

Accelerated Loss of Mains Change Programme

Guidance for Site Owners and Site Operators

BACKGROUND

Generation owners are required by the Distribution Code to install loss of mains (LoM) protection at their distributed generation sites. This is to ensure that, following a fault that isolates sections of the distribution system to which they are connected from the rest of the electricity system, distributed generation does not form an autonomous power island with the remaining local demand. Other faults elsewhere on the GB electricity system should not result in the operation of LoM protection.

In many cases, LoM protection is provided by means of a protection relay. However, some sites may have LoM functionality built in within the generation control system, eg within individual power electronic converters or inverters.

Depending on when your site has been commissioned, it may have its LoM protection responding to

- rate of change of frequency (RoCoF) that is less than 1Hzs^{-1} and/or has either no time delay or a time delay less than 500ms; or
- a vector shift (VS).

It was identified that loss of mains protection with these settings could inadvertently operate and trip your site following events that do not result in islanding. Not only that this would result in some loss of revenue at each site that has been unnecessarily disconnected from the system, but also the total generation loss at multiple sites could cause a significant system disturbance and a widespread loss of supply.

In order to minimise this risk, the distribution code has been changed to require that

- where the LoM protection responds to RoCoF, the applied setting should be 1Hzs^{-1} with a definite time delay of 500ms; and that
- VS protection is no longer used as means of LoM protection

WHAT YOU ARE REQUIRED TO DO

It is your responsibility to comply with the Distribution Code (and its associated document EREC G59) in order to fulfil the terms under which you connect to the distribution network and therefore you are required to review and make any changes to your LoM protection settings by no later than the end of August 2022 as specified in the latest Distribution Code and G59 modification.

You will need to liaise with your DNO/IDNO in order to either confirm you are compliant or to facilitate the implementation of any such changes.

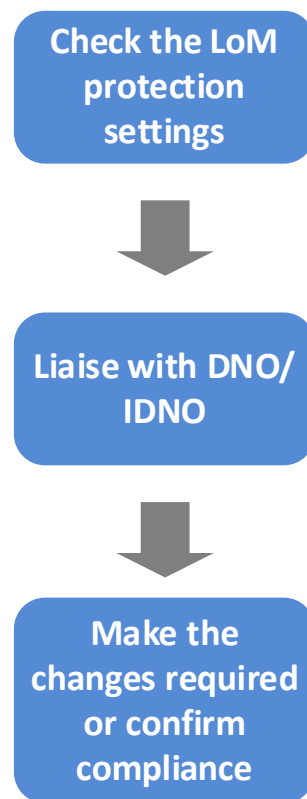


Figure 1: Your responsibility under the terms of your connection agreement and the Distribution Code

Check the LoM protection Settings

As a site owner/operator you should be able to identify the LoM protection settings either by inspecting all devices that provide LoM protection functionality at your site or by referring to the any documentation that were produced at the time of commissioning/maintenance.

If this is not feasible, you may wish to appoint an independent party to help you identifying the current settings. This independent party may be

- the person who commissioned the site,
- the person who does the regular maintenance at you site; or
- any other person that you appoint.

There is a list available on the ENA website [here](#) with parties who are willing to offer such service. Please note that it is your responsibility to conduct your own assessment as to the suitability of these contractors/consultants for the work required; that ENA and its members accept no liability or responsibility for the competence of any contractors/consulted listed below and do not endorse or make preference to any of the companies or individuals listed below; and that ENA and its member companies in publishing this directory provides no warranty or support of any kind and any loss, damages or other incurred from any work undertaken by them is the sole responsibility of the parties entering into contract with them.

Identify what needs to be changed

If the LoM protection is either of the type:

- VS; or
- RoCoF below 1Hzs^{-1} , with no time delay, or with a definite time delay less than 500ms,

you **must** change the LoM protection settings to meet the new requirements.

