

## Minutes

<b>Meeting name</b>	Outage Change Management Round Table
<b>Date of meeting</b>	Tuesday 18 November 2014
<b>Time</b>	10:00 – 15:00
<b>Location</b>	SSE, One Waterloo Street, Glasgow, G2 6AY

## Attendees

<b>Name</b>	<b>Initials</b>	<b>Company</b>
Ivan Kileff	IK	Chairperson – National Grid
Catherine Hiorns	CH	Technical Secretary – National Grid
Mark O'Connor	MOC	National Grid
Keith Dan (part)	KD	National Grid
Leonardo Costa	LC	Ofgem
Milorad Dobrijevic	MD	SPT
Alan Kelly	AK	SPT
Neil Sandison	NS	SHE Transmission
Mahesh Dayal	MDa	SHE Transmission
Emma Morris	EM	SONI
Campbell McDonald	CMD	SSE
Mike Cruickshank	MC	SSE
Euan Fraser	EF	Falck Renewables
Joe Dunn	JD	SPR
Martin Macphee	MM	Eneco
Graham West	GWe	EDF Energy Renewables
Scott Mackenzie	SM	Infinis
Kevin Armstrong	KA	Natural Power
Stefan Shaba	SS	GreenPower

## Apologies

Sarmukh Hunjan	SH	EDF
Ian Gaunt	IG	RWE
Hamish Ellen	HE	RWE
Gareth Barry	GB	Statkraft
Stuart Shaw	SSh	Statkraft
Alastair Frew	AF	Scottish Power
Graham Wood	GW	SHE Transmission
David Bowie	DB	Scottish Power
Ross Cant	RC	Vattenfall
Alistair Parlett	AP	Natural Power
Graeme Cooper	GC	Fred Olsen Renewables

## 1 Introductions and Agenda Review

1. Everyone was thanked for coming, it was noticed that this was clearly a topic many people felt passionate about as a large number of generators were represented in the room.

### 2.1 Overview of Work Done

2. IK covered the purpose of the meeting: to go over the work done by the Outage Change Management group formed under the STC Modification Panel and establish whether any further work was required. The Terms of Reference of the group was:
  - a. With regard to generators with non standard connections, whether:
    - i. There can be less change in the transmission outage plan that affects these generators
    - ii. There can be improved notification of any changes to these generators
    - iii. Outages affecting these generators can be planned further in advance in the interest of efficiency and costs to these generators
    - iv. It is efficient to wait till an outage is analysed and assessed as viable by the System Operator before communicating the outage to these generators
    - v. Whether the general outage management process can be improved
  - b. Review the outage management process sections of the code to determine whether they are reasonable and whether there are any changes which would allow greater engagement with generators that have non standard connections
3. This derived from an initial concern raised by CMD. The Outage Change Management group have worked to address the concerns listed in the Terms of Reference, which has resulted in changes being made to transmission circuit outage management working practices. The group also carried out a survey of generators with non standard connections in Scotland to understand the range of concerns. The draft group report was shared with the generators who responded to the survey, which resulted in further feedback from generators, which was included in the report. The report was presented to the October STC Modification Panel. This report is now on the website<sup>1</sup>.
4. IK highlighted the improvements made to the outage management process, which included: improvements in TO working practice, which would be covered further in agenda item 3.1. On whether there could be improved notification of changes – work done included including the description of work involved in the TOGA reports at the year ahead stage, though this data would not be populated retrospectively; and carrying out an audit of generator contact details and correcting discrepancies.
5. On whether transmission circuit outages can be planned further in advance: IK highlighted the challenges posed by developing a robust plan a long time into the future. IK noted there was a drive by the TOs to ensure that investments are efficient, this can result in late investment decisions. The consequence of this can be many changes to the long term plan.
6. On whether it is efficient to wait till an outage has been assessed as viable by the SO before communicating it to the generators: on a trial basis, during ‘current year’ timescales, National Grid will provide generators with non standard connection TO requested changes (via email) before they have been assessed by the SO. This would allow the impacted generators to be aware of a potential change that would impact them. This is to be reviewed after a year to

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<sup>1</sup> <http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/STC/Panel-information/Meetings/2013/29-October-2014/>

assess the usefulness of this additional information against the resource commitment required from the SO.

