Data Communications Company

Power Outage & Restoration Alerts Delivery Management Document

Purpose

This document is the Power Outage & Restoration Alerts Delivery Management Document as referenced in SEC Section H3.14-H3.15.

SEC Section H3.14B requires the agreed methodology set out in this document to be reviewed at least annually to set the Target Response Times (TRTs) and any other metric that measures the performance of Power Outage Alerts (POA), specifically AD1 Alerts and Power Restoration Alerts (PRA), specifically 8F35 and 8F36 Alerts for SMETS2+ meters and where appropriate, to review this methodology.

GBCS Event and Alert Codes

Event / Alert Code	Event / Alert Code Meaning
0x8F35	Supply Outage Restored
0x8F36	Supply Outage Restored - Outage >= 3 minutes

The current version of this document excludes polyphase meters. TRTs for this meter type will be included in the next review of this document.

This document provides clarity and transparency of the methodology and to alleviate the requirement to raise a SEC Modification annually to revise the relevant performance TRTs, exclusions, methodology and reporting.

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Revision History Document Control

Revision Date	Summary of Changes	Changes Marked	Version Number
19/07	Changes made following MRC	Yes	V0.16
19/07	Renamed version following approval of MRC Feedback	No	V1.0

Approval Requested

Version	Forum	Issue Date	Approval Date
Current			
Prior Approval			

These tables will be updated as versions are approved

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1 Methodology for Setting Performance Targets

The following section presents the methodology used to determine the performance of POAs, specifically AD1 Alerts and PRAs, specifically 8F35 and 8F36 Alerts for SMETS2+ single phase meters.

The methodology will be reviewed at least annually, which may result in revision and/or addition of further TRTs or any other metric that measures the performance of the AD1 Alerts and/or the 8F35/8F36 Alerts and/or their exclusions. Outage related Alerts for polyphase meters are not included in version 1.0 of this document. DCC will propose performance TRTs and a methodology for polyphase meters in the next version of this document produced as part of the next annual review.

The performance metrics have been separated out by WAN technology, specifically:

- 1.1 Predominantly second or third generation cellular technology; and
- 1.2 Predominantly long-range radio technology.

This is due to the differences in system constraints between these technologies affecting performance. Further details of current system capability and constraints can be found in MP096 Power Outage Alert & Power Restoration Alert Technical & Enhancement Paper v5.0, which can be located on the SECAS Website, (https://smartenergycodecompany.co.uk/modifications/dno-power-outage-alerts/) Select ‘Modification Documents’ then ‘MP096 DCC Technical Study Paper.’

1.1 Methodology for Second or Third Generation Cellular Technology

The following methodology, set out in Section 1.1.1 and Section 1.1.2, has been used to set the TRT for POAs, specifically AD1 Alerts and PRAs, specifically 8F35 and 8F36 Alerts received from SMETS2+ single phase electricity meters and communication hubs (CHs) connected via second or third generation cellular technology network.

The TRTs for the AD1, 8F35 and 8F36 Alerts as set out in version 1.0 of this document are likely to remain the same, as increased volume of installed and commissioned CHs and ESMEs will not impact the performance of second or third generation cellular technology network. The target TRTs set in the first year should be validated each year but are unlikely to need changing. This has been captured in Assumptions – Section 1.1.3, Table 1, ID#A1.

1.1.1 Power Outage Alerts – AD1 Alerts

The TRT for AD1 Alerts, generated by a CSP system predominantly deploying second or third generation cellular technology, is based upon:

- The upper performance limit time achieved over the previous 12 months to deliver 95% of all AD1 Alerts.

Table A-1 of Appendix A includes actual data for AD1 Alerts which has been used to set the TRT included in Section 2.1, for a CSP system predominantly based upon a system deploying second or third generation cellular technology.

1.1.2 Power Restoration Alerts – 8F35/8F36 Alerts

The performance TRTs for 8F35/8F36 Alerts, generated by an ESME and transmitted via a CSP operating a system predominantly deploying second or third generation cellular technology, is based upon:

- The system constraint associated with the re-connection of the CH following a power restoration, which can take up to one minute 30 seconds; and

Hence the TRT to deliver 95% of 8F35/8F36 Alerts shall be set at one minute 30 seconds.

(Reference to the re-connection time can be found in Section 4.2, Power Outage Alert & Power Restoration Alert Technical & Enhancement Paper v5.0 - which can be located on the SECAS Website, (https://smartenergycodecompany.co.uk/modifications/dno-power-outage-alerts/) Select ‘Modification Documents’ then ‘MP096 DCC Technical Study Paper.’

Table A-2 of Appendix A includes data for 8F35/8F36 Alerts, which has been used to set the TRT, for a CSP system based upon a system predominantly deploying second or third generation cellular technology.

1.1.3 Assumptions

The following table presents the key assumptions made when setting the TRTs for AD1, 8F35 and 8F36 Alerts for the next 12 months for a CSP system predominantly deploying second or third generation cellular technology.

Table 1. Assumptions for second or third generation cellular technology

ID	Assumption	Description
A1	Changes in performance of AD1, 8F35 and 8F36 Alerts delivery is not impacted by increases in number of commissioned CHs and Electric Smart Meter Equipment (ESME)	Performance will be sustained at current level through to full network capacity being reached
A2	No DCC network changes/capacity increases are planned over next 12 months that will impact performance of second or third generation cellular technology network	Performance will be sustained at the current level

Annual reviews shall use data covering the previous 12-month period to validate the performance TRTs, which are not expected to change.

1.2 Methodology for Long-Range Radio Technology

The following methodology set out in Section 1.2.1 and Section 1.2.2. is applicable to AD1, 8F35 and 8F36 Alerts received from SMETS2+ single phase electricity meters and CHs connected via long-range radio technology network.

There are two TRTs for AD1 Alerts, one set out in Section 1.2.1, the other set out in Section 1.2.2.

Unlike second or third generation cellular technology, the TRT performance of AD1/8F35/8F36 Alerts delivered using long-range radio technology will likely be impacted by the increase in volumes of installed and commissioned CHs and ESMEs. It is difficult to predict how the performance will be affected in the future, therefore the target performance TRTs have been established using a simple linear extrapolation which will need to be reviewed on an annual basis. This should be based on actual data with consideration of events over the previous 12 months and improvements of CSP capability expected over the following 12-month period.

1.2.1 Power Outage Alerts – AD1 Alerts (Time to Deliver 95%)

The first TRT for AD1 Alerts, generated by a CSP system predominantly deploying long-range radio technology, is based upon:

- The time taken over the last 12 months to deliver 95% of all AD1 Alerts extrapolated over the next 12-month period.

Table B-1 of Appendix B includes actual data which has been plotted in Graph B-1 and the graph showing the extrapolated data for AD1 Alerts which has been used to set the TRT included in Section 2.2, for a CSP system predominantly deploying long-range radio technology.

1.2.2 Percentage of AD1 Alerts Delivered within 1st Delivery Window

Long-range radio technology system sends AD1 Alerts from the end of the third minute of a power outage in three different time windows. Within each time window, the actual time of alert transmission is randomised to minimise the risk of collision.

The second performance metric for AD1 Alerts is measured from the end of the third minute of a power outage, generated within the first window of 45 seconds and is based upon:

- the number of AD1 Alerts sent by the 225th second (three minutes 45 seconds), reported as a percentage of all AD1 alerts received each month for 12 months, averaged over that 12-month period.

Graph B-3 of Appendix B shows the consolidated graph that illustrates for April 2022 the target percentage as proposed in Section 2.2.

1.2.3 Power Restoration Alerts – 8F35/8F36 Alerts

The TRTs for 8F35/8F36 Alerts, generated by an ESME and transmitted via a CSP system predominantly deploying long-range radio technology, is based upon:

- The system constraints associated with connection of the CH after a power restoration and the subsequent request for an uplink slot. This is limited to one alert per channel per second which will take up to eight minutes at full capacity.

Table B-2 Appendix B includes data for 8F35/8F36 Alerts, which has been used to set the TRTs included in Section 2.2, for a CSP system predominantly deploying long-range radio technology.