It is expected that the majority of sites affected are fitted with LoM protection that could be reset. The LoM protection at these sites **must be reset** to use 1Hzs^{-1} RoCoF relays with a definite time delay of 500ms.

However it is recognised that some sites may have their LoM protection provided by devices that cannot be reset. If these protection devices are used to provide LoM protection for synchronous generators¹ or for doubly fed induction generators², they **must be replaced** by new protection devices that comply with the new requirements. If these protection devices cannot be reset appropriately and are used to provide LoM protection for other types of generation, they **must have the LoM function disabled**.

Note that some generation types, particularly, but not exclusively, converters or inverters will include LoM functionality in the control equipment for the converters or inverter. These settings must be made to comply with the new requirements as well as any relay protection that might be on the site. In some cases, a site might comprise dozens or even hundreds of converters or inverters. In such cases, all the converters and inverters must be modified if this is necessary to conform to the new requirements.

Note that this programme does not cover any replacement to any converters or inverter itself as the work will need to be done through changing the logic of their control system (ie either resetting them or disabling the LoM function). If resetting the logic etc of the control system is not possible, the implications will need to be discussed with the DNO.

A flowchart illustrating this process is shown in Figure 2 below.

¹ Generators that rotate at the same speed as the mains – tend to be driven by gas or diesel engines, or by steam – but could be driven by a variety of technologies.

² Uses almost exclusively for some wind turbines, but not all wind turbines are DFIGs.

