of dispatch which are implemented by the control centres in a sequential manner for curtailment or constraint events. Non categorised WFPS are exempt from curtailment/constraint.

Category (i) - Category (i) is a WFPS that is not compliant with the Controllability requirements as set out by the relevant Grid Code. For WFPS with the active power control system not working, the TSO will dispatch the WFPS by the Wind Dispatch Tool.

- If this fails, for TSO connected WFPS, the TSO will dispatch the TSO connected WFPS by opening the circuit breaker or point of connection to the system.
- If this fails, for DSO connected WFPS, the TSO will request the DSO to disconnect the DSO connected WFPS by opening the circuit breaker or point of connection to the system.

Category (ii) - Category (ii) is a WFPS with controllability status compliant with the Controllability Requirements as specified by the relevant Grid Code. WFPS within Category (ii) under the TSO’s control will be dispatched via the TSO Wind Dispatch Tool on a pro-rata basis (pro-rata of Availability Active Power, not MEC or output).

Category (iii) - Category (iii) is a WFPS which has been recently energised and has a commissioning and testing programme which has been agreed by the TSO/DSO.

¹ <http://www.eirgrid.com/media/Wind%20Farm%20Controllability%20Categorisation%20Policy.pdf>

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1.2 Scope of the WFPS Performance Monitoring Process

This WFPS performance monitoring process is only applicable to units which are in Category (ii) as outlined above.

2. COMMUNICATION

There are 3 main points of contact relevant for this performance monitoring process:

- 2.1 Transmission connected wind farms in ROI
- 2.2 Distribution connected wind farms in ROI

2.1 Transmission connected wind farm in ROI

As set out in the TSO Grid Code and ESB Distribution Code, the TSO (EirGrid) is responsible for communicating performance monitoring issues directly with transmission connected WFPS. Where transmission connected WFPS in Ireland have any questions the contact address is:

Performancemonitor@eirgrid.com

2.2 Distribution connected wind farm in ROI

As set out in the ESB Distribution Code, the DSO (ESB Networks) is responsible for communicating performance monitoring issues with the distribution connected WFPS. Where distribution connected WFPS have any questions the contacts for the relevant ESB Networks person is given below:

performancemonitoring@esb.ie

Any queries in relation to this document, please contact the relevant TSO or DSO as per contact details above.

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3. DAILY PERFORMANCE MONITORING PROCESS

The following processes are effective on a daily basis for controllability category² (ii) WFPS from 01/08/2015:

- 3.1 Daily process applicable to TSO Connected WFPS in ROI
- 3.2 Daily process applicable to DSO Connected WFPS in ROI
- 3.3 Case examples (for demonstration purpose only)

3.1 Daily Process applicable to TSO Connected WFPS in ROI

STEP	DESCRIPTION	TIMELINE
1	<p>The TSO carries out performance monitoring each Business Day (BD) for the previous Day for Category (ii) WFPS. This check mainly includes identification of:</p> <ul style="list-style-type: none"> • A single non-compliance with an Active Power Dispatch Instruction(s). The TSO check if the WFPS has achieved the required Active Power Dispatch Instruction with the greater of an allowable tolerance of ± 1 MW or $\pm 3\%$ of their registered capacity. <p>and</p> <ul style="list-style-type: none"> • an inaccuracy of the Available Active Power (AAP) signal greater than the standard of 6% for 2 or more consecutive days, or a failure of the AAP signal is identified (i.e. it stops working) <p>Following identification of the above, the TSO then investigates whether the issue is associated with a communications problem <i>i.e.</i> SCADA or Remote Terminal Unit (RTU).</p> <ul style="list-style-type: none"> • If the issue is not associated with communications then TSO will carry out step 2. • If the issue is associated with communications, the TSO will address this issue and the TSO will take no further action against the wind farm. 	1 BD
2	<p>The TSO will issue a 10 days non-compliance notice to WFPS.</p> <ul style="list-style-type: none"> • The WFPS will have up to 10 business days from the issuance date of the 10 days non-compliance notice to rectify and confirm resolution with the TSO. • The WFPS shall investigate and communicate the cause of the non-compliance and the resolution required to regain compliance to the TSO. <p>To clarify, during the 10 days non-compliance notice period, the WFPS may contact the TSO to discuss their case further.</p>	10 BD

² <http://www.eirgrid.com/media/Wind%20Farm%20Controllability%20Categorisation%20Policy.pdf>

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3	On expiry of 10 days non-compliance notice period, the WFPS will now be subject to a dispatch test by the TSO. To clarify, the timing of the dispatch testing will be dependent on wind condition and position in the queue of wind dispatch testing taking place at the time.	Step 2 + dispatch test date
4	<p>During the period of the WFPS waiting for a dispatch test, the TSO will take into account the WFPS recent performance and or associated information supplied by the WFPS up to this point.</p> <p>The TSO may decide to close the 10 days non-compliance notice at any period during this step without carrying out a dispatch test. Otherwise, proceed to step 5.</p>	
5	<p>Dispatch test has been carried out with the WFPS.</p> <p>TSO will confirm the dispatch test result to the WFPS namely a Pass or a Fail.</p> <ul style="list-style-type: none"> • PASS: WFPS will remain in category (ii) where the dispatch test was a PASS and the TSO will notify the WFPS that the non-compliance is closed and no further action is required. • FAIL: Where the test was a FAIL the TSO will proceed with the transfer of the WFPS into category (i) and notify the WFPS of effective date. Proceed to Step 6. 	Dispatch test date + 10 BD
6	The WFPS will remain in category (i), once the WFPS has resolved the issue, it can request another dispatch test under the normal dispatch testing process to prove that the WFPS is now compliant.	As available
7	When a WFPS is deemed to have passed the dispatch test from step 6. The TSO will advise the WFPS of the effective date of moving back to category (ii).	Step 6 + 10BD

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3.2 Daily Process applicable to DSO Connected WFPS in ROI

STEP	DESCRIPTION	TIMELINE
1	<p>The TSO carries out performance monitoring each Business Day (BD) for the previous Day for Category (ii) WFPS. This check mainly includes identification of:</p> <ul style="list-style-type: none"> • A single non-compliance with an Active Power Dispatch Instruction(s). In other words, the TSO check if the WFPS has achieved the required Active Power Dispatch Instruction with the greater of an allowable tolerance of ± 1 MW or $\pm 3\%$ of their registered capacity. <p>and</p> <ul style="list-style-type: none"> • an inaccuracy of the Available Active Power (AAP) signal greater than the standard of 6% for 2 or more consecutive days, or a failure of the AAP signal is identified (<i>i.e.</i> it stops working) <p>Following identification of the above, the TSO then investigates whether the issue is associated with a communications problem <i>i.e.</i> SCADA or Remote Terminal Unit (RTU).</p> <ul style="list-style-type: none"> • If the issue is not associated with communications then the TSO will inform the DSO and the DSO will carry out step 2. • If the issue is associated with communications, the TSO will address this issue and the TSO will take no further action against the wind farm. 	1 BD
2	<p>The DSO (ESB Networks) will issue a 10 days non-compliance notice to WFPS.</p> <ul style="list-style-type: none"> • The WFPS will have up to 10 business days from the issuance date of the 10 days non-compliance notice to rectify and confirm resolution with the TSO. • The WFPS shall investigate and communicate the cause of the non-compliance to the DSO and the resolution required to regain compliance to the TSO. <p>To clarify, during the 10 days non-compliance notice period, the WFPS may contact the DSO to discuss their case further.</p>	10 BD
3	<p>On expiry of 10 days non-compliance notice period, the WFPS will now be subject to a dispatch test by the TSO. To clarify, the timing of the dispatch testing will be dependent on wind condition and position in the queue at the time.</p>	Step 2 + dispatch test date

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4	<p>During the period of the WFPS waiting for a dispatch test, the TSO will take into account the WFPS recent performance and or associated information supplied by the WFPS up to this point.</p> <p>The TSO may decide to close the 10 days non-compliance notice at any period during this step without carrying out a dispatch test. In this case, the DSO will notify the WFPS that the issue is now closed. Otherwise, proceed to step 4.</p>	
5	<p>Dispatch test has been carried out with the WFPS.</p> <p>TSO will confirm the dispatch test result to the WFPS namely a Pass or a Fail.</p> <ul style="list-style-type: none"> • PASS: WFPS will remain in category (ii) where the dispatch test was a PASS and the TSO will notify the WFPS that the non-compliance is closed and no further action is required. • FAIL: Where the test was a FAIL the TSO will proceed with the transfer of the WFPS into category (i) and notify the WFPS of effective date. Proceed to Step 6. 	Dispatch test date + 10 BD
6	<p>The WFPS will remain in category (i), once the WFPS has resolved the issue, it can request another dispatch test under the normal dispatch testing process to prove that the WFPS is now compliant.</p>	As available
7	<p>When a WFPS is deemed to have passed the dispatch test from step 6. The TSO will advise the WFPS of the effective date of moving back to category (ii).</p>	Step 6 + 10BD

