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Deputy Head of Maintenance and Engineering  
Kilroot Power Station  
Larne Road  
Carrickfergus  
BT38 7LX

21 December 2023

Our Ref: NET/E/DH/772

Dear Stephen,

**RE: Request by EP Kilroot for Derogations of KGT3 and KGT4 Generators at Kilroot Power Station, Regarding Compliance with Grid Code Clause CC. S1.1.3.2 (i) “rated power factor (lagging)=0.8”**

**Background:**

The Authority<sup>1</sup> has decided to grant this application by EP Kilroot Ltd (**EPK**) for Derogation. The Direction (the **EPK Lagging Direction**) and our reasons for making it are fully set out in this Decision Letter and an Annex to the Letter, both of which we will also publish.

The request (the ‘derogation request’) is in respect of two Open Cycle Gas Turbines (OCGTs) at Kilroot Power Station – KGT3 and KGT4. The Direction concerns section CC. S1.1.3.2 of the Grid Code, and the request from EP Kilroot that the Authority grants lifetime derogations from compliance with CC. S1.1.3.2 (i). It is stated in CC. S1.1.3.2 that:

*“For CDGUs and for CCGT Installations (in relation to the CCGT Modules therein) the Reactive Power capability shall as a minimum be:*

- (i) **Rated power factor (lagging) = 0.8;***
- (ii) **Rated power factor (leading) = 0.95; and***
- (iii) **Short circuit ratio not less than 0.5.”***

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<sup>1</sup> In this letter (and the direction found at the Annex) the words “Authority” “we” “our” “us” and “UR” are used interchangeably to refer to the Northern Ireland Authority for Utility Regulation.

Included in Condition 4(1) of EP Kilroot's Electricity Generation License<sup>2</sup> is the statement that the licensee has an obligation to *"comply with the provisions of the Grid Code and the Distribution Code insofar as applicable to it."* It is specified in Condition 4 (2) (a) that the Authority can issue a direction relieving the Licensee of its obligation to comply with applicable provisions of the Grid Code. EPK has confirmed, in communications with the Authority after the submission of the application, that they made this request in respect of Condition 4 of the EP Kilroot Electricity Generation Licence.

## Background

There is a summary included in the derogation request, of how non compliance with CC. S1.1.3.2 (i) was discovered. After a recent query to EPK by SONI concerning reactive power capability, limitations on KGT3 and KGT4 were identified, when they were pushed to the lagging MVar limitation, whilst at max gen on the generator capacity curve. The generator was not capable of achieving over a maximum of 0.83 (+28MVar) lagging power factor, without breaching the generator capability curve limits. Under CC. S1.1.3.2, the generator should be capable of providing 0.8 power factor lagging (+31.5MVar).

EPK states that the *"design characteristics of the generator capability prevent it from achieving a 0.8 power factor lagging at max gen"* and that the *"maximum lagging power factor KGT3/4 can achieve in all scenarios is 0.83 (28MVar @ 42 MW)."*

EPK has detailed in the derogation request that the non compliance described above appeared to be not identified at the time of *"installation, testing and commissioning"* of KGT3 and KGT4 – *"at this time compliance testing was completed and witnessed by SONI and AES Kilroot (Now EP Kilroot)."*

In follow up communication with the Authority (email of 23/03/2023), EPK commented that in testing at the time of the commission of the units (in 2009) *"appeared to confirm compliance (SONI/AES signed off charts for GT4 below) however it would appear max load available on the day of the reactive power testing was below that achieved for max gen and the lower Active power allowed the AVR to push the reactive power further."* The original query from SONI that

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<sup>2</sup> [The Northern Ireland Authority for Utility Regulation \(uregni.gov.uk\)](http://www.uregni.gov.uk)

triggered this testing was concerning the leading MVar capability, *“however on investigating this SONI noted the units were compliant for Leading MVar, but identified an issue with Lagging.....”*

It is stated in the derogation request that *“following discussion with SONI, it was agreed this was an oversight during commissioning and EP Kilroot should follow the derogation process to ensure the non-compliance is assessed and reviewed.”* EPK has outlined in the request that *“the non-compliance is inherent since the OCGTs were installed and commissioned in 2009.”*

As described, the units have been non compliant with CC. S1.1.3.2 since being commissioned in 2009. The identification of this in the derogation request has led to follow up queries for information by the Authority to EPK and SONI, and will be a subject of further communication after the issue of this Direction.

### **The Derogation Request and Assessment of Impacts**

EPK has requested the Authority grant derogation to EPK (and to SONI) from compliance with CC. S1.1.3.2, with KGT3 and KGT4 power factor lagging limited to 0.83. EPK has requested a lifetime derogation - *“As the limitation is inherent to the technical capability of the generators,”* and *“compliance is unlikely to be restored prior to the closure of the units given this is an inherent technical limitation that has been present since installation and commissioning in 2009.”*

One alternative action considered was upgrading the generator cooling system to facilitate an increase in the lagging MVar capability – however EPK describes this as *“cost prohibitive given the small increase in lagging MVar capability (+3.5MVar) and limited running of these units.”* In further communication with the Authority, these costs were quantified as \$36,000 for a generator rating change, \$2.24 million for a new T190-240 rotor, with implementation costs to be £2,000 a day (for 4 weeks). There would also be further costs for fuel for testing requirements, that are more difficult to determine.

EPK’s assessment of impacts found that there would be no impact on health and safety, and negligible impact on consumers, competition, sustainable development and government policy, by bringing *“the capability for Lagging MVar in line with the contracted DS3 value.”* EPK has adjudged there is a negligible impact on consumers and competition.

## Consultation With Other Parties

The Authority shared the derogation request with SONI and NIE Networks to obtain their comments:

SONI commented (in an email of 20 March 2023) that, in conducting an investigation into KGT3 not being able to provide leading MVARs below -11 - *“During that investigation I looked at the Grid Code requirements for both leading and lagging reactive power from KGT3 and KGT4 and it was then that it realised that the units could not meet the Grid Code requirement for lagging MVARs. After discussions with EP Kilroot and a review of the commissioning tests we understand that the units have never been capable of 31.5MVARs lagging and that a derogation should be requested. We are cognisant of the fact that this should have been requested at the time of commissioning, and even though a large amount of time has passed, we need to treat all Generating Units fairly which is why we have highlighted it to EPUK now. Unfortunately I don’t have the history of why this was missed at the time of commissioning and the staff involved then (2009) are no longer able to provide input.”*

In the submitted SONI Derogation Assessment Form, SONI comments that there are no system, security, reliability or stability implications to this derogation, as *“this is an isolated instance of non-compliance for a run-hour restricted peaking plant.”* The Derogation Assessment Form also includes the assessment that *“units have been operating to these limits since installation due to an oversight,”* and the units being considered compliant since installation *“seems to have been in error.”*

SONI also comments in the cost assessment, that *“the cost of remedying the non compliance would fall solely to the User and would not provide significant benefit to the system as per system operation today. These units are run hour restricted peaking units.”*

NIE Networks, in their response to the Authority (email of 20 March 2023) replied that:

*“As the derogation requested relates to how Kilroot Power Station delivers reactive power to the transmission system then this is primarily an issue for SONI to comment on. As this derogation relates to the performance of Kilroot Power Station in respect of the Transmission System, then NIE Networks have no*

*comment to make on the derogation requested by EP Kilroot in their documents dated 9<sup>th</sup> March 2023.”*

## **The Authority’s Decision**

We have considered the matters outlined in the Direction, our published 2017 Guidance on derogations<sup>3</sup> and our principal objective and general statutory duties, as set out in Article 12 of the Energy (NI) Order 2003. We have also taken into account that SONI has not expressed opposition to EPK’s Derogation request, and NIE Networks has had no comment to make on the derogation requested.

We have noted the comment in the derogation request that the state of non compliance with CC. S1.1.3.2 *“is inherent since the OCGTs were installed and commissioned in 2009.”* However as the derogation request, and follow up communications with EPK and SONI reflect, discovering and investigating the non compliance was prompted by SONI’s control rooms highlighting a separate issue with KGT3 (not being able to provide leading MVARS below -11). It was only after this discovery that it was *“realised that the units could not meet the Grid Code requirement for lagging MVARS,”* and that they *“never have been capable of 31.5MVARS lagging and that a derogation should be requested.”* SONI also commented *“we are cognisant of the fact that this should have been requested at the time of commissioning.”*

The stated non compliance of KGT3 and KGT4 will be addressed by the Authority in separate communications to EPK and SONI, after this Direction is issued.

We have come to the conclusion that, due to the difficulties cited (by EPK and SONI) in upgrading the system to a compliant state, and the potential lack of benefits to the consumer in doing so, it is appropriate to grant this request. EPK has stated, in the request, and in further information submitted, that compliance is unlikely to be restored during the lifetime of the units, via alternative action. SONI in their Derogation Assessment has stated that remedying the non-compliance would not provide significant benefit to the system, ‘as per system operation today.’

Having considered these matters, the Authority has decided to grant the Derogation request by the making of an appropriate direction in exercise of its

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<sup>3</sup> [Guidance Document on Derogations - February 2017.pdf \(uregni.gov.uk\)](#).

power under Condition 4 (2) (a) of the EPK Generation Licence, being satisfied that the derogation request is for the reasons offered by SONI, and is justified. The Direction:

- (a) is attached as an Annex to this letter
- (b) applies from 00.00 GMT on the date of issue of this decision
- (c) relieves EPK of any obligation it has to comply with the power factor lagging at max gen, as set out in Grid Code clause CC. S1.1.3.2 (i);
- (d) ceases to apply on and from the date that KGT3 and KGT4 can comply with the limits associated with CC. S1.1.3.2 (i), or such earlier date that the Authority shall determine by further direction.

For the avoidance of doubt, the direction now given only relieves EPK from its Condition 4 (2) (a) Licence obligation, in respect of compliance with power factor lagging at max gen, as set out in Grid Code clause CC. S1.1.3.2 (i).

The direction shall be entered and maintained in the Electricity Register,

Yours sincerely,



**Donald Henry**  
**Networks and Energy Futures Director**

## ANNEX

### DIRECTION UNDER CONDITION 4(2) OF THE LICENCE TO PARTICIPATE IN GENERATION OF ELECTRICITY HELD BY EP KILROOT LIMITED

**TO: EP Kilroot Limited**

#### **Whereas:**

- A. EPK Kilroot Limited (“**EPK**”) (“**the Licensee**”) holds an electricity generation licence (the “**Licence**”) granted to it on 14 June 2019.<sup>4</sup>
- B. Condition 4(1) of EP Kilroot’s Electricity Generation License<sup>5</sup> obliges the licensee to “*comply with the provisions of the Grid Code and the Distribution Code insofar as applicable to it.*”
- C. Condition 4 (2) (a) gives the Authority the power to issue a direction relieving the Licensee of its obligation to comply with applicable provisions of the Grid Code.
- D. The Authority has now made a direction (the **EPK Lagging Direction**)<sup>6</sup> granting EPK relief under Condition 4(2) of EPK’s generation licence from its obligation under Condition 4(2) of the EPK Generation Licence to comply with the provisions of the Grid Code, specifically the limits associated with CC. S1.1.3.2 (i), as they apply to the KGT3 and KGT4 Units at Kilroot, for the period commencing 00.00 GMT, on the date of issue of this decision.

#### **The Authority now directs as follows:-**

1. The Authority hereby directs that – pursuant to the power in Condition 4(2) of the Licence, the Licensee is relieved of its obligation(s) under Condition 4(1) of the Licence to comply with the limits set out in CC. S1.1.3.2 (i) of the Grid Code, in respect of the operation of the KGT3 and KGT4 Units.

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<sup>4</sup> [The Northern Ireland Authority for Utility Regulation \(uregni.gov.uk\)](http://uregni.gov.uk)

<sup>5</sup> [The Northern Ireland Authority for Utility Regulation \(uregni.gov.uk\)](http://uregni.gov.uk)

<sup>6</sup> The EPK Lagging Direction and the accompanying letter setting out the Authority’s reasons for making the Direction have been published and may be found on the UR website.

2. The relevant period is the remaining lifetime of the unit, from the date of this letter to the decommissioning date of the unit, or an earlier date the Authority may determine by a subsequent Direction.
3. The Authority may revoke, vary or replace this direction by a further Direction at any point.
4. The reasons for this direction are set out in a letter accompanying and published with it.

**Signed:**



**Name: Donald Henry**  
**Networks and Energy Futures Director**

**Date: 21 December 2023**

**Duly authorised by and on behalf of the Northern Ireland Authority for Utility Regulation**