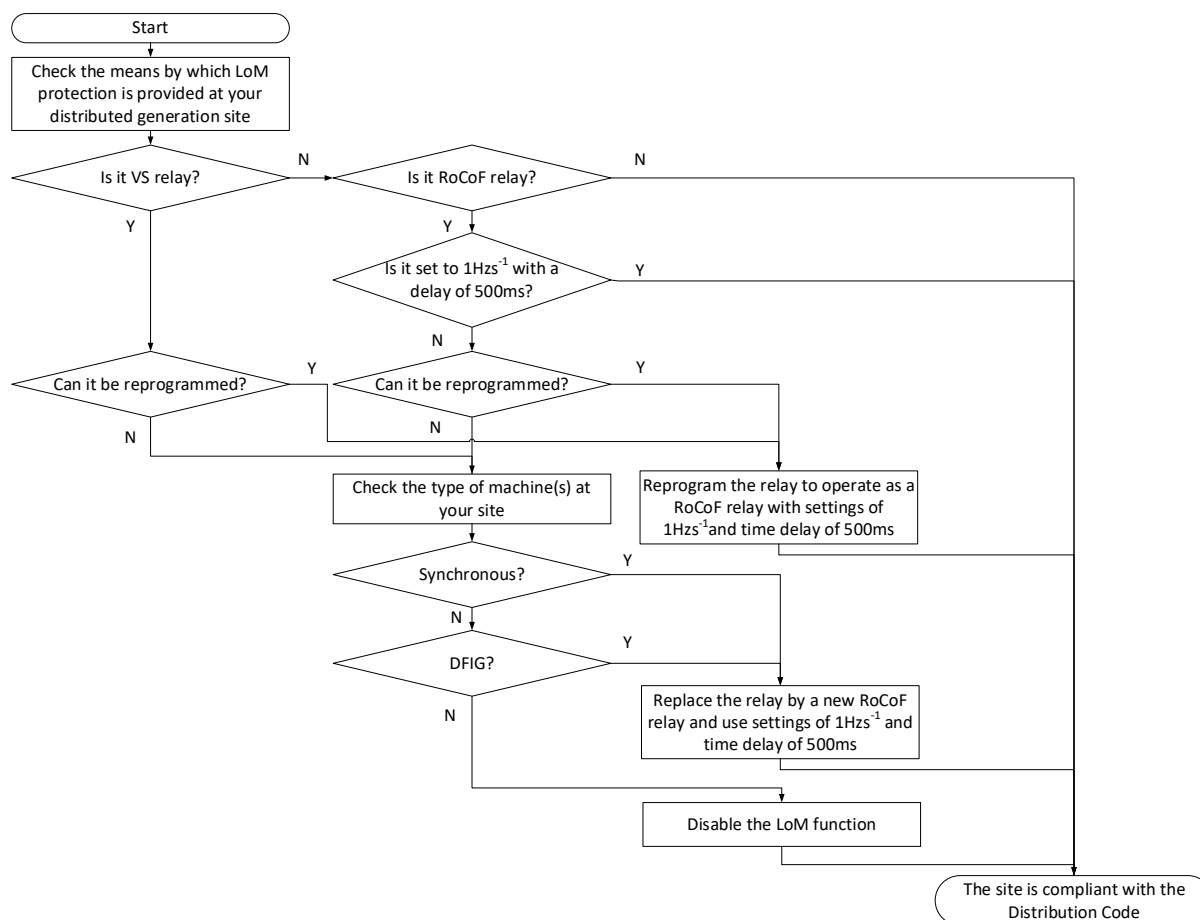


Figure 2: Identifying what needs to be done

Liaise with the DNO/IDNO

You will need to liaise with the DNO/IDNO either before or after implementing the changes. This will depend on the scope of works required at the site. As a rule of thumb, you should be able to reprogramme an existing relay or device (including converters/inverters etc) then notify the DNO/IDNO. However, if you are disabling the LoM function of an existing protection relay or device, or replacing an existing protection relay or device by a new protection relay or device, you will need the DNO/IDNO to attend to site. Please refer to your connection agreement for further details. Please note, you must also inform your DNO if you do not need to make changes because you are already compliant.

Make the changes required:

Make any changes required to achieve compliance with the Distribution Code.

WHAT YOU ARE ENCOURAGED TO DO

If you are willing to achieve compliance well ahead of the 01 September 2022 deadline, there is a Payment Scheme that would offer you a sum of money in return for this early compliance. We encourage you to apply to this scheme.