7. **Existing ACTION 1: SO to review advanced notification of outage change email, this is newly implemented for this next year**
8. MOC clarified this was additional information, not provided by the OC2 reports. OC2 reports only contain outages that have been approved by the SO, anything requested but not assessed is not included.
9. MOC further noted, for this year his team in 'longer term current year' (beyond 4 weeks ahead) had processed 3000 change requests. MC noted that this year it had been particularly challenging to keep track of all the changes, but the new email was useful in planning his own work load.
10. CMD observed the change is currently not within the code as it is on a trial basis. IK confirmed this was just an improvement to the general outage management process and at this stage there was currently not a view to add this to the relevant code.
11. IK noted further improvements have been made to the general outage management process. 3 weeks ahead of real time NGET's Scottish Delivery team are proactively informing all generators of any outages that may impact them. When this procedure results in a concern being highlighted a tri-party conference call is now established for this to be discussed and solution established.
12. MC highlighted the tri-party conference call yesterday was the first one he had been asked to attend. Previously the outages seemed to have gone ahead whether he opposed the work or not. MOC confirmed yesterday was first, 5 generators attended the call, MC supported this method and noted it was an improvement. MOC recognised there had been challenges in the past; hopefully telephone conference going forward this will be an improvement. Generators should inform MOC if they believe more tri-party conference calls are required to discuss specific outages.
13. IK further noted it was important to encourage all new generators to register in TOGA at the earliest opportunity; as they will not receive information on outages until they have registered in TOGA. Furthermore, once this process is complete, they will be able to access the generator section of TOGA and see outages from the system itself rather than the OC2 reports.
14. IK noted the conclusion from the work already done was there was no need to make changes to STCP 11-1 or STCP 11-2. It was felt the improvements made to the process can all be captured within the current framework.
15. There is unlikely to be no change in current year. MD confirmed the outage pattern for next year includes just under 1000 outages for SP alone. It is not possible to also plan for faults and defects the network will experience. One project could contain many different outages with different stakeholders; a small change could impact all of them. NS added that not all outage changes were bad, some included shortening outages or combining them to minimise the number.
16. IK discussed the survey feedback. The survey was produced as part of the investigations into outage change management. This aimed to establish issues that occurred during the process.
17. A request in the survey was to provide visibility of the works associated with an outage, so generators are able to understand the risks of this moving and how they will be impacted. SPT and SHE Transmission have agreed to add information to the 'Work Involved' field for the OC2 reports. This is not being done retrospectively, so may take some time before there is evidence of this information in OC2 reports.
18. A further point in the survey was for additional clarity in the duration of equipment outages, for example whether the generator would be impacted for switching time only, or for the

entire outage. IK noted this information is standard in TOGA report; the SO has an outstanding action to offer training courses to aid the interpretation of these reports.

19. It was request by a generator, through the survey, to be able to proactively notify the SO and TO of their preferred periods for outages to occur. This may be when a generator has their own maintenance scheduled, or on times of low wind. The SO and TO were open to this.
20. IK asked any generators that lacked the relevant diagrams to understand the OC2 reports to please talk to National Grid's Electricity Customer team. MC noted that operational staff do not have access to the relevant diagrams, previously they used to get diagram updates every couple of years from the TO. MD agreed that without a diagram it would not be possible to understand the outage information provided in the OC2 report. CMD noted that the outage conditions are key, and without a circuit diagram they cannot understand the OC2 report. CMD felt National Grid was therefore not meeting obligations of STCP 10-3 'SO shall notify.. of outage conditions'
21. KD noted the diagrams generators have are from the Connection Agreements, these diagrams would not cover the wider transmission system. Currently the only way to find this information would be to look through the Electricity Ten Year Statement diagrams. EF noted that there is no granularity in between and the Ten Year Statement does not include reference to switchgear, consequently is not helpful.
22. KD noted to understand impact of trip whilst there is an outage on a generator would require system diagrams beyond what would be included in the clause 10 agreements. KD to look to see if any internal diagrams can be adapted to suit this purpose.
23. IK highlighted that for wider system issues in BCA may not be able to see impact but would be compensated for this. MC noted that some BCAs are so far out of date no idea which circuits are covered. KD agreed and noted process had been implemented to resolve this.
24. **New ACTION 2: MOC and KD to investigate circuit diagrams inclusion in the BCA and e-mail notification e-mails.**
25. MOC noted STC 19-4 workgroup had been set up to look at commissioning documents, including changing of system diagrams. A paper is soon to be submitted to the STC Modification Panel. This will hopefully ensure proper switching diagrams are available to every generator.
26. IK covered outstanding issues, which included a review of the 'current year' communication of pending outages after it had been in place for a year, the review of the use of PLD's to establish if the process is working efficiently, and IK also noted the outstanding issue not on the slide is a training course to be run by National Grid for generators on how to interpret standard TOGA reports.
27. **Existing ACTION 3: MOC to arrange this training course.**
28. **Post Meeting Note: This was covered by MOC in the afternoon of this meeting. For any further queries please direct these at MOC. Therefore this action is now closed.**

## 2.2 Discussion

29. CMD initiated a discussion around the development of a KPI to assess the number of generator minutes lost due to transmission circuit outages. It was unclear how this would be measured and who would do so. MD felt this was an SO function, MOC was not convinced the SO would have all the relevant information.
30. MOC highlighted the example from yesterday's tri-party call where an embedded BELLA generator had lost 58 production days this year, the majority of these were distribution restrictions that National Grid were not aware of. MOC proposed generators themselves would be in a better position to record this information.
31. MD noted while there was a drive to minimise constraint payments this would not be done at the expense of non standard connections. MD noted the £2.6 billion of work for SP Transmission and SHE Transmission result in negative impacts on generation across the

board. MD highlight the aim was to safely, whilst maintaining a secure network, deliver the outage plan efficiently. Trying to balance everyone's requirements is particularly challenging, the Network Access Policy implemented in 2013 is aiding the achievement of these goals. MOC also highlighted 85-90% of all BSIS constraint costs are in Scotland, constraining embedded generation is the only option – in these instances of wider network issues non-firm connections are compensated through the Balancing Mechanism.

32. NS noted the TOs would be unable to track if nominated circuits in the BCA were switched out for maintenance. MOC agreed stating as the BCA was between NGET and the generator the TOs would not have the relevant information.
33. MD noted best place for KPI on time lost for generation would be the generators themselves, this would be comparable to the TO collating information on network outages; where the year ahead plan is compare to the current year and identify any discrepancies. A similar approach could work for the generators. EF noted it would be hard to bench mark this KPI against anything, and without doing so makes the measurement meaningless.

### 3.1 Network Access Policy and how TO's plan outages

34. MD presented slides on SP Energy Networks, explaining the TO point of view of transmission circuit outages. MD noted the significant increase of non-synchronous generators, this is the biggest change to the transmission network since the initial investment in the post-war era.
35. MD covered the RIIO T1 contract they have with Ofgem. Delivery of load and non load related projects over an eight year period, facilitate asset replacement and new connections. Forecast includes 11GW of additional wind generation over the next 8 years, requiring an increase in export capability from 3GW to 7GW. The investment aims to reduce the constraint cost, but there are challenges to ensure the volume of work is delivered safely, whilst maintaining a secure network and an efficient outcome for all stakeholders.
36. MD highlighted key strategic works, including: HVDC link (between Hunterston and the Wirral), series compensation to increase flow across B6 constraint boundary; Beaulieu – Denny route being up rated from 275kV to 400kV. The rate of the investment is determined by the amount of additional demand and generation added to the system.
37. MD highlighted the new Network Access Policy, this aims to ensure a clear policy in long and short term planning that is followed by both TOs. This aims to reduce in year changes to outages and improve planning efficiencies.
38. CMD queried whether a project was given an outage as soon as the financial investment decision was signed off. MD clarified rough time periods are contained in the RIIO T1 submission, and then is scheduled operationally. MD highlighted examples where work has been accelerated, to the detriment of the TO but to the benefit other stakeholders. This included highlighting the advancement of work to minimise the number of times a non standard connected generator would be disconnected without payment.
39. CMD noted the majority of assets have a two year lead time on delivery. Therefore TOs must plan their work at least two years in advance. CMD stated generators would benefit from having the information then, as similar lead times are required for generator assets. This would allow improved outage alignment. JD noted at the initial investment, the TO may limit planning to the approximate outage length, year and quarter of this outage. CMD recognised this but noted 2 years would be required to align financial plans for the TO and the generators. KD noted some long term outage plan information would be available in the OC2 reports from December, with more being available next year. MC noted it would be a big improvement to have visibility of outages beyond a year in advance.
40. MD noted there is plan for up to 8 years ahead, but there is a risk of there being too much data and not enough information. The aim is for information to be in a format that is clear and explains the impacts for both generators and DNOs.

41. SM stated was aware plans would change, particularly at last minute due to system conditions. However, gaining visibility the length and year of the outage ahead of time would allow appropriate financial planning.
42. MD noted that he could not capture impact to all stakeholders in the long term plan. This is considered at the 3 year ahead stage and agreed with project delivery. It is at this point they would look to align outages. MD noted that going forward he would look to execute an outage plan that may be less efficient for TO but more efficient for the network as a whole. The correct funding requirements are now in place to allow this to occur.
43. MC noted generators expected a degree of change in the outage pattern, understanding system incidents and faults are unavoidable. However, MC noted there should not be any large deviations for major projects. Would expect maintenance to change, but ideally these should be aligned with major projects. MD agreed stating there are now tighter controls on the change process, for within year alterations. To request an outage change a paper must first be submitted internally, to justify outage before submitting to the SO.
44. MD noted for those generators with non standard connections, you will be impacted, potentially severely due to the amount of transmission investment occurring. The aim is to provide good quality information so you will know when and how you will be impacted.
45. MM clarified whether a generator can ask for an outage to be rearranged, for example to coincide with a generator planned outage or a less windy period. MOC comment this summer there was nearly no synchronous plant in Scotland and Scotland has been importing power for the majority of the summer putting the system under stress. National Grid had been offering money for generators in Scotland to produce electricity and has been unable to contract with anyone and consequently had to withdraw system access.
46. SONI's concern with a 7 month outage to uprate the circuit, resulting in Moyle being unavailable for the duration were raised by EM. In Northern Ireland this outage would be rejected due to its duration and since Northern Ireland is so dependent on Moyle asked if there was a way of reducing the length of the outage? MD explained the outage was for line uprating caused by more wind farms wishing to connect to the circuit. They are currently investigating ways of allowing generation connected to the line to export during the period of the work. Due to the location of the line, the only option is an inline replacement and the line was longer than 100 tower spans resulting in a long outage. KD noted there was no cost driver for speeding the work up, as constraints this year were import into Scotland, Moyle as a large demand compounds this. KD suggested SONI and TO work together to reach a best compromise solution.
47. CMD asked whether particularly sensitive outages, such as this one, could be 'red flagged' and therefore cannot be changed. EM supported this, noting this outage will prevent any generator in Northern Ireland from taking outage for the entire outage season.
- 48. New ACTION 4: MD and MDa to investigate how to mark which outages would be flagged for stakeholder impact.**
49. MD covered several other examples where network outages had been particularly challenging. In these instances the aim to work with the customers as closely as possible and accommodate their concerns. One example, involved rescheduling the outage five times, to ensure two nuclear sites maintained supplies and the Argyll wind generation group could export maximum power on a windy day.
50. MDa highlighted in the SHE Transmission area predominately every line will either be reinforced or refurbished between now and 2021. This work would primarily have to be inline build, resulting in prolonged outages in some instances.
51. KD noted the Scottish National Planning Team, is aiming to go beyond a year ahead. Users should see some of the long term plan in the week 49 OC2 report, and then more the following year. When the plan is robust, will start agreeing them in TOGA and therefore generators will be able to see them. ITPR may result in an extensive restudy of the access plan, which could lead to significant volatility. KD asked generators to talk to the Scottish

National Planning Team before planning major outage to get an indication of the reliability of the information.

52. CMD sought clarification between the coordination of outages between SHE Transmission and SP Transmission. MD noted that the two companies worked closely together, particularly on schemes that have significant impacts on both areