

Window 4 Report

Accelerated Loss of Mains Change Programme (ALoMCP)

The ALoMCP is an industry led project to accelerate compliance with the new Loss of Mains (LoM) protection requirements in the Distribution Code. It is delivered by National Grid ESO (NGESO), distribution network operators (DNOs), independent distribution network operators (IDNOs) and the Energy Networks Association (ENA). The purpose of this report is to provide a summary of the programme status following completion of the fourth application window.

Key messages

The programme is progressing well. Good engagement with potential customers means we are meeting expectations set at the beginning of the programme.

System conditions over the summer resulted in a significant increase in costs and risks associated with Loss of Mains protection. This means there is a need and an opportunity for the programme to deliver more.

The programme must be able to demonstrate that less generation would be impacted by Rate of Change of Frequency (RoCoF) than was observed during the power disruption of 9 August 2019. Not enough customer to make changes at sites with a low RoCoF setting have applied to do this yet. We are keen to see these applications or gather other evidence that has the same effect which we have not seen yet.

It would be very valuable for generator owners who have not yet engaged with the programme to apply, or to contact their DNO to confirm they do not need help from the programme. Especially larger distribution connected generators. This is because we have seen fewer applications from generators in the size range 5MW up to 50MW than in other categories, with applications covering around 40% of the available capacity so far. This contrasts with the coverage of over 70% from generators in the range 1MW up to 5MW.

Summary

- A total of 710 applications were approved in window 4, for a capacity of 1,662MW at a cost of approximately £2.6m in payments to distributed generator owners.
- This brings the cumulative total approved applications to 4,892 sites, for a capacity of 9,663MW at a cost of £17.7m in payments to distributed generation owners.
- 3,244 sites have declared completion of works at sites with a combined capacity of 6,127MW.
 DNOs have validated completion of site works for 2,231 sites (4,099MW) and 1,801 sites have now received payment¹.
- The first half of the 2020-21 year has seen changes to electricity demand due to the COVID-19 pandemic response, and low inertia on the network caused by low levels of synchronous generation output and weather conditions. These factors have resulted in a greater operational need to manage Loss of Mains risk.

¹ Progress data to 14 October 2020



- The completion of the works is reducing the sites at risk of inadvertent tripping. This reduction
 in risk is now considered when operating the system. The reduction of Vector Shift (VS) risk is
 delivering a small but growing value. The reduction of RoCoF risk is not enough to reduce
 operational costs.
- The Fast-Track scheme for sites with RoCoF settings of 0.125Hz/s and 0.2Hz/s was launched 29 June 2020. 35 sites have applied with a total capacity of 51MW, completing works within four weeks of acceptance at an additional cost to the programme of £175k.
- Window 5 opened for applications 12 August and closes on 10 November, following approval
 by the programme Steering Group. The programme delivery team has instigated an
 engagement campaign to directly contact all affected sites that have yet to apply to the
 programme by the end of 2020.

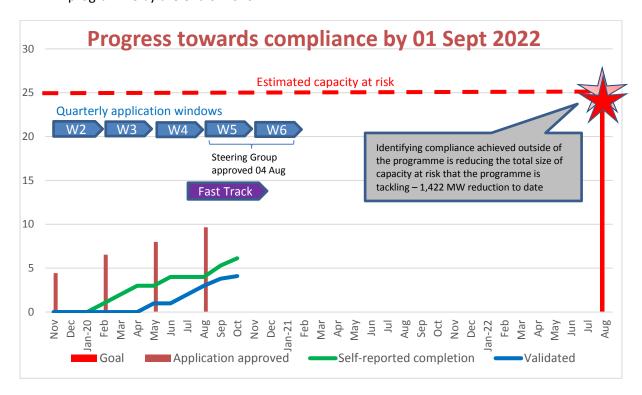


Figure 1: The progress of approved applications towards compliance by 01 September 2022 (Data at 14 October 2020)

Timeline

The schedule for window four is presented in Table 1. The portal remained open for applications after the closing day for window four. Applications received after that date will be progressed on or before the closing day for window five.