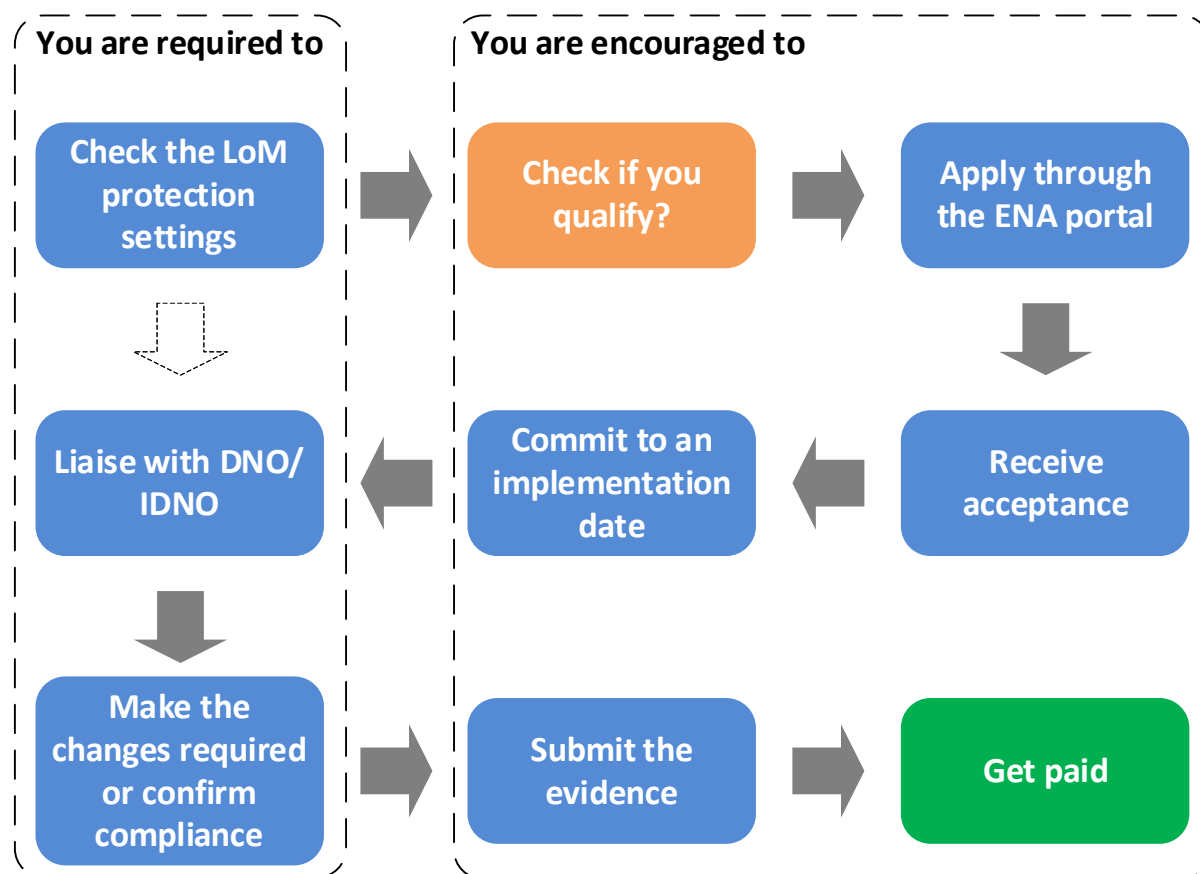


Figure 3: Support available

The pre-qualification criteria

Sites must meet the following minimum criteria to be eligible to apply for this payment:

- operate in long-term parallel mode with the distribution network,
- have been connected prior to February 2018,
- have not received any previous payment to modify their LoM protection either as a part of this Programme or any other similar programmes; and
- have their LoM protection provided by either
 - o VS relays; or
 - o RoCoF relays which have settings that are more sensitive than the settings required by the Distribution Code.

Submitting an application

If you meet the pre-qualification criteria and if you are happy to modify the protection settings ahead of the deadline specified in the distribution code, then we recommend that you submit an application for a one off payment offered by the DNO/IDNO in return for meeting the requirements ahead of the deadline. The application should indicate the lead time that you would need to implement the change once your application has been accepted.

You can submit an application at any time for as long as the scheme remains open. We advise you to do so as soon as practicable in order to maximise the opportunity that you are accepted.

Applications for Payment must be submitted via the application portal available online at: <http://www.ena-eng.org/ALoMCP>

Guidance on how to register on that portal and on how to apply are available [online](#).

Table 1: Window closure dates

Application Window	Date
Window 1	12.11.2019
Window 2	11.02.2020
Window 3	12.05.2020
Window 4	11.08.2020
Window 5	10.11.2020
Window 6	09.02.2021
Window 7	11.05.2021
Window 8	10.08.2021
Window 9	09.11.2021
Window 10	08.02.2022
Window 11	10.05.2022

You can submit the application at any time. However, applications submitted within each window are likely to be progressed together according to the timetables in the sections below.

After an application has been submitted

The DNO/IDNO to which network your site is connected will check whether your application meets the pre-qualification criteria or not and check it for consistency.

If the DNO/IDNO identifies an issue that could be resolved, they will contact you and attempt to resolve these issues. If not successful, the application will be rejected and you notified with the reasons.

Once the DNO/IDNO is satisfied with the application, it will be submitted to NGENSO for assessment. Once this happens, the application will be locked and you will not be able to change it but you could withdraw it if you choose to.

National Grid ESO will apply the assessment criteria to all the applications that have been verified by the DNO/IDNO to identify successful applications.