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Important note for following the examples below:

If you are a transmission connected WFPS in ROI, your point of contact will be the TSO.

If you are a distribution connected WFPS in ROI, your point of contact will be the DSO. The TSO will communicate any non-compliance to the DSO who will in turn issue the non-compliance to the relevant WFPS.

3.3 Case Example 1 – An WFPS has an Available Active Power Issue

SEQUENCE OF EVENT	DESCRIPTION	TIMELINE
1	The TSO identified a Category (ii) WFPS from the daily performance monitoring process where the WFPS Available Active Power (AAP) signal had stopped working i.e. froze at a constant value. Figure 1: Available Active Power Issue with WFPS X	1 BD
2	The TSO investigates whether the issue is associated with a communications problem and found all communications signals were working at the time in question for the WFPS.	1 BD
3	The TSO or DSO will issue a 10-day non-compliance notice to the WFPS. At this point <ul style="list-style-type: none"> The WFPS will have up to 10 business days from the issuance date of the 10 days non-compliance notice to rectify and confirm resolution with the TSO or DSO. The WFPS shall investigate and revert back to the TSO or DSO as soon as possible the cause of the non-compliance and the resolution required to regain compliance. To clarify, during the 10 days non-compliance notice period, the WFPS may contact the TSO or DSO to discuss their case further.	10 BD
4	On expiry of 10 days non-compliance notice period, the WFPS is now subject to a dispatch test by the TSO.	11 BD
5	A dispatch test has been carried out by the TSO on 12 BD.	16 BD

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6	<p>The TSO confirm the dispatch test result to the WFPS</p> <ul style="list-style-type: none">• PASS: WFPS will remain in category (ii) and the TSO will notify the WFPS that the non-compliance is closed and no further action is required. WFPS revert to normal.• FAIL: The TSO will proceed with the transfer of the WFPS into category (i) and notify the WFPS of effective date. The WFPS should request a dispatch test following resolution. In order for the WFPS to move back to category (ii), the WFPS must pass the subsequent dispatch test	Step 5 +10 BD
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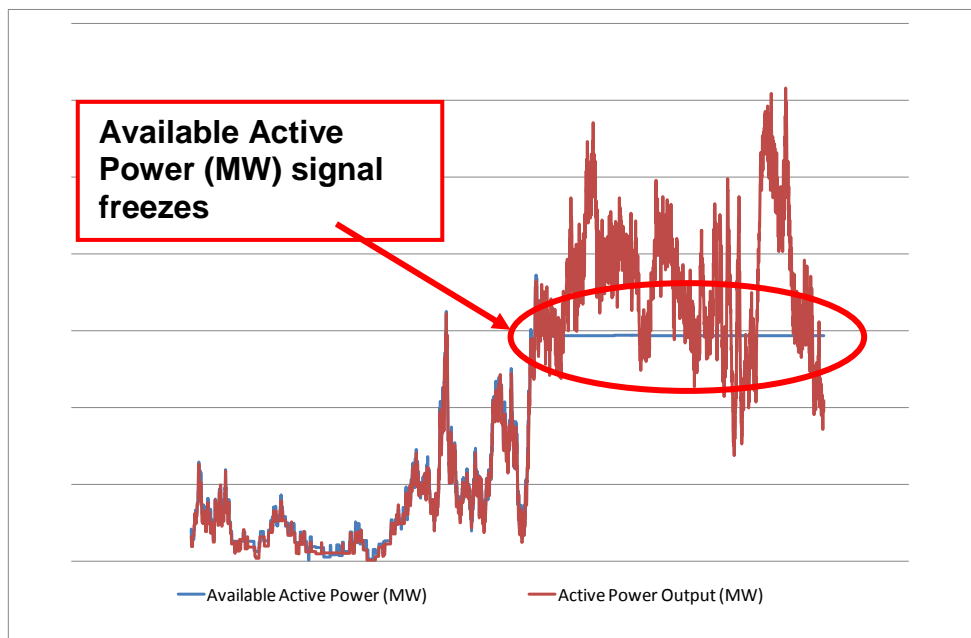


Figure 1: Available Active Power issue with WFPS X

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Case Example 2 – WFPS has an Active Power Dispatch Instruction Issue

SEQUENCE OF EVENT	DESCRIPTION	TIMELINE
1	<p>The TSO identified a Category (ii) WFPS from the daily performance monitoring process where the WFPS Active Power Dispatch Instruction does not comply with the standard:</p> <ul style="list-style-type: none"> • A single non-compliance with an Active Power Dispatch Instruction(s). The WFPS <u>has not</u> achieved the required Active Power Dispatch Instruction with the greater of an allowable tolerance of ± 1 MW or $\pm 3\%$ of their registered capacity. <p>Figure 2: Active Power set point issue with WFPS Y</p>	1 BD
2	<p>The TSO investigates whether the issue is associated with a communications problem and found all communications signals were working at the time in question for the WFPS.</p>	1 BD
3	<p>The TSO or DSO will issue a 10-day non-compliance notice to the WFPS.</p> <p>At this point</p> <ul style="list-style-type: none"> • The WFPS will have up to 10 business days from the issuance date of the 10 days non-compliance notice to rectify and confirm resolution with the TSO or DSO. • The WFPS shall investigate and revert back to the TSO or DSO as soon as possible the cause of the non-compliance and the resolution required to regain compliance. <p>To clarify, during the 10 days non-compliance notice period, the WFPS may contact the TOS or DSO to discuss their case further.</p>	10 BD
4	<p>On expiry of 10 days non-compliance notice period, the WFPS is now subject to a dispatch test by the TSO.</p>	11 BD
5	<p>A dispatch test has been carried out by the TSO on 12 BD.</p>	12 BD
6	<p>The TSO confirm the dispatch test result to the WFPS</p> <ul style="list-style-type: none"> • PASS: WFPS will remain in category (ii) and the TSO will notify the WFPS that the non-compliance is closed and no further action is required. WFPS revert to normal. • FAIL: The TSO will proceed with the transfer of the WFPS into category (i) and notify the WFPS of effective date. The WFPS should request a dispatch test following resolution. In order for the WFPS to move back to category (ii), the WFPS must pass the subsequent dispatch test. 	Step 5 + 10 BD

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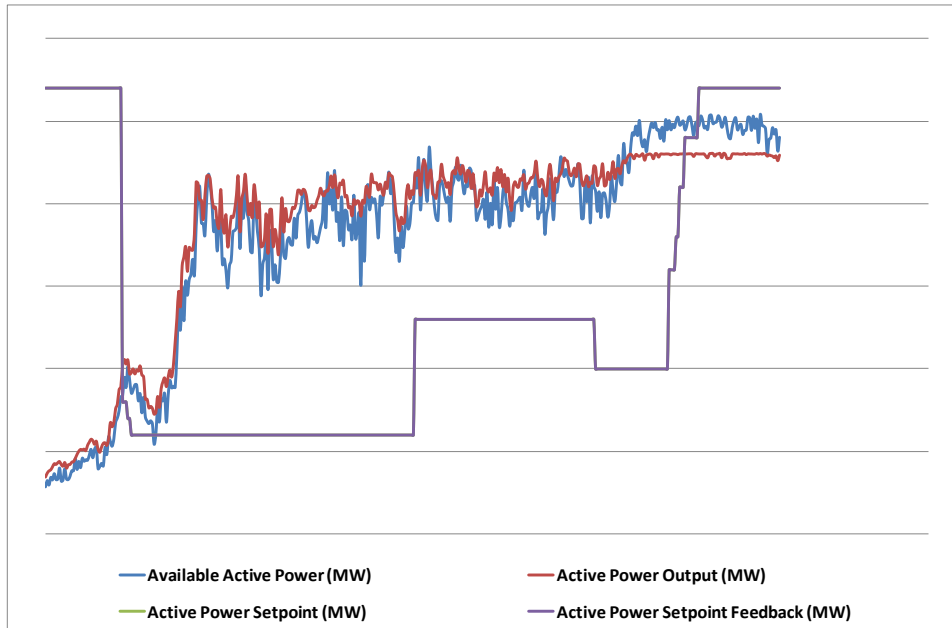


Figure 2: Active Power set point issue with WFPS Y

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4. MONTHLY PERFORMANCE MONITORING

The TSO prepares a monthly Performance Monitoring reports on all category (ii) WFPS. A summary report will be issue to the WFPS on a monthly basis.

The purpose of this report is to performance monitor:

- The Available Active Power signal quality is within the required standard³ (6%) as this is not covered in the WFPS performance monitoring daily process.
- The WFPS achieves the required Active Power dispatch instruction with the greater of an allowable tolerance of ± 1 MW or $\pm 3\%$ of their registered capacity.

The following process applies to all category (ii) WFPS effective from 01/08/2015:

3.4 TSO Connected WFPS Monthly Process applicable to TSO Connected WFPS in ROI

STEP	DESCRIPTION	TIMELINE
1	TSO will issue a summary of the reports including any actions required to the WFPS from the monthly process. There is no further action required from the WFPS if there is no performance issue reported.	Month End +10 BD
2	<p>The TSO in the monthly process checks for:</p> <ul style="list-style-type: none"> • A single non-compliance with an Active Power Dispatch Instruction(s). The TSO checks if the WFPS has achieved the required Active Power Dispatch Instruction with the greater of an allowable tolerance of ± 1 MW or $\pm 3\%$ of their registered capacity. <p>and</p> <ul style="list-style-type: none"> • an inaccuracy of the Available Active Power (AAP) signal greater than the standard of 6% for 2 or more consecutive days, or a failure of the AAP signal is identified (i.e. it stops working) <p>Following identification of the above, the TSO then investigates whether the issue is associated with a communications problem i.e. SCADA or Remote Terminal Unit (RTU).</p> <ul style="list-style-type: none"> • If the issue is not associated with communications then TSO will carry out step 3. <p>If the issue is associated with communications, the TSO will address this issue and the TSO will take no further action against the wind farm.</p>	Month End +10 BD
3	The TSO will issue a 10 days non-compliance notice to WFPS.	Month End + 10 BD

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	<ul style="list-style-type: none"> The WFPS will have up to 10 business days from the issuance date of the 10 days non-compliance notice to rectify and confirm resolution with the TSO. The WFPS shall investigate and revert back to the TSO as soon as possible the cause of the non-compliance and the resolution required to regain compliance. <p>To clarify, during the 10 days non-compliance notice period, the WFPS may contact the TSO to discuss their case further.</p>	
4	On expiry of 10 days non-compliance notice period, the WFPS will now be subject to a dispatch test by the TSO. To clarify, the timing of the dispatch testing will be dependent on wind condition and position in the queue at the time.	Step 3 + dispatch test date
5	<p>During the period the WFPS is waiting for a dispatch test, the TSO will take into account the WFPS recent performance and or associated information supplied by the WFPS up to this point.</p> <p>The TSO may decide to close the 10 days non-compliance notice at any period during this step without carrying out a dispatch test. Otherwise, proceed to step 6.</p>	
7	<p>Dispatch test has been carried out with the WFPS.</p> <p>TSO will confirm the dispatch test result to the WFPS namely a Pass or a Fail.</p> <ul style="list-style-type: none"> PASS: WFPS will remain in category (ii) where the dispatch test was a PASS and the TSO will notify the WFPS that the non-compliance is closed and no further action is required. FAIL: Where the test was a FAIL the TSO will proceed with the transfer of the WFPS into category (i) and notify the WFPS of effective date. Proceed to Step 8. 	Dispatch test date + 10 BD
8	The WFPS will remain in category (i), once the WFPS has resolved the issue, it can request another dispatch test under the normal dispatch testing process to prove that the WFPS is now compliant.	As available
9	When a WFPS is deemed to have passed the dispatch test from step 8. The TSO will advise the WFPS of the effective date of moving back to category (ii).	Step 5 + 10BD

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3.5 DSO Connected WFPS Monthly Process applicable to DSO Connected WFPS in ROI

STEP	DESCRIPTION	TIMELINE
1	TSO will issue a summary of the reports to the DSO including any actions required to the WFPS from the monthly process. The DSO will in turn communicate this to the WFPS. There is no further action required from the WFPS if there is no performance issue reported.	Month End
2	<p>The TSO in the monthly process checks for:</p> <ul style="list-style-type: none"> • A single non-compliance with an Active Power Dispatch Instruction(s). In other words, the TSO check if the WFPS has achieved the required Active Power Dispatch Instruction with the greater of an allowable tolerance of ± 1 MW or $\pm 3\%$ of their registered capacity. <p>and</p> <ul style="list-style-type: none"> • an inaccuracy of the Available Active Power (AAP) signal greater than the standard of 6% for 2 or more consecutive days, or a failure of the AAP signal is identified (i.e. it stops working) <p>Following identification of the above, the TSO then investigates whether the issue is associated with a communications problem i.e. SCADA or Remote Terminal Unit (RTU).</p> <ul style="list-style-type: none"> • If the issue is not associated with communications then TSO will carry out step 3. <p>If the issue is associated with communications then TSO will take no further action.</p>	Month End
3	<p>The DSO will issue a 10 days non-compliance notice to WFPS.</p> <ul style="list-style-type: none"> • The WFPS will have up to 10 business days from the issuance date of the 10 days non-compliance notice to rectify and confirm resolution with the TSO. • The WFPS shall investigate and revert back to the TSO as soon as possible the cause of the non-compliance and the resolution required to regain compliance. <p>To clarify, during the 10 days non-compliance notice period, the WFPS may contact the TSO to discuss their case further.</p>	Month End + 10 BD

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4	On expiry of 10 days non-compliance notice period, the WFPS will now be subject to a dispatch test by the TSO. To clarify, the timing of the dispatch testing will be dependent on wind condition and position in the queue at the time.	Step 3 + dispatch test date
5	<p>During the period the WFPS is waiting for a dispatch test, the TSO will take into account the WFPS recent performance and or associated information supplied by the WFPS up to this point.</p> <p>The TSO may decide to close the 10 days non-compliance notice at any period during this step without carrying out a dispatch test. Otherwise, proceed to step 6.</p>	
6	<p>Dispatch test has been carried out with the WPFPS.</p> <p>TSO will confirm the dispatch test result to the WFPS namely a Pass or a Fail.</p> <ul style="list-style-type: none"> • PASS: WFPS will remain in category (ii) where the dispatch test was a PASS and the TSO will notify the WFPS that the non-compliance is closed and no further action is required. • FAIL: Where the test was a FAIL the TSO will proceed with the transfer of the WFPS into category (i) and notify the WFPS of effective date. Proceed to Step 7. 	Dispatch test date + 10 BD
7	The WFPS will remain in category (i), once the WFPS has resolved the issue, it can request another dispatch test under the normal dispatch testing process to prove that the WFPS is now compliant.	As available
8	When a WFPS is deemed to have passed the dispatch test from step 7. The TSO will advise the WFPS of the effective date of moving back to category (ii).	Step 5 + 10BD

As noted in section 3 the daily performance monitoring process only identifies when the Available Active Power signals stops working

³ <http://www.eirgrid.com/media/QualityStandardforWindfarmActivePower.pdf>

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4 PUBLICATION AND CHANGE CONTROL

This document is developed jointly by TSO and DSO. It will be reviewed as required to maintain the effectiveness of the TSO Grid Code and ESB Distribution Code.

<i>Issue</i>	<i>Date</i>	<i>Record of amendments</i>
V 1.0	29/01/2013	Version 1
V 2.0	22/06/2015	Version 2

This document can be found on

EirGrid website:

<http://www.eirgrid.com/operations/gridcode/performancemonitoring>

ESB Networks website:

www.esb.ie/esbnetworks/en/generator-connections

5 ABBREVIATIONS

WFPS	Wind Farm Power Station
TSO	Transmission System Operator
DSO	Distribution System Operator
APC	Active Power Control
AAP	Available Active Power
SEM	Single Electricity Market
ROI	Republic of Ireland
ESB	Electricity Supply Board
BD	Business day