Table 1 - Key dates in window four timeline

Opening Day	13.05.2020	Distributor Results Day	08.09.2020
Closing Day	11.08.2020	Provider Results Day	22.09.2020
Pre-qualification Day	25.08.2020		



Process performance

Table 2 shows the number of applications and their assessment outcome for each completed assessment window. It provides a summary of successful applications. It shows progress made by process stage, progressing at each of the process milestones. The data indicates that:

- Applications have progressed consistently throughout the process with the 3,365 sites (6.44GW) indicating completion of works and submitting their evidence to be reviewed. Evidence has been reviewed for 2,231 sites (4.099GW) and payment made to 1,801 sites.
- Applications received continued to decline terms of site numbers. But the overall capacity increased in window 4 compared to window 3.

Table 2: Summary of applications by process stage and assessment window

Window		One	Two	Three	Four
Applications submitted to DNOs	No of applications	2,031	1,403 ²	1,011	793
by the window closing day	Total MW	5,484	3,383	2,774	2,752
Applications received by NGESO	No of applications	2,039 ³	1,306	998	775
by the pre-qualification day	Total MW	5,315	2,846	2,368	2,269
Applications approved	No of applications	1,978 ⁴	1,261	943	710
	Total MW	4,440	2,105	1,457	1,662
Sites accepting contractual	No of applications	1,786	1,065	898	427
terms	Total MW	4,174	1,904	1,239	792
Sites self-reporting completion	No of applications	1,731	772	796	66
	Total MW	4,104	1,281	907	150
Evidence of completion verified	No of applications	1,306	483	431	11
by DNO / iDNO	Total MW	2,915	776	341	66
Sites paid	No of applications	1,084	389	326	2
	Total MW	2,162	503	135	64

There has been no change to the assessment criteria since February 2020. Window 4 assessment led to 65 applications being rejected. Some applications did not progress through the application process due to inconsistencies, ambiguities or errors. DNOs/IDNOs are speaking with applicants to have these issues rectified prior to the window 5 closing day. Other applications did not progress due to their ineligibility to participate or because their protection settings are not currently compliant with existing requirements. Approved applications in this assessment window were given a deadline of no later than the end of March 2021 to complete the works.

DNOs/IDNOs have been remotely witnessing testing and conducting sample site visits with 217 site changes witnessed to date. This is to minimise travel and face to face interactions in line with the government guidelines.

The delivery assurance activities are tailored to provide some insight on how the changes required are being implemented. So far, no major issues have been identified. Some minor issues were identified

² Includes some applications not approved in window 1

³ Some DNOs/IDNOs had enough capacity to process applications received between the window closing day and the pre-qualification day

⁴ 45 sites, with a combined capacity of 88MW were given conditional offers in window 1 and have been added to this table. In the window 1 report these 45 sites appeared as a foot note, rather in the Table 2 figures.



by DNOs when validating the evidence provided by customers. All sample site visits reported by DNOs/IDNOs have been satisfactory. Some payments were withheld until the minor issues identified are rectified.

Value delivery

Table 4 shows the estimate of the total generation capacity that require a change in their protection settings through the ALOMCP.

The initial estimate was informed by the standard planning data provided by DNOs (known as week 24 submissions) under the Grid Code, and some significant assumptions to cover for the uncertainty associated with legacy sites.

The revised estimate considered the data provided through applications and the knowledge gained through engagement with sites that require no change to their LoM protection through the programme. This resulted in:

- a reduction in the difference between the high estimate and the low estimate for the total risk as well as each of the two risk components, and
- a reduction in the high estimate for each of the two risk components.

The figures will be reviewed as more knowledge is gained.

Table 4: Estimates of total generation capacity at risk of tripping due to inadvertent operation of LoM

		Original	Revised
		programme	estimates
		estimates	(08 Oct '20)
High estimate	Total (GW)	24	24
	VS component (GW)	22	21
	RoCoF component (GW)	2	3
Low estimate	Total (GW)	20	22
	VS component (GW)	10	14.5
	RoCoF component (GW)	10	7.5



Table 5 shows how the volume at risk of disconnection due to RoCoF and VS protection will reduce as the sites with applications approved through each window implement the changes required.

Table 5: Projected RoCoF and VS risk reduction⁵

wo							
Window			Dec 19 -	Mar -	Jun -	Sep -	Dec 20 -
≯	Delivery Milestone	Dec 19	Mar 20	Jun 20	Sep 20	Dec 20	Mar 21
ST VS	Projected RoCoF risk reduction (MW)	N/A	207.4	158.7	68.4	19.8	64.2
Previous windows	Projected VS risk reduction (MW)	N/A	1,761.3	2,758.8	1,319.7	313.0	965.8
Prewin	Projected total risk reduction (MW)	N/A	1,968.7	2,916.5	1,388.2	332.8	1,030.1
	Projected RoCoF risk reduction (MW)	N/A	N/A	N/A	N/A	139.1	0
<u>_</u>	Projected VS risk reduction (MW)	N/A	N/A	N/A	N/A	1,307.1	93.9
Four	Projected total risk reduction (MW)	N/A	N/A	N/A	N/A	1,446.1	93.9
_	Projected RoCoF risk reduction (MW)	N/A	207.4	158.7	68.4	158.9	64.2
Overall	Projected VS risk reduction (MW)	N/A	1,761.3	2,758.8	1,319.7	1,620.1	1,059.7
õ	Projected total risk reduction (MW)	N/A	1,968.7	2,916.5	1,388.2	1,778.9	1,124.0

The changes that the programme is making to Loss of Mains protection for VS are expected to significantly reduce the occasions when NGESO needs to take an action to increase system inertia. This ensures that the loss of generation due to the operation of VS protection alone does not trigger further generation loss due to RoCoF relays.

For RoCoF risks, neither the projected short-term reduction in RoCoF risk following the completion of works at all sites approved in windows 1, 2, 3 and 4 nor the currently assumed reduction in that risk are yet sufficient to influence the actions the NGESO Control Room takes to manage the risk.

The targeted long-term reduction in RoCoF risk is intended to eliminate the need to take actions to ensure that RoCoF relays are not inadvertently activated. The overall opportunity for savings is over £170m per annum through a combination of further VS changes and the completion of RoCoF changes.

This evaluation of benefit is based on the historic cost of balancing actions to address the Loss of Mains issue, which was £144m in 2018-19 and £201m in 2019-20. In the first six months of 2020-21 the cost of managing Loss of Mains risk totaled £208m.

The first half of the 2020-21 year has seen changes to electricity demand due to the COVID-19 pandemic response, and low inertia on the network caused by low levels of synchronous generation output and weather conditions. These factors have resulted in a greater operational need to manage Loss of Mains risk. We expect higher costs in the future, in the absence of the programme, as the contribution from traditional synchronous forms of generation of electricity production decreases. This means we are likely to increase the estimated benefits from the programme once we have reviewed this summer's costs. It also means that that the need for urgency in completing the programme has increased to tackle the rising costs as soon as possible.

⁵ Not considering any extension granted in response to COVID 19 pandemic



The forecast cost of the programme is £100m, which will be charged through BSUoS over the relevant timeframe. The cost is included within our BSUoS forecasts alongside the cost of the balancing actions which are expected to be taken to manage this issue before it is resolved. Once the programme is complete, the commercial cost of managing the issue will be removed.

With many sites indicating completion of the works and progressing through the delivery assurance process, NGESO is modelling the risk reduction delivered by the programme when securing the system in operational timescales. The assumed risk reduction values are shown in Table 6. These values will continue to increase as more sites indicate completion of the works and as the delivery assurance activities progress.

Table 6: Assumed RoCoF and VS risk reduction

Delivery Milestone	July 20	Sept 20
RoCoF risk reduction (MW)	82	124
VS risk reduction (MW)	1,847	3,789

The Programme team is continuing to identify sites that have LoM protection and are compliant with G59/3 issue 7, and do not need to apply to the Programme. Since the window 3 report was published in July 2020, an additional 1GW of pre-existing compliance achieved outside of the programme has been identified (Table 7).

Table 7: Compliance achieved outside of the programme

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	Pre-existing compliance – cumulative					
	July 2020	October 2020				
Sites identified	34	97				
MW	450	1,422				

Identifying compliance outside of the programme and ALOMCP delivery is reducing the number of generation sites with remaining capacity at Loss of Mains risk to apply ahead of the compliance deadline of 01 September 2022, as illustrated previously in Figure 1.



Cost reporting

The projections of site-related costs are shown in Table 8. These projections cover the costs associated with the implementation of site changes (based on the data provided in the applications) and estimates of the costs required to cover delivery assurance activities. The table forecasts timely completion of the works, completion of delivery assurance activities, and payment.

Table 8: Projections of site-related costs⁶

	Up to	Dec -	Mar -	Jun -	Sept -	Dec -	Mar -
Delivery stage	Dec 19	Mar 20	Jun 20	Sept 20	Dec 20	Mar 21	Jun 21 ⁷
No of sites completed		1,066	1,298	1,272	930	281	
No of sites witnessed		150	95	17	75	23	
No of sites sampled		0	183	241	251	171	52
No of sites self-certified		733	962	1004	684	206	
Provider payment (£m)		3.72	5.234	4.343	3.509	1.101	0.026
DNO cost (£m)		0.15	0.222	0.2064	0.2608	.1552	0.0416
Total site related cost (£m)		3.87	5.456	4.5494	3.7698	1.2562	0.0676

The actual numbers of sites declaring completion, witnessed, sampled, and self-certified are given in Table 9.

Table 9: Actual costs and progress to date

		Dec -	Mar -	Jun -	Total cost
Delivery stage	Dec 19	Mar 20	Jun 20	Sep 20	(£m)
No of sites completed		1,102	643	444	
No of sites witnessed		108	21	88	
No of sites sampled		0	85	109	
No of sites self-certified		548	282	2,391	
Provider payments (£m)	0	0	1.592	1.772	3.364
DNO costs (£m)	0	0	0.052	0.082	0.134
Total site related costs (£m)	0	0	1.644	1.854	3.497
DNO administration costs	0.040	0.104	0.421	0.564	1.130
DNO costs being processed					
(not yet categorised)	0	0	0	1.624	1.624
TOTAL by Quarter (£m)	0.040	0.104	2.065	4.040	
TOTAL cumulative (£m)	0.040	0.145	2.209	6.251	6.251

Site delivery between March 2020 and September 2020 dropped below the original forecast. This is likely to be due to COVID-19 restrictions and the subsequent extension to the site works completion deadlines. Most of the providers used recognised contractors to undertake the site works. Therefore, the number of sites where DNOs undertook witness testing of the LoM protection following the completion of the works is below the initial estimates. The actual progress reflects the time required

⁶ Site-related costs are forecast according to when applicants originally committed to complete the works. It should be noted that actual costs may be delayed both by the difficulties arising from the coronavirus pandemic and the time taken to complete delivery assurance activities and payment process.

⁷ All applications approved to date have a Latest Valid Completion Date of no later than 23 March 2021.



to process the application through each stage. We expect the numbers to continue to track behind the original projections.

Total invoiced costs to the end of September totaled £6.25m. This is comprised of £3.36m in payments to providers that have implemented changes at their sites, £0.13m for witness testing and site visits and £1.13m in DNO programme administration and delivery costs. A further £1.62m in invoices are being categorised by NGESO into these three types of cost.

Fast Track Scheme

On Monday 29 June 2020, the Programme published the details of Fast Track Scheme 1. This scheme aims to incentivise sites of capacity from 500kW to <5,000kW and with sensitive RoCoF protection (up to and including 0.2Hz/s) to complete the protection changes within four weeks of acceptance by the programme. Sites meeting these criteria are eligible for an additional £5,000 payment.

35 sites have been approved through the Fast-Track scheme and have reported completion of works with a combined capacity of 51.41MW at an additional cost of £175k to the programme. The Steering Group has agreed to extend the Fast-Track scheme throughout application window 5.

Communication and engagement

Feedback from window 3 applicants in the customer survey indicated that most customers' (who responded) preference was to find out about the programme directly from their DNO. This reinforced the importance that the programme team has given to direct engagement. DNOs lead this activity through their customer support teams to raise awareness of sites connected to their networks and to encourage their participation in the programme.

In parallel, NGESO reached out to trade bodies and associations to highlight the programme at a national level. The following trade bodies and stakeholders published updates in their newsletters or magazines to help promote the project:

- British Hydro Association's Summer 'Spotlight' Magazine
- Cornwall Insight's daily newsletter
- Energy UK's weekly member's newsletter
- Solar Trade Association's member's newsletter
- The AMPs Association shared an update on their website in August.
- The Energy and Utilities Alliance (EUA) members' newsletter in July.
- The ADE shared an update with their members in July

Licensees across the programme have used social media (LinkedIn and Twitter) to share updates on application windows, deadlines and links to apply. The stakeholder workstream manage an activity tracker to capture activity across all regions. This ensures we were aware of communication activity across Great Britain and avoid duplication. This meant we could pin-point where there were gaps in our communication so we could make as many suitable customers as possible aware of the programme's existence, and the criteria for applying.

ESO has engaged with internal teams who have initiatives that include frequency response audiences, which the programme is keen to target. Updates have been included in the NGESO's Power Responsive newsletters and Optional Downward Flexibility Management newsletters. We continue to speak with



these teams to keep sharing updates and making new generation site owners aware using these channels when we can.

DNOs have engaged with other customer-facing teams to identify affected sites and to get owners to apply. DNOs have also adopted a range of communication measures including customer forums, website updates and targeting of particular customer sectors. For example, engagement through an existing customer forum led Northern Powergrid to establish a programme-specific stakeholder forum:

In November 2019, the Programme was highlighted at a DG Owner Operator Forum hosted by Northern Power Grid (NPg). There was a lot of interest in the ALOMCP and stakeholders were keen to have a specific platform to discuss the process. Therefore, a new Programme Forum was created and the first meeting convened online in July with 10 stakeholders.

As well as providing a means to collate and report detailed feedback and issues from stakeholders familiar with the project directly, it helped NPg capture from the contractors and other key areas (trade associations, business groups etc) where they felt targeted engagement would be beneficial, at both a national and a local level. This forum provides good insight / feedback which is shared with the Stakeholder Workstream members to enhance communication activity.

Further examples of communications activity are illustrated in Appendix 1.

Focus Areas

NGESO and Scottish DNOs are currently finalising details which allow eligible, embedded large power stations in Scotland to participate in the programme. This will address an additional capacity of 2GW that was not in the original scope.

Activity is underway to identify and directly engage all sites with export MPAN (Meter Point Administration Number) during autumn 2020 and encourage them to participate in the programme as soon as possible. This is a significant undertaking for each DNO and in total will require contact with several thousand sites. This will be followed with a similar exercise for sites with import-only MPANs. The outcome of this activity will inform what further action is required within the programme to achieve compliance.

This engagement activity also seeks to identify additional sites with low RoCoF settings (up to 0.2 Hz/second) and encourage their prompt participation in the programme, with the ongoing incentive of an additional £5,000 payment if they both meet the criteria and can complete their changes within four weeks of being accepted by the programme.

The programme team continue to identify sites that have achieved compliance outside of the programme. This is for the updating the system operational data on the scale of outstanding Loss of Mains risk to be managed, and to reduce the scale of outstanding sites that need to make the take action.

Communications activities are increasing, with a strategy being implemented across four key themes:

Nationwide activity – to raise awareness, programme legitimacy and ease of access



- Sectoral targeted at specific generation types and ownership groups
- Local engagement through DNOs directly to their customers and through customer forums
- Suppliers engaging suppliers to harness their existing relationships with sites

This communications activity will be supplemented by a programme of notifying all sites of the impending compliance deadline of 01 September 2022 and implementing a rolling phase of reminders as this deadline draws closer.

We continue to speak to inverter manufacturers to establish if their products provide LoM protection functionality or not, the type of this protection (if it exists) and how their equipment would need to be reprogrammed to meet the new requirements. Seventeen out of twenty-six manufacturers approached have provided full or partial guidance on these issues. We are also engaging with manufacturers we have identified have products with other forms of protection, e.g. under frequency protection that could cause unnecessary tripping of generation.

Window 5

Applications can be submitted for assessment in window 5 via the online portal (http://www.ena-eng.org/ALoMCP). Window 5 closing day is planned for 10 November 2020.

During window 5 the programme's Steering Group approved the continuation of the Fast-Track incentive or early delivery of priority sites. This will run alongside the general window 5 application process.

Published November 2020

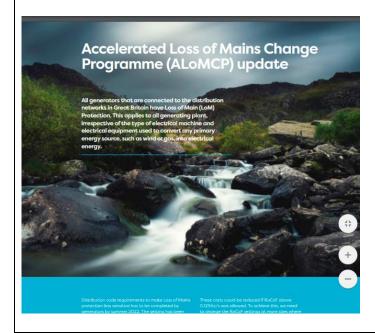


Appendix

Communication Activity Examples Appendix

Trade Bodies / Association's updates

British Hydro Association's Magazine 'Spotlight':



Renewable Energy UK – letter to members

The Accelerated Loss of Mains Change Programme (ALoMCP) is a project led by National Grid Electricity System Operator (ESO), Distribution Network Operators (DNOs) and Independent Distribution Network Operators (IDNOs). The objective of the project is to accelerate compliance with new requirements in the Distribution Code EREC G59. Owners of generation sites must make these changes by 31 August 2022.

Since the ALoMCP launched in September 2019, 7,914MW of capacity has been updated by 30 June 2020 to meet the new code requirements. In light of covid-19 a Fast Track Process has been introduced to help address the increased LoM system risks from the reduction in electricity demand.

The Fast Track Process offers an additional payment of £5k to embedded generation such as distribution connected onshore wind to commit to make the changes required to the LoM protection settings. Please note that the ALoMCP does not apply to domestic and similar generation connected under EREC G83 and only applies to generation connected before 1 February 2018 in accordance with EREC G59 and which meets the following requirements:

- Minimum site capacity: 500kW
- Maximum site capacity: 5,000kW
- Type of LoM protection: RoCoF
 Pre-change RoCoF settings: up to and including 0.2 Hz/s
- Lead time to completing the changes: less than or equal to 4 weeks

All generation sites which meet the specified criteria and apply on the following registration portal could be reimbursed for the work they will have to do in order to comply with the new LoM requirements. The Fast Track process will run in 'schemes', each with its own qualifying criteria, cap and additional payment. For more information, please read the Paym ecification or contact your DNO/IDNO. We encourage all members which meet the specified criteria to apply on the following registration portal

Kind regards, Yonna

Solar Trade Association newsletter snippet:

Accelerated Loss of Mains Change Programme

The Accelerated Loss of Mains Change Programme (ALoMCP) recently launched a fasttrack scheme, through which generation sites can access an additional £5K with the

- . Site Registered Capacity: minimum 500 kW but less than 5MW
- . Type of LoM protection: RoCoF
- · Pre-change RoCoF settings: Up to and including 0.2Hz/s
- Lead time: Less than or equal to 4 weeks

The ALoMCP is a project led by NGESO, DNOs and IDNOs. The objective of the project is to accelerate compliance with new requirements in the Distribution Code EREC G59. Owners of generation sites must make these changes by 31 August 2022. After this date, owners who have not made the changes may be the subject of an enforcement programme. More information about the programme can be found

Find out more

ena nationalgridESO

Cornwall Insight Newsletter snippet:

Loss of Mains in Cornwall daily newsletter

ESO reminds generation owners to comply with code changes

National Grid Electricity System Operator (ESO) has reminded generation site owners that they have until 31 Augus 2022 to become compliant with Distribution Code EREC G59. The note concerns the Accelerated Loss of Mains Change Programme (ALoMCP). The objective of the project is to accelerate compliance with new requirements. After 31 August 2022, owners who have not made the changes may be the subject of an enforcement programme. Owner of sites who make the settings changes in the ALOMCP will be paid by the DNOs/IDNOs they are connected to. Payment is made based on the degree of work involved. This programme does not apply to domestic and similar generation that has been connected under EREC G83. It only applies to generation connected before 01 February 2018 in accordance with EREC G59. For more information, interested parties are recommended to get in touch with their DNO or visit the ENA Loss of Mains website.

Energy UK newsletter



Accelerated Loss of Mains Change Programme

On 29 June, the Accelerated Loss of Mains Change Programme (ALoMCP) launched a fast-track application process offering an additional payment of £5,000 to distributed generation sites that

meet specific qualifying criteria and can commit to making required loss of mains protection changes quickly. This aims to help address the increased loss of mains risk and costs resulting from the change in electricity demand from the lockdown. More information on the Change Programme, its different schemes and the application method can be found here Please contact your DNO or INDO for more information – their contact details can be found here

Examples of DNO communications and engagement activities

ENW – website tracker of progress

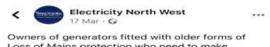


ENW - extract from internal newsletter to engage other customer-facing teams

The Accelerated Loss of Mains Change Programme needs your help



The Accelerated Loss of Mains Change Programme (ALoMCP) is a national initiative established to modify historical loss of mains protection settings on generators to address network stability concerns in line with recent updates to the Distribution Code (DC0079). The programme allows generator owners to apply for funding to make the necessary changes to their protection settings.



Loss of Mains protection who need to make changes are encouraged to make an application for financial support before the current window closes on May 12th. https://t.co/wrulee2XGM https://t.co/ eZOIc4NWSE

#LoM #ALoMCP #Generators

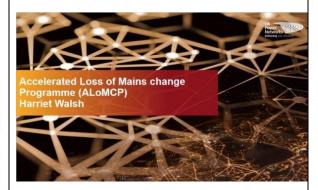








UKPN DER Forum presentation



SSEN Video introducing Fast Track

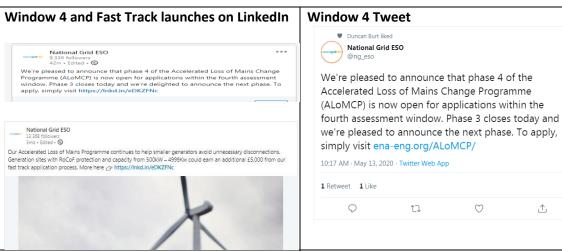


SPEN LinkedIn coverage









August 5th 2020

National Grid ESO @ng_eso

There's still time for generation site owners to apply for

funding to make #LossofMains protection settings in the ALOMCP before Window 4 closes on 11 August. Our Fast

Track application process remains open for generation site owners who meet the criteria bit.ly/3ijJLv6