Each successful application will be assigned an Implementation Deadline

Applications that are not successful will be rolled forward and re-assessed in the following window

Table 2: Date by which offer is declared to have met the pre-qualification criteria or not

Application Window	Date
Window 1	26.11.2019
Window 2	25.02.2020
Window 3	26.05.2020
Window 4	26.08.2020
Window 5	25.11.2020
Window 6	24.02.2021
Window 7	26.05.2021
Window 8	25.08.2021
Window 9	26.11.2021
Window 10	23.02.2022
Window 11	25.05.2022

Table 3: Date by which the DNO receives NGENSO assessment results

Application Window	Date
Window 1	10.12.2019
Window 2	10.03.2020
Window 3	09.06.2020
Window 4	09.09.2020
Window 5	02.12.2020
Window 6	10.03.2021
Window 7	09.06.2021
Window 8	08.09.2021
Window 9	08.12.2021
Window 10	09.03.2022
Window 11	08.06.2022

Successful applicants will be notified by their DNO/IDNO that their application has been accepted and that they have to implement the protection changes required prior to the implementation deadline.

Table 4: Date by which the successful applicants will be notified of acceptance

Application Window	Date
Window 1	24.12.2019
Window 2	24.03.2020
Window 3	23.06.2020
Window 4	23.09.2020
Window 5	16.12.2020
Window 6	24.03.2021
Window 7	23.06.2021
Window 8	22.09.2021
Window 9	22.12.2021
Window 10	23.03.2022
Window 11	22.06.2022

The payment is in return of a service that you are providing to National Grid ESO through the DNO/IDNO. The service is the completion of the works by the date specified in your acceptance email. You won't be eligible for that payment until you have demonstrated successful provision of that service.

Committing to an implementation date

After you have been notified that your application has been accepted, you will have 10 working days to specify an implementation date and input it to the portal. The specification of this date will constitute your formal acceptance for the contractual terms sent to you by your DNO/IDNO.

Your chosen implementation date must allow for 20 business days in order to allow the DNO/IDNO to arrange attending to site if necessary. The DNO/IDNO may contact you to discuss arrangements and/or reschedule implementation if necessary.

On the implementation date

Make sure to familiarise yourself with the documents that you will have to submit [here](#) and the evidence you need to provide.

On the day, you or your contractor will be on site to complete the works required. Record the evidence, and fill any forms. You must submit this as soon as reasonably practicable and no later than the implementation deadline specified to you.

In addition to the changes required to the LoM protection you must confirm that you have compliant under and over frequency protection, ie with settings required in G59. If practical (ie where the protection device or other protection relay is capable) a single stage overfrequency setting of 52.0 Hz, 500 ms definite time delay should be applied. If this overfrequency setting is not possible, then the existing setting may remain. Note that some converters or inverters are supplied with internal frequency, voltage and loss of mains settings that are not compatible with G59 and these need to be changed. You will need to include this information in the information you submit.

The DNO/IDNO representative may also attend to site to witness testing (which will generally be during normal working hours).

After submission of evidence

The DNO/IDNO will review the documentation submitted to see whether these are consistent and whether they indicate that the works have been completed and the requirements have been complied with or not.

If necessary, you may be contacted to clarify some of the evidence submitted.

A percentage of sites will be subject to spot checks. If your site is one of these, the DNO/IDNO will contact you to arrange a site visit. You may need to arrange for your contractor to attend to site for that spot check.

Once satisfied that you have successfully completed the works, the DNO/IDNO will initiate the process to pay you.

Failing to complete the works

You must complete the works and submit evidence to the DNO/IDNO by the date specified in your acceptance email. Failing to do that will disqualify you for payment. In such case, you could re-apply and your application will be re-assessed. If unforeseen issues (such as pandemic precautions etc) prevent completion please discuss the implications with the DNO immediately.

The Timeline

The timeline for this process is shown in

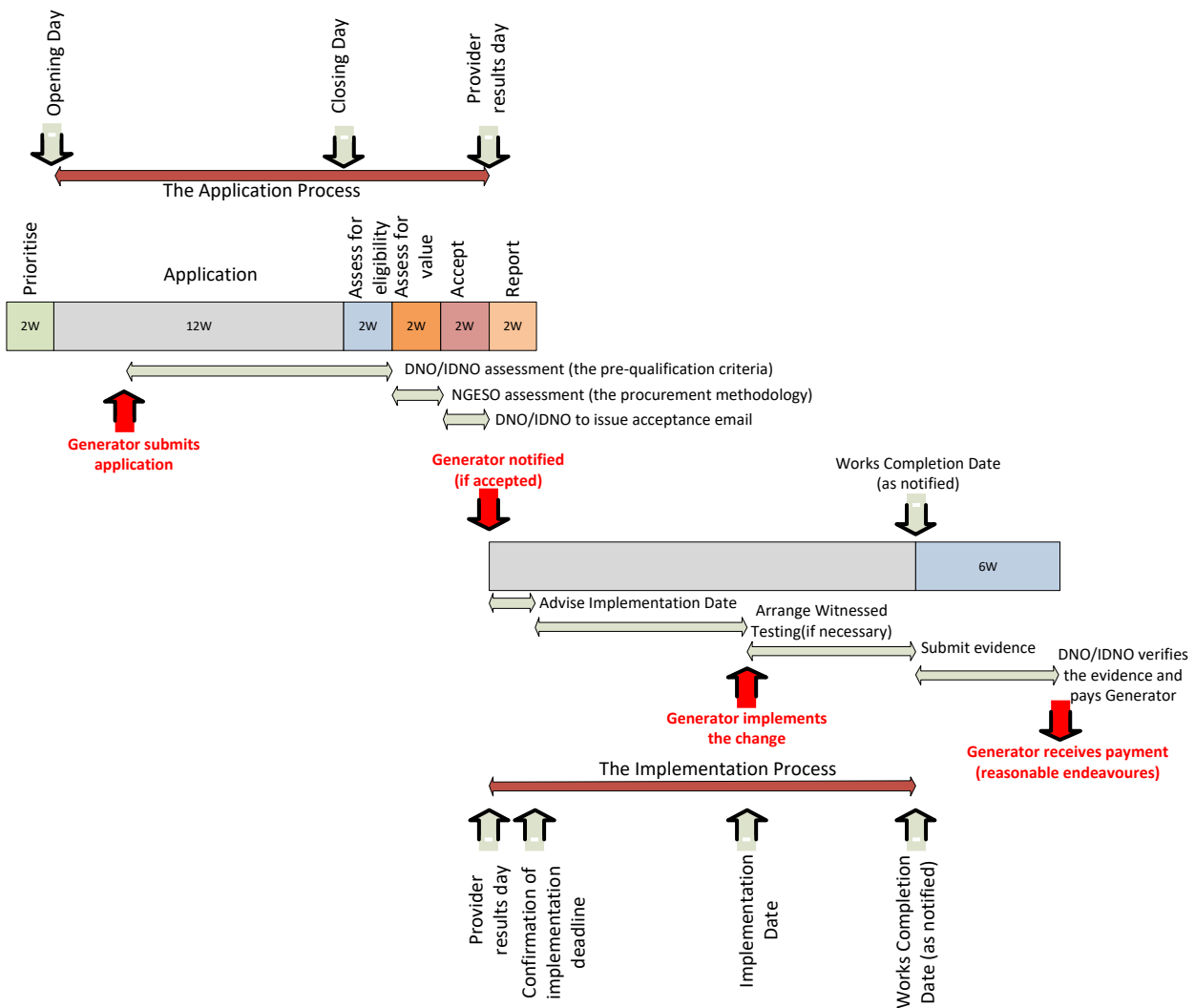


Figure 4: Process Timeline

Update History

Date	Version	Details
August 2019	1.62	Published
30 June 2021	1.71	Updated based on experience to date and to include future application window. Clarified that Programme includes all power electronic converters, not just inverters.