1.2.4 Assumptions

The following table presents the key assumptions underpinning the TRTs for AD1, 8F35 and 8F36 Alerts for a system predominantly deploying long-range radio technology:

Table 2. Assumptions for Long-range Radio Technology

ID	Assumption	Description
A4	Reduction in performance of AD1 Alerts is expected as the number of commissioned CHs increases A linear relationship has been assumed and the graphical evidence is included in Graph B1 of Appendix B	Performance is expected to reduce over the subsequent 12 months as traffic volumes increase across the long-range radio network– causing increased congestion which may impact TRTs for AD1 Alerts
A5	Performance is expected to reduce when there is an extremely high volume of traffic attempting to be received by a single mast	There will be more collisions in higher density areas which will prevent the AD1 and/or 8F35 and/or 8F36 Alerts from being sent within the TRTs
A6	Steady installation rate across the next 12 months based upon average of last year	Due to the relationship between performance and number of connected devices, any large increases in installation rates will negatively impact the performance of alerts delivered within the target times
A7	There will be improvements to long-range radio technology over 2022	Additional Alert channels are to be installed on highly utilised masts which will improve performance of 8F35 and 8F36 Alerts. These additional channels will have no impact on AD1 Alerts because they do not travel in the same way

2 Performance Metrics

The following performance measures relate to the the capacity of the CSP system to deliver AD1, 8F35 and 8F36 Alerts, from the CHs in situ at a property that is subject to a power outage and its subsequent power restoration event, to the DNO, and in relation to AD1 Alerts, the Supplier, within defined times.

The TRTs relate to AD1, 8F35 and 8F36 Alerts received from single phase SMETS2+devices only.

2.1 Performance for Second or Third Generation Cellular Technology

Table 3 sets out the TRTs for AD1, 8F35 and 8F36 Alerts for a CSP system operating predominantly second or third generation cellular technology.

The performance of the AD1, 8F35 and 8F36 Alerts is unlikely to vary significantly from current levels as increased volume of installed and commissioned Communications Hubs and ESMEs will not impact the performance of second or third generation cellular technology network. The targets set in the first year should be validated each year but are unlikely to need changing. This has been captured in Assumptions – Section 1.1.3, Table 1, ID#A1 .

Table 3. Performance TRTs for second or third generation cellular technology

Alerts Type	95th Centile Performance	Measure
AD1 Alert	**5 minutes 11 seconds** **(Jan 2022, Table A-1 Appendix A)** TRT is measured from the end of the third minute of the power outage	AD1 Alert TRT has been selected from the upper time limit demonstrating normal system behaviour The Target represents normal system behaviour up to which the CSP can offer no remedy to improve upon this TRT
8F35/8F36 Alert	**1 minute 30 seconds** **(Nov 2021, Table A2, Appendix A)** Measured from restoration time recorded by the ESME	8F35/8F36 Alert TRT is based upon system constraints associated with the upper time limit demonstrating normal system behaviour for the reconnection of the CH following a power outage, of up to one minute 30 seconds This represents normal system behaviour up to which the CSP can offer no remedy to improve upon this TRT

Please see Tables A-1 and A-2 in Appendix A and the graphs A-1 and A-2 which show the relatively static nature of the AD1, 8F35 and 8F36 Alerts over the last 12 months.

2.2 Performance for Long-Range Radio Technology

Table 4 sets out the TRTs for AD1, 8F35 and 8F36 Alerts for a system operating predominantly long-range radio technology.

Unlike second or third generation cellular technology, the TRT performance of AD1/8F35/8F36 Alerts delivered using long-range radio technology will be impacted by the increase in volumes of installed and commissioned Communications Hubs and ESMEs. It is difficult to predict how the performance will be affected in the future, therefore the target performance TRT has been established using a simple linear extrapolation which will need to be reviewed on an annual basis. This should be based on actual data with consideration of events over the previous 12 months and improvements of CSP capability over the following 12-month period.

The following targets represent normal system behaviour up to which the CSP can offer no remedy to improve upon these TRTs:

Table 4. Performance TRTs for Long-Range Radio Technology

Alerts Type	95 Percentile Performance	Measure
AD1 Alert	**4 minutes 5 seconds** (see Graph B-2 in Appendix B) TRT is measured from the end of the third minute of the power outage	AD1 Alert TRT is calculated by extrapolating the linear trendline for the last 12 months of data over a further 12-month period Extrapolation of the linear trendline is predicated on Assumptions – Section 1.2.4, Table 3, ID# A4-A6
8F35/8F36 Alert	**5 minutes 34 seconds** (Ref Jan 2022, Table B2, Appendix B)	8F35 and/or 8F36 Alert TRT is predicated upon the system constraint associated with the reconnection of the CH following a power outage, which can take up to 8 minutes Upper time limit over last 12 months demonstrating normal system behaviour

Due to the distribution of AD1 Alerts delivered by a system predominantly deploying long-range radio technology, a second performance target has been set for the volume of AD1 Alerts, measured from the end of the third minute of the power outage, that are sent within the first 45 second window.

Table 5. Target Percentage of AD1 Alerts delivered in first 45 seconds

Alerts Type	% of Alerts sent in 1st window	Measure
AD1 Alert	**88%**	This target has been set using the number of AD1 Alerts sent by the 225th second (three minutes 45seconds), reported as a percentage of all AD1 alerts received each month for 12 months, averaged over that 12-month period

The Graph B-3 in Appendix B shows the distribution of AD1 Alerts received over a period of time verses SLA.

3 Exclusions

The exclusions in this section are related to the performance of current systems and do not take into consideration polyphase meters.

The following table presents several issues that negatively impact the delivery of AD1 Alerts and/or 8F35 and/or 8F36 Alerts. The volumes attributed to these issues will be excluded from reporting metrics used to establish the TRTs but will be set out separately in the monthly reports (The report for May 2022 has been included in Appendix D for reference). These and any subsequently agreed exclusions will be reviewed at least annually and can be removed or included as approved by SEC Panel.

Table 6. Exclusions

Type	Definition	Impact	Rationale
Large Power Outages	An outage, or a combination of outages affecting over 30 000 properties within one minute in any region.	Both technology types. AD1 Alerts only.	CSPs are limited to sending 5,000 AD1 Alerts. This is due to the throttling implemented by the DSP on message volumes. DSP throttling will come into effect once the power outage Alert volumes are greater than 30,000 premises in a one-minute window. It will remain in effect until the volumes drop below this threshold.
ESME/CH Generated Abnormal Volumes	Devices producing abnormal volumes of Alerts: more than 40 AD1 Alerts per month or 300 8F35 and/or 8F36 Alerts per month. Evidence of the volume thresholds is included in Appendix C.	Both technology types. Both Alert types.	An ESME may send an abnormal volume of 8F35 and/or 8F36 Alerts or a CH may send an abnormal volume of AD1 Alerts that can negatively impact performance. DCC will use the monthly Power Interruption Data reports to demonstrate which devices and the volumes of those alerts have been excluded for abnormal volumes.
Duplicated Alerts	The first AD1 Alert received will be used within the performance measures and any duplicated AD1 Alerts relating to the same power outage will be excluded.	Long-range radio technology only. AD1 Alerts only.	Multiple AD1 Alerts are generated and sent during a power loss event to maximise successful delivery. Any Alert found to be a duplicate will be discarded by DSP. A duplicate is categorised as any alert with the same payload outage time stamp (Date: Hour: Minute) as a previous alert.

Type	Definition	Impact	Rationale
Undelivered Alerts During Planned & Unplanned DCC/CSP Maintenance	DCC are unable to deliver Alerts if the CSP and/or DSP network is unavailable for planned or unplanned maintenance.	Both technology types. Both Alert types.	AD1, 8F35 and 8F36 Alerts are unsolicited Alerts (An Alert that the CH or ESME sends without being asked) and as such during planned or unplanned maintenance will not be delivered. DNOs do not have a methodology of obtaining information surrounding other unsolicited Alerts, including voltage alerts or tamper alerts, and these will be lost. However, for power outage events DNOs may be notified by other methods such as network monitoring and/or customer contact. No Alerts will be sent during planned or unplanned maintenance situations however this service failure will be managed through the DCC's Service Availability performance metric and not through Alert Management, thus this is not included in the exclusions.

Monthly reports will present the excluded Alerts, identify their type, volume and the potential impact on the delivery times.

These exclusion types will be reviewed at least annually and can be amended using the process documented in Section 4.

4 Annual Reviews

The DCC is required to complete a review, at least annually of the performance of POAs, PRAs and any associated exclusions as part of Section H3.14B.

The methodology, exclusions, TRTs and performance metric(s) set out in this document will be consulted upon, with sufficient time for SEC Parties to review any changes and supporting evidence at least annually.

DCC will seek approval of new TRTs, performance metrics and exclusions, for each subsequent 12-month period, prior to its commencement. DCC will be expected to provide the following information for consideration at the annual review:

- Summary tables of previous 12 months performance data for different WAN technology types and Alert types (including alerts from polyphase meters)
- Current set of exclusions and evidence to continue their inclusion or omission from reporting metrics
- Methodology to set the TRTs and performance metrics
- Table of proposed changes to the existing TRTs and performance metrics along with evidence to justify their revision

New TRTs, performance metrics and exclusions will be presented after the ninth reporting month, to allow suitable time for consultation with SEC Parties and approval by SEC Panel.

The first annual review following the implementation of MP096 will set the polyphase power outage and power restoration TRTs, including the associated enduring methodology and any relevant exclusions.

4.1 Updating the Alerts Management Document

The process for updating the document will commence with DCC presenting and consulting upon any proposed revisions to the document with all SEC Parties after the ninth reporting month.

The DCC will circulate their proposed amendments with accompanying detailed rationale and impact assessments to all SEC Parties, paying particular attention to seek the views of Electricity Network Parties while providing them with sufficient time to respond. This will be followed by a minimum of 15 working day consultation inviting all SEC Parties to provide feedback.

An updated change-controlled version of the Power Outage & Restoration Alerts Delivery Management Document, including clear indications of accepted and/or rejected proposals and SEC Party feedback will be presented to SEC Panel for final approval.

Once SEC governance approval has been achieved the Power Outage & Restoration Alerts Delivery Management Document will be updated by the DCC. This will include updating the Revision History Document Control table (page 2) and any subsequent evidence will be attached and referenced in additional appendices. The new version will be sent to all Electricity Network Parties and published on the SECAS website 10 working days prior to the first period of the commencing year.

4.2 Reporting

DCC will produce monthly performance statistics for each individual DNO within five working days after calendar month end. This will include details regarding AD1, 8F35 and 8F36 Alert TRT and performance metric including and excluding exclusions, volume and rationale of any exclusions.

Alert management reporting of AD1, 8F35 and 8F36 Alerts forms part of Section H13.4 reporting and the DCC shall report on its performance set out in the Power Outage & Restoration Alerts Delivery Management Document.

The Alert Management Report for May 2022 is attached in Appendix D and will form part of the DCC Performance Indicators Document as defined in the Performance Metric Measurement (PMM) report which measures several service metrics and which DCC report upon in accordance with Section H13.5.

Please see the PMM for the new inserted text referencing the new Performance Indicators.

Appendix A – Second or Third Generation Cellular Technology Performance

The following tables and graphs summarise the Alert performance for AD1, 8F35 and 8F36 Alerts for a CSP system predominantly deploying second or third generation cellular technology and provides evidence to support the TRTs.

Exclusions as set out in Section 3 have been applied to the data.

A-1 Power Outage Alerts – AD1 Alerts

The following table presents 11 months of performance data which has been used to evaluate the TRT for AD1 Alerts.

Table A-1 Power Outage Alerts – AD1 Alerts

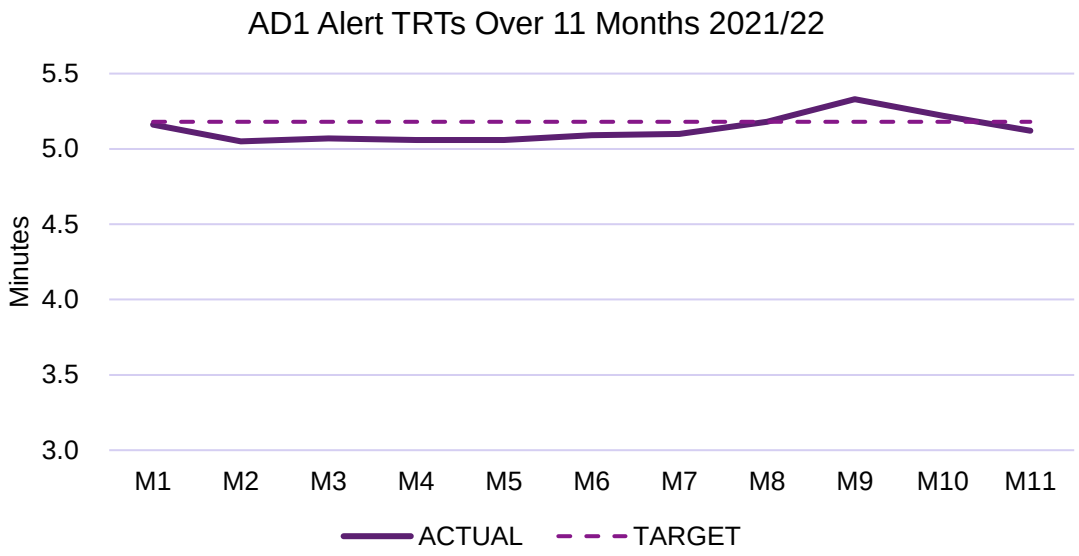
	Month	Time of 95th Centile (min)	Comments
M1	Nov-20	5.16	
M2	Dec-20	5.05	
M3	Jan-21	5.07	
M4	Feb-21	5.06	
M5	Mar-21	5.06	
M6	Apr-21	5.09	
M7	May-21	5.10	
M8	Jan-22	5.18	Target TRT
M9	Feb-22	5.33	DSP throttling impacted performance – not representative of normal CSP system behaviour
M10	Mar-22	5.22	
M11	Apr-22	5.12	
	TARGET	**5 minutes 11 seconds**	**Ref: Jan 2022**

The performance data from June 2021 through to December 2021 for AD1 Alerts sent via second or third generation cellular technology has been discounted. Performance during these months was worse than that for other months and does not represent normal system behaviour. This abnormal behaviour was due to a defect on the cellular technology system which affected the delivery of AD1 Alerts only.

The performance target of five minutes 11 seconds for AD1 Alerts is unlikely to vary significantly as increased volume of installed and commissioned CHs will not impact the second or third generation cellular technology network. The target set in the first year should be validated each year but is unlikely to need changing.

The following graph plots shows the number of minutes taken to deliver 95% of AD1 Alerts for 11 months and the static nature of the delivery of AD1 Alerts.

Graph A-1 AD1 Alerts Actual Performance and Targets over 11 months from data in Table A-1



A-2 Power Restoration Alerts – 8F35/8F36 Alert

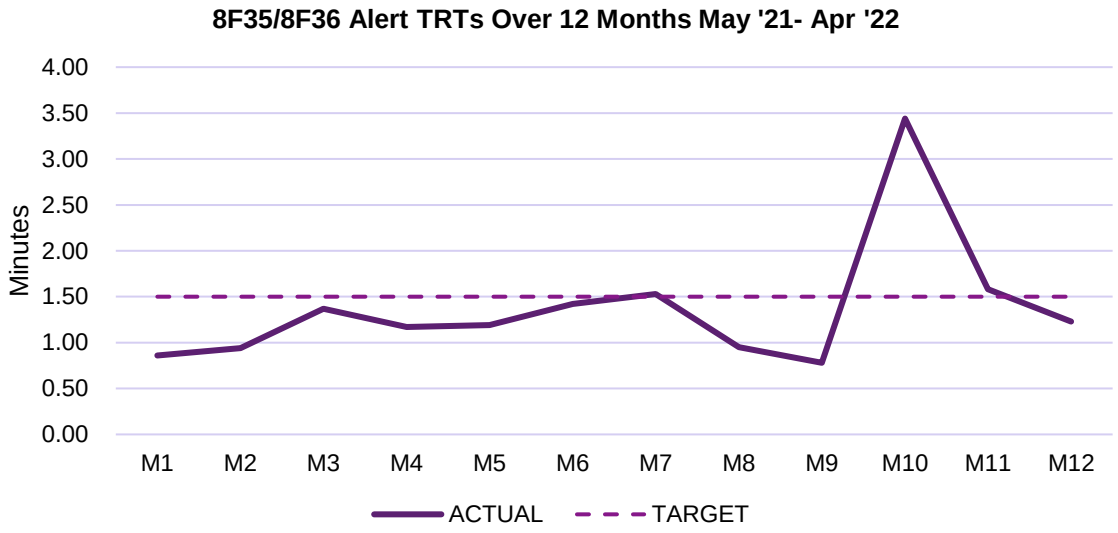
The following table presents the data which has been used to validate the TRT for 8F35 and/or 8F36 Alerts as included in Section 2.1.

Table A-2 Power Restoration Alerts – 8F35/8F36 Alert – Cellular Technology

	Month	Time of 95th Centile (min)	Comments
M1	May-21	0.86	
M2	Jun-21	0.94	
M3	Jul-21	1.37	
M4	Aug-21	1.17	
M5	Sep-21	1.19	
M6	Oct-21	1.42	
M7	Nov-21	1.53	
M8	Dec-21	0.95	
M9	Jan-22	0.78	
M10	Feb-22	3.44	DSP throttling impacted performance – not representative of normal CSP system behaviour
M11	Mar-22	1.58	Target was missed due to planned maintenance window – alerts have not been removed but event is exempt and called out as the reason for failing the target
M12	Apr-22	1.23	
	TARGET	**1 minute 30 seconds**	

The following graph plots the actual performance of all 8F35 and/or 8F36 Alerts delivery over the last 12 months against the TRT of one minute 30 seconds.

Graph A-2 Power Restore Alerts – 8F35/8F36 Alerts Actual Performance and Targets over 12 months



Appendix B – Long-Range Radio Technology Performance

The following tables and graphs summarise the performance for AD1, 8F35 and 8F36 Alerts for a CSP system predominantly deploying long-range radio technology and provides evidence to support the TRTs.

Exclusions as set out in Section 3 have been applied to the data presented.

B-1 Power Outage Alerts – AD1 Alerts

The following table presents the data which has been used to calculate the AD1 Alert TRT as included in Section 2.2.

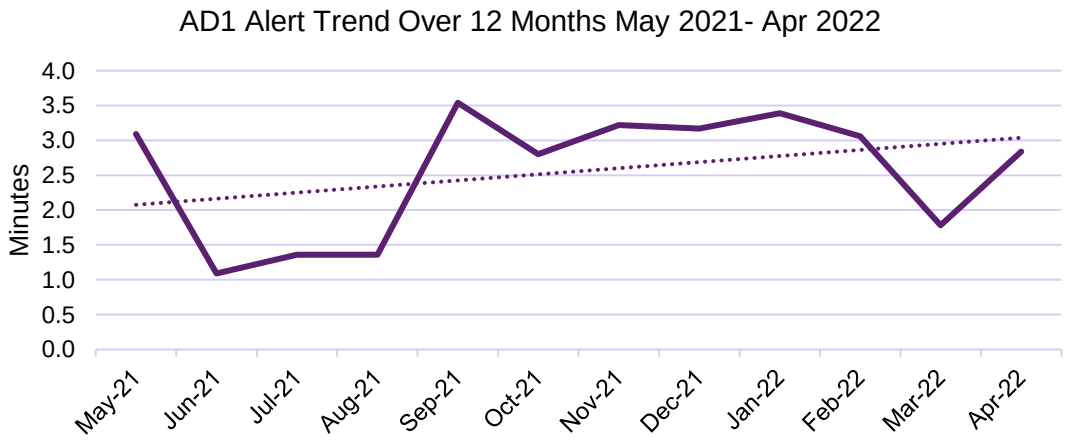
Table B-1 AD1 Alerts – Long-Range Radio Technology

	Month	Time of 95th Centile (min)
M1	May-21	3.09
M2	Jun-21	1.09
M3	Jul-21	1.36
M4	Aug-21	1.36
M5	Sep-21	3.54
M6	Oct-21	2.80
M7	Nov-21	3.22
M8	Dec-21	3.17
M9	Jan-22	3.39
M10	Feb-22	3.06
M11	Mar-22	1.78
M12	Apr-22	2.84
	TARGET	**4 minutes 5 seconds**

Target is based upon extrapolation (see Graph B-2 below).

AD1 Alert delivery time performance is expected to decrease as the traffic increases over the long-range radio network. The following graph shows the emerging trendline showing the increase in the TRT over the last 12 months.

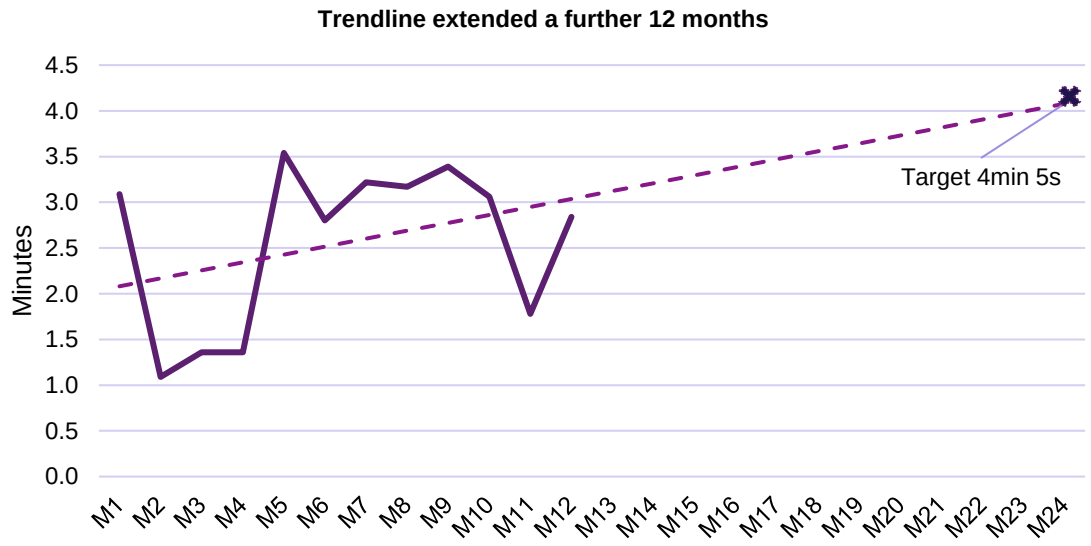
Graph B-1 AD1 Alerts – Emerging Trend over 12 months



The trendline in the graph above shows the delivery time for the 95th Centile of AD1 Alerts has increased by just over 60 seconds over the last 12 months from May 2021 to April 2022.

If the trendline over the last 12 months is extrapolated out over a further 12 months then the TRT would increase to four minutes five seconds. The assumed linear relationship is predicated on several operational assumptions which are included in Table 2 of Section 1.2.4.

Graph B-2 Extrapolated Trendline over 24 months



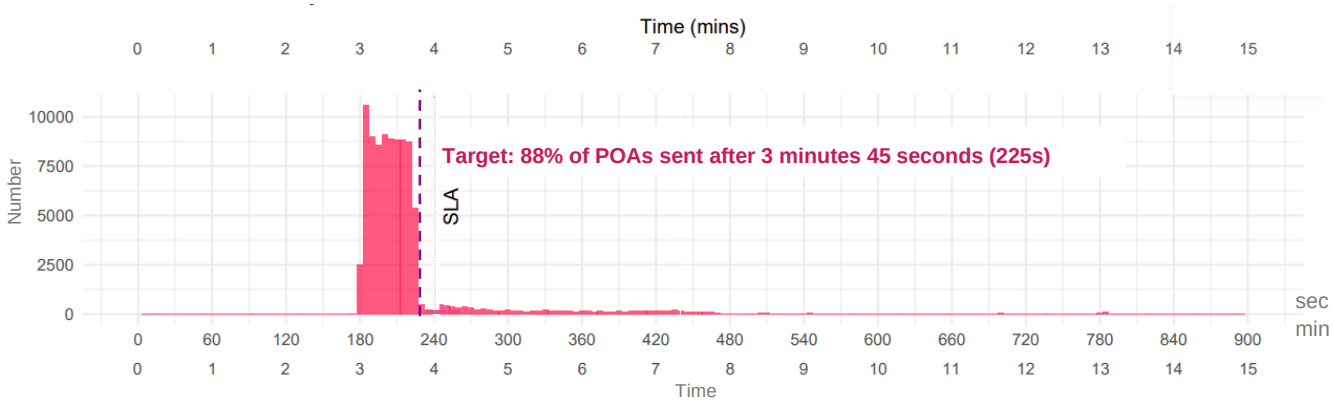
Block line shows actual, dash line shows trend

Percentage of AD1 Alerts sent within 45s after the 3rd minute of the power outage

Graph B-3 shows the April 2022 volume of AD1 Alerts. The target of 88% has been included and corresponds to the initial large volume of all AD1 Alerts received.

The target percentage has been calculated using the number of AD1 Alerts sent by the 225th second (three minutes 45 seconds), reported as a percentage each month for 12 months, averaged over that 12-month period.

Graph B-3 Number of AD1 Alerts sent in APR-22 after the 3rd minute of a power outage



B-2 Power Restoration Alerts – 8F35/8F36 Alerts

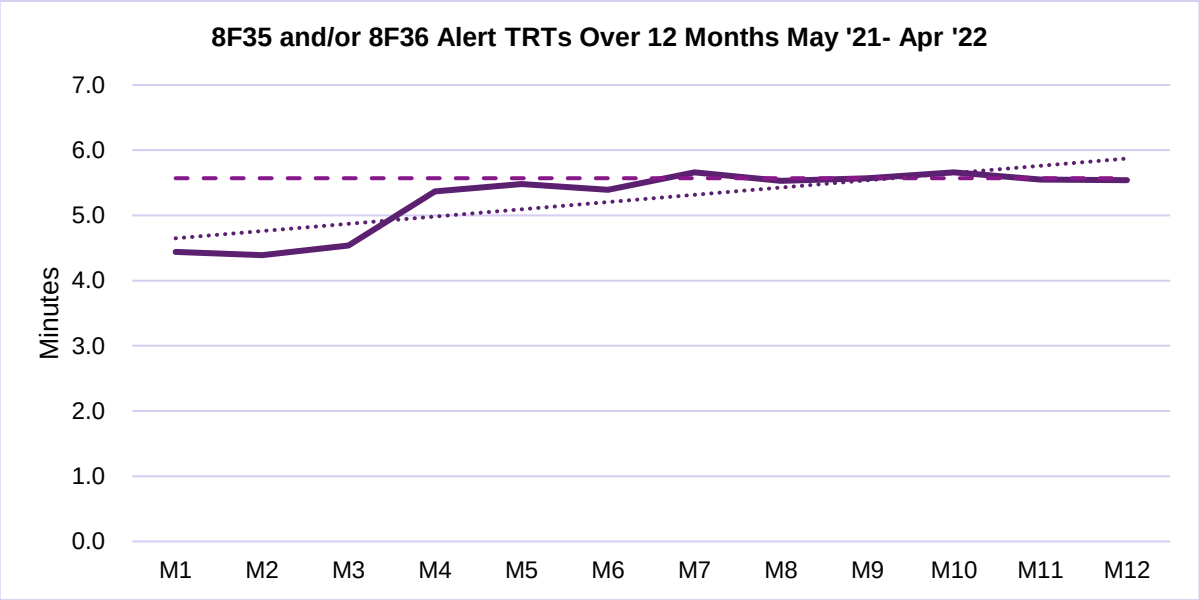
The following table presents the data which has been used to calculate the TRTs for 8F35 and/or 8F36 Alerts as included in Section 2.2.

Table B-2 Power Restore Alerts – 8F35 and/or 8F36 Alert

	Month	Time of 95th Centile (min)	Comments
M1	May-21	4.44	
M2	Jun-21	4.39	
M3	Jul-21	4.54	
M4	Aug-21	5.37	
M5	Sep-21	5.48	
M6	Oct-21	5.39	
M7	Nov-21	5.66	DSP throttling impacted performance – not representative of normal CSP system behaviour
M8	Dec-21	5.53	
M9	Jan-22	5.57	Target TRT
M10	Feb-22	5.66	DSP throttling impacted performance – not representative of normal CSP system behaviour
M11	Mar-22	5.55	
M12	Apr-22	5.54	
	TARGET	**5 minutes 34 seconds**	**Ref: Jan 2022**

It is expected that the delivery time performance of the 8F35 and/or 8F36 Alerts will decrease as the volume of traffic increases over the long-range radio network. The following graph shows the trend line showing the increase in TRTs over the last 12 months.

Graph B-4 8F35 and/or 8F36 Alerts Trend over 12 months



The small dotted red line represents trendline, the dash line represents the target and the block line represents actuals

The trendline in the graph above shows performance of 8F35 and/or 8F36 Alerts have improve by just under 90 seconds over the last 12 months from May 2021 to April 2022.

It is not proposed that the trendline be extrapolated over the following 12 months as in the case of AD1 Alerts, instead the trend is anticipated to be more static in accordance with Assumption – Section 1.2.4, Table 2, ID#A7

Appendix C – Exclusions Evidence

There are a small number of CHs that send abnormal volumes of AD1 Alerts to the DNO, which could be either due to a defective CH or the ESME dropping the voltage to the CH, leading the CH to believe power has been lost.

An even smaller number of ESME's also send abnormal volumes of 8F35 and 8F36 Alerts. However, these devices are outside of DCC's control and therefore no investigation has been carried out to understand why this is.

Energy Suppliers are required to investigate and where needed exchange these ESMEs and/or CHs. There is no obligation on the supplier to report to DCC which Devices were faulty.

DCC do not have the ability to confirm which alerts are spurious and which are genuine. Therefore, data has been used to ascertain a volume of which is most likely to be spurious and have used the rationale below to ascertain abnormal volume of AD1, 8F35 and 8F36 Alerts which will be excluded from reporting. DNOs get reports showing Devices in their network area producing abnormal volumes and therefore excluded from reporting.

Table C-1 Abnormal Volume Limits

Alert Type	Limit	Rationale	Evidence for Exclusions
AD1 Alert	>40 Alerts for a CH in one calendar month	Cut off point set at volumes generated by <0.01% of total number of CHs	0.01% CHs generated 13.35% of total number of AD1 Alerts
Total of 8F35 and 8F36 Alerts	>300 Alerts for any ESME in one calendar month	Cut off point set at volumes generated by <0.05% of the total number of ESMEs	0.05% ESMEs generated circa 4.70% of total number of 8F35 and/or 8F36 Alerts

This table sets out the volumes of Alerts excluded but more importantly indicates the very small number of Devices that this represents.

The following table represents actual volumes of AD1 Alerts sent per Device as a percentage of the total number across April 2022. The shaded rows represent the CHs which have sent more than 40 AD1 Alerts which have been excluded from the calculations as a percentage of the total number of CH and total number of AD1 Alerts, and therefore reporting.

Table C-2 Abnormal Volume of AD1 Alerts – Cut Off Shown in Shaded Rows

Number of AD1's per CH	% of CHs	% of AD1s
Between 1 & 10	99.763%	84.609%
Between 11 & 20	0.110%	1.090%
Between 21 & 30	0.037%	0.650%
Between 31 & 40	0.012%	0.303%
TOTAL	99.95%	87.96%

The following tables C-3, C-4 and C-5 shows the number of 8F35 and 8F36 Alerts sent per ESME in April 2022. The shaded rows represent the volume of excluded Alerts. This provides evidence of the very small percentage of 8F35 and/or 8F36 Alerts that send more than 300 8F35 and/or 8F36 Alerts per Device.

Table C-3 Abnormal Volumes of 8F35 & 8F36 Alerts

The following table shows the combined volume of 8F35 and 8F36 Alerts and the shaded rows where the abnormal volume limit has been applied.

Number of Alerts per ESME	ESME	Alerts	% of ESMEs	% of Alerts
Between 1 & 25	578689	936158	94.884	18.992
Between 26 & 50	2013	77042	0.33	1.563
Between 51 & 75	3581	230733	0.587	4.681
Between 76 & 100	5633	499358	0.924	10.131
Between 101 & 125	6525	737445	1.07	14.961
Between 126 & 150	5674	779616	0.93	15.816
Between 151 & 175	3792	613993	0.622	12.456
Between 176 & 200	2011	375308	0.33	7.614
Between 201 & 225	1013	214150	0.166	4.344
Between 226 & 250	462	109062	0.076	2.213
Between 251 & 275	195	51100	0.032	1.037
Between 276 & 300	99	28561	0.016	0.579
Over 300	205	276719	0.034	5.614

The following tables C-4 and C-5 show the volume of 8F35 and 8F36 Alerts separately:

Table C-4 Abnormal Volumes of 8F35 Alerts – Cut Off Shown in Shaded Rows

Number of 8F35s per ESME	ESME	8F35	% of ESMEs	% of 8F35s

Between 1 & 25	577,235	88,0972	94.883	18.575
Between 26 & 50	2,048	78,642	0.337	1.658
Between 51 & 75	3,746	241,459	0.616	5.091
Between 76 & 100	5,910	523,731	0.971	11.043
Between 101 & 125	6,719	759,370	1.104	16.011
Between 126 & 150	5,712	784,853	0.939	16.548
Between 151 & 175	3,723	602,514	0.612	12.704
Between 176 & 200	1,891	352,682	0.311	7.436
Between 201 & 225	880	185,869	0.145	3.919
Between 226 & 250	322	75,895	0.053	1.600
Between 251 & 275	107	27,908	0.018	0.588
Between 276 & 300	20	5,742	0.003	0.121
Over 300	51	223,214	0.008	4.706
TOTAL	**608,364**	**4,742,851**	**100.000**	**100.000**

Table C-5 Abnormal Volume of 8F36 Alerts – Cut off will be 300

Number of 8F36s per ESME	ESME	8F36	% of ESMEs	% of 8F36s
Between 1 & 25	50,589	58,879	97.600	31.588
Between 26 & 50	101	3,960	0.195	2.125
Between 51 & 75	217	13,985	0.419	7.503
Between 76 & 100	330	28,944	0.637	15.528
Between 101 & 125	273	30,712	0.527	16.477
Between 126 & 150	168	23,082	0.324	12.383
Between 151 & 175	99	15,898	0.191	8.529
Between 176 & 200	41	76,82	0.078	4.121
Between 201 & 225	14	3,002	0.027	1.612
Between 226 & 250	1	250	0.002	0.134
TOTAL	**51,833**	**186,394**	**100.000**	**100.000**

Appendix D –Monthly Report for May 2022

PWO101NU – Power Interruption Data

01 May 2022 – 01 Jun 2022

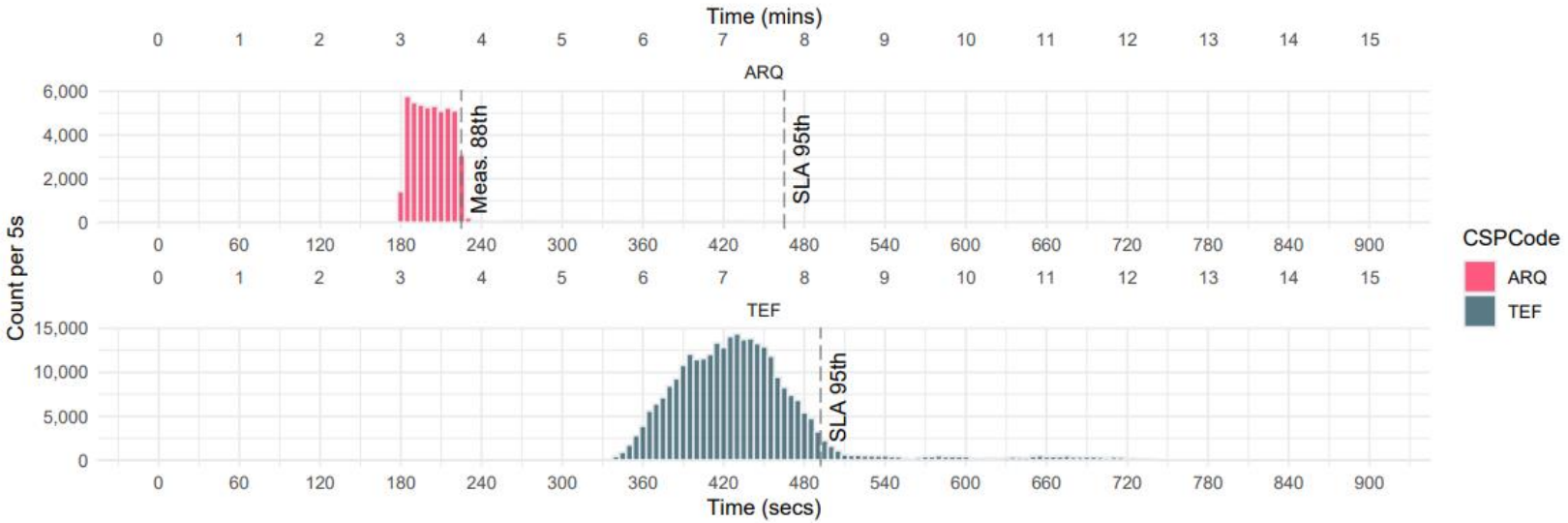
DCC Controlled

Data Communications Company

Data Communications Company

POA Timings (DSP Sent)

Count of POA Delivery Times: 01 May 2022 to 01 June 2022



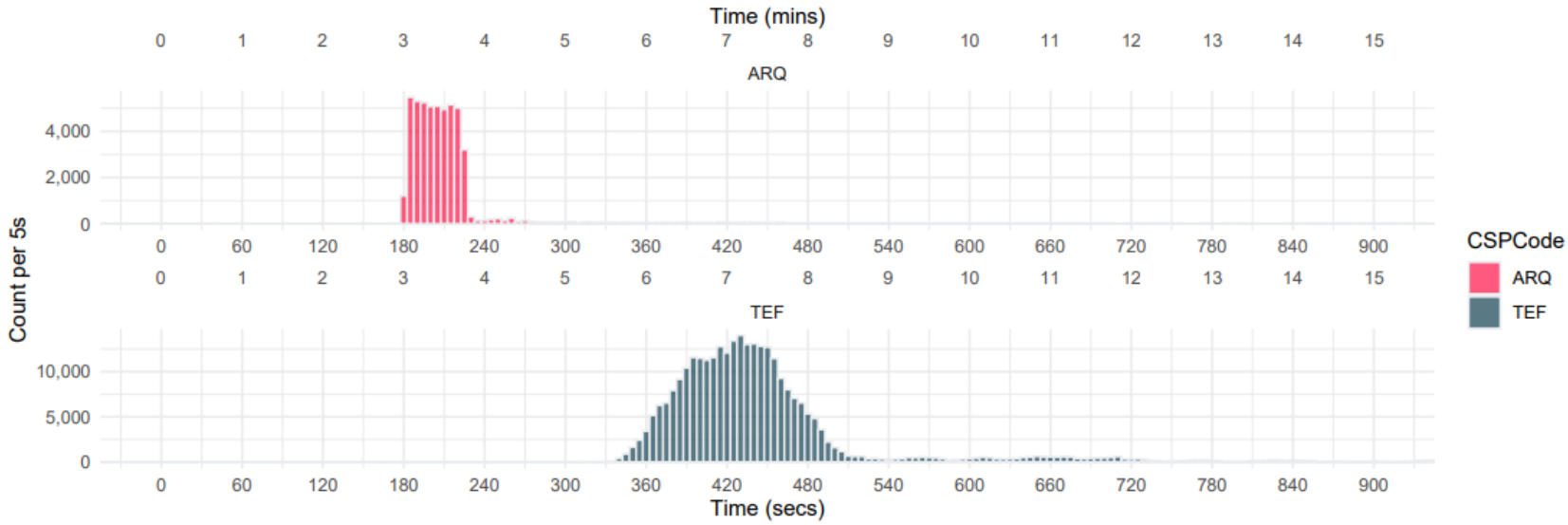
CSPCode	Count	Median	Lower Quartile	Upper Quartile	IQR	5th Centile	95th Centile	Compliance 88th	Compliance 95th
ARQ	50,917	204.55s (~3.41 minutes)	192.52s (~3.21 minutes)	216.68s (~3.61 minutes)	24.15s	183.44s (~3.06 minutes)	326.33s (~5.44 minutes)	+3.84%	+2.41%
TEF	295,065	428.36s (~7.14 minutes)	399.16s (~6.65 minutes)	455.86s (~7.6 minutes)	56.69s	366.88s (~6.11 minutes)	560.68s (~9.34 minutes)		-3.41%

Data Communications Company

Data Communications Company

POA Timings (RTT)

Count of POA Delivery Times: 01 May 2022 to 01 June 2022

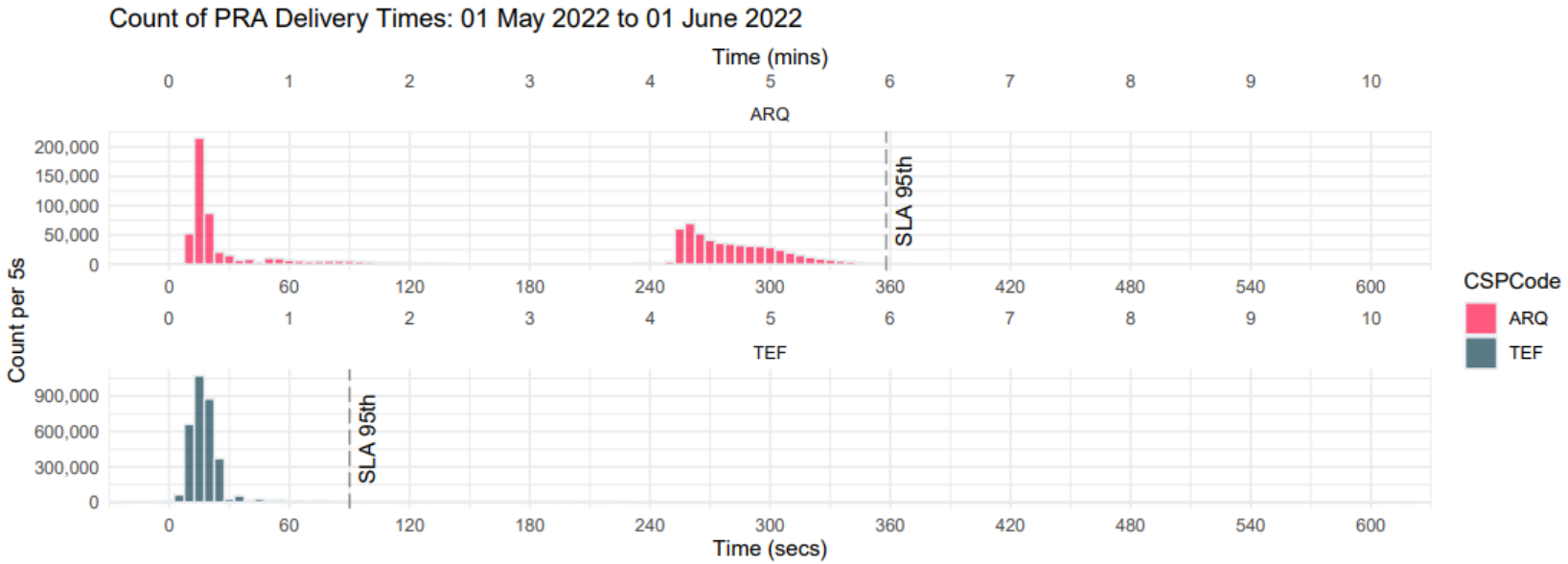


CSPCode	Count	Median	Lower Quartile	Upper Quartile	IQR	5th Centile	95th Centile
ARQ	50,917	205.59s (~3.43 minutes)	193.05s (~3.22 minutes)	218.09s (~3.63 minutes)	25.05s	183.6s (~3.06 minutes)	363.49s (~6.06 minutes)
TEF	295,065	430.73s (~7.18 minutes)	400.8s (~6.68 minutes)	460.43s (~7.67 minutes)	59.63s	368.09s (~6.13 minutes)	681.89s (~11.36 minutes)

Data Communications Company

Data Communications Company

PRA Timings (DSP Sent)



CSPCode	Count	Median	Lower Quartile	Upper Quartile	IQR	5th Centile	95th Centile	Compliance 95th
ARQ	1,101,735	255.21s (~4.25 minutes)	17.51s	283.25s (~4.72 minutes)	265.73s (~4.43 minutes)	12.29s	346.36s (~5.77 minutes)	+0.40%
TEF	3,531,251	16.7s	12.74s	20.75s	8.01s	8.04s	106.3s (~1.77 minutes)	-0.32%

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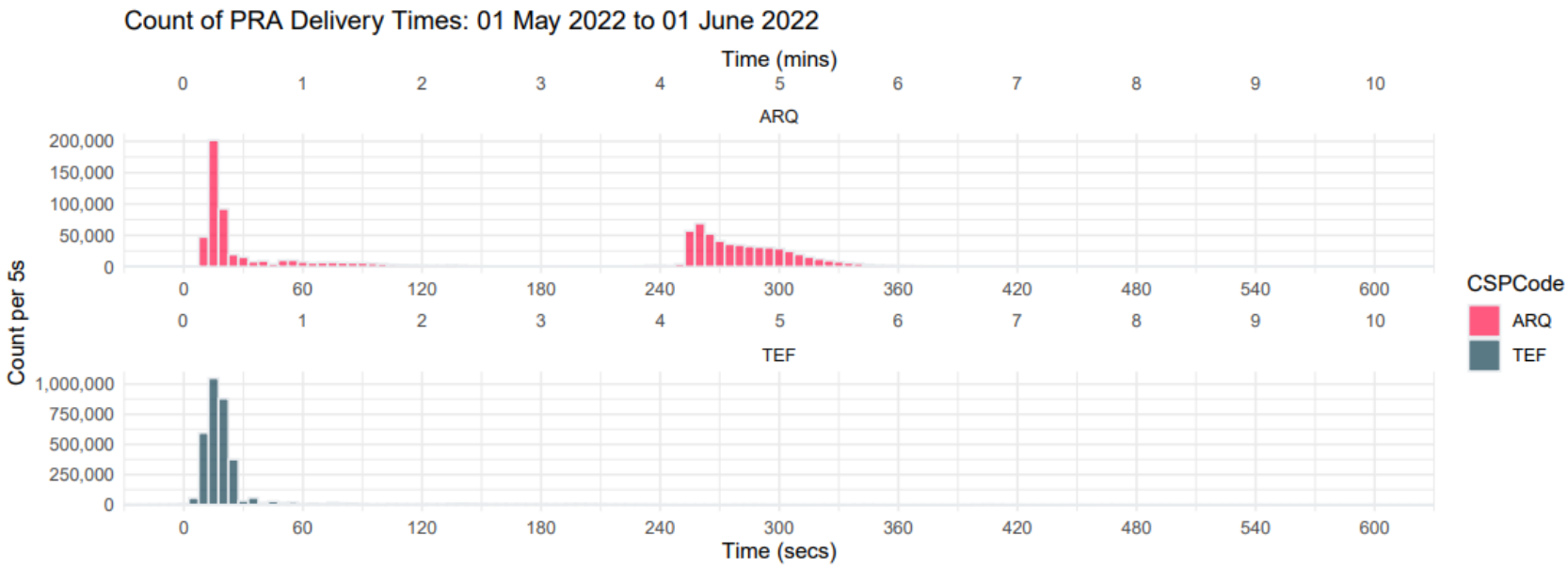
PRA Timings (RTT)



CSPCode	Count	Median	Lower Quartile	Upper Quartile	IQR	5th Centile	95th Centile
ARQ	1,101,735	255.57s (~4.26 minutes)	17.93s	284.44s (~4.74 minutes)	266.51s (~4.44 minutes)	12.54s	362.31s (~6.04 minutes)
TEF	3,531,251	17.37s	13.05s	22.15s	9.1s	8.33s	156.9s (~2.62 minutes)

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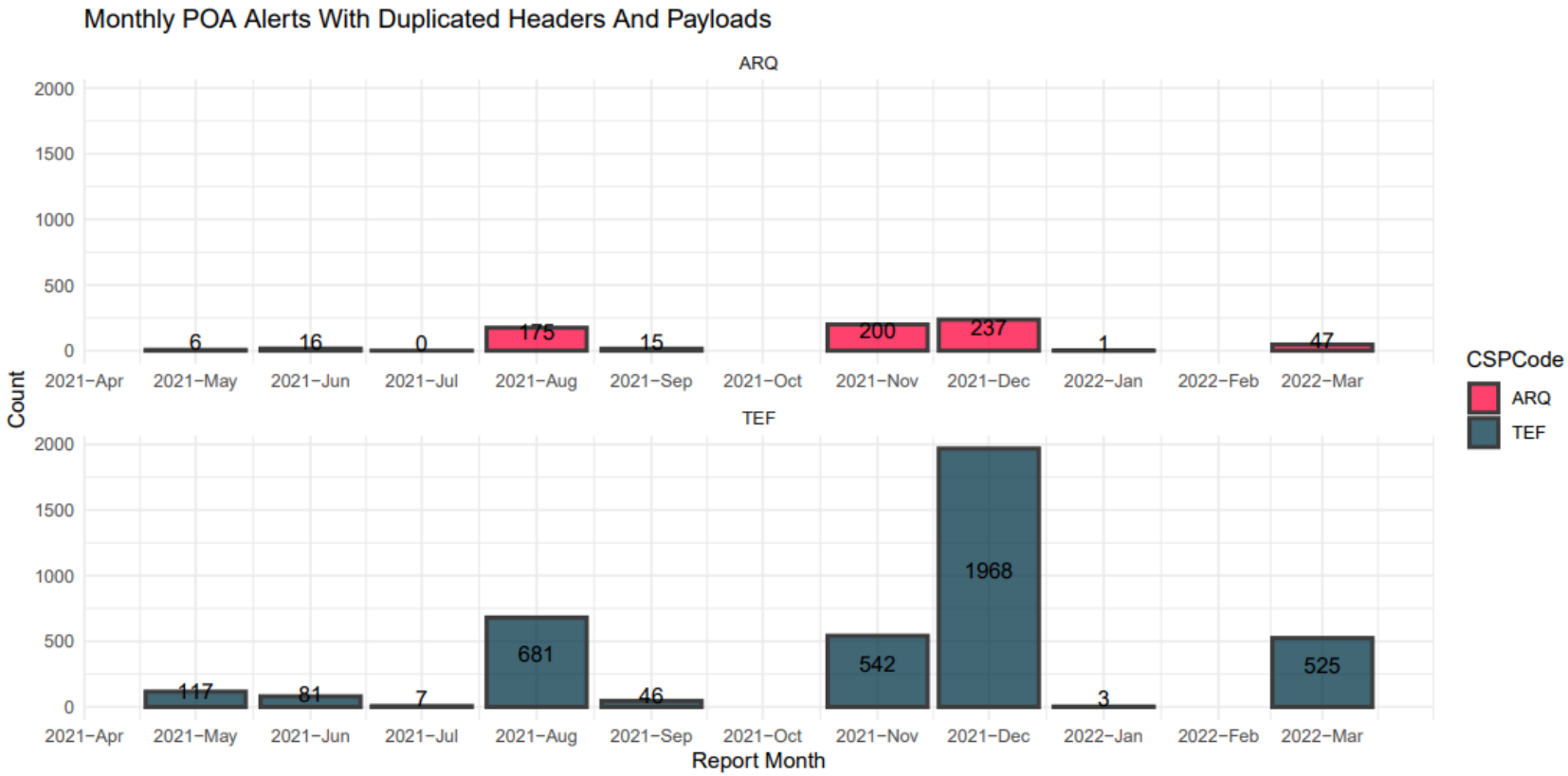
POA Duplicate Headers



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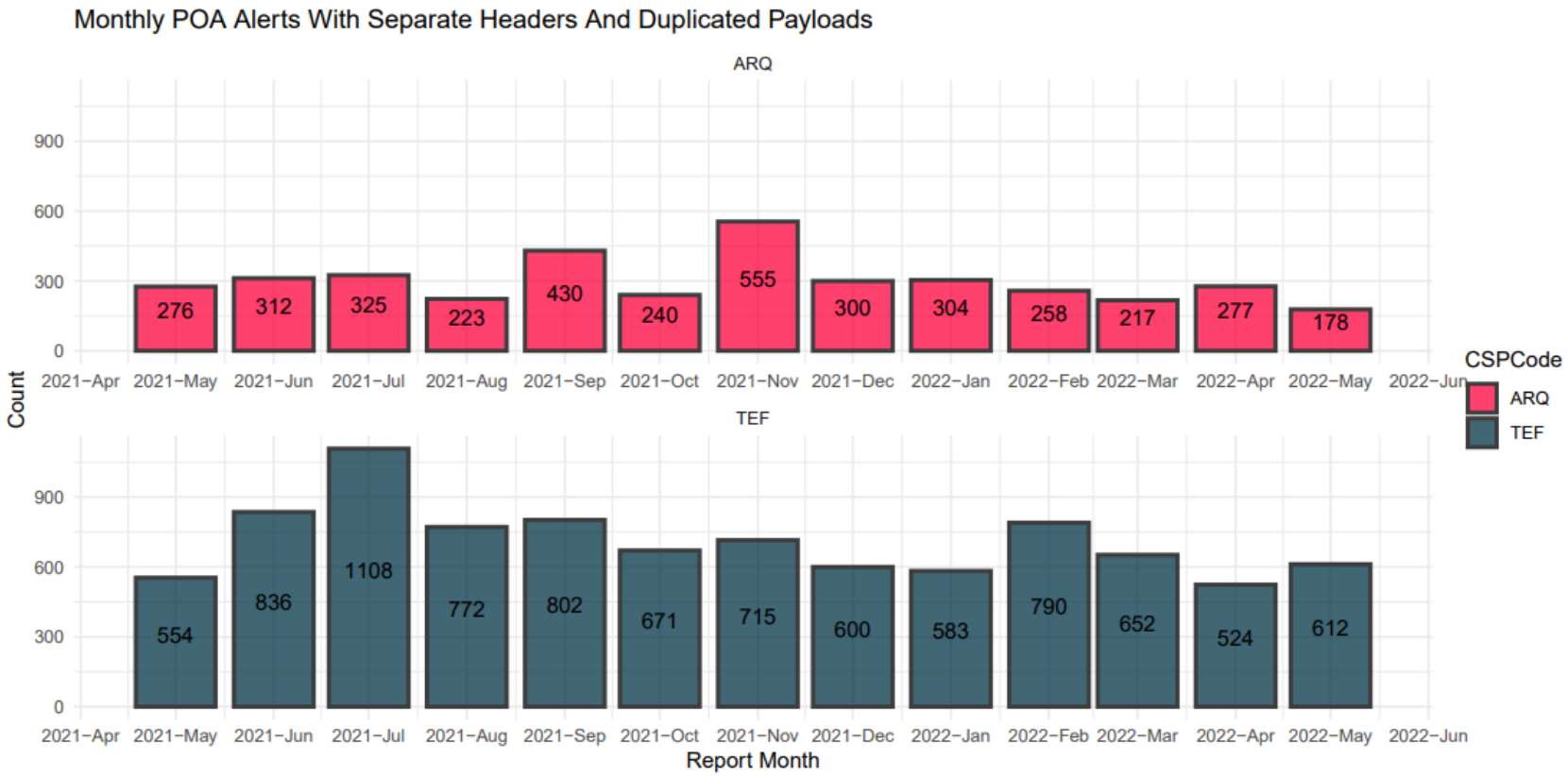
POA Duplicate Payloads



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DCC Controlled

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Data Communications Company

Missing POA/PRA Alerts: 01 May 2022 to 01 June 2022

Block_Scenario	Block_text	PowerInterruptionGrThn3Mins	Valid_Scenario	Count	Percentage	Percentage_Excl_S2
3	AD1		FALSE	259,217	5.465%	57.136%
1a	AD1-8F36-8F35	no	FALSE	451	0.010%	0.099%
2a	8F35	no	TRUE	4,288,386	90.408%	
4a	AD1-8F35	no	FALSE	39,352	0.830%	8.674%
5a	AD1-8F36	no	FALSE	39	0.001%	0.009%
6a	8F36-8F35	no	FALSE	181	0.004%	0.040%
7a	8F36	no	FALSE	21	0.000%	0.005%
1b	AD1-8F36-8F35	yes	TRUE	43,838	0.924%	9.663%
2b	8F35	yes	FALSE	1,272	0.027%	
4b	AD1-8F35	yes	FALSE	571	0.012%	0.126%
5b	AD1-8F36	yes	FALSE	2,350	0.050%	0.518%
6b	8F36-8F35	yes	FALSE	106,141	2.238%	23.395%
7b	8F36	yes	FALSE	1,526	0.032%	0.336%

Note: This data is susceptible to device clock drift, therefore it should be taken as advisory and not used as a performance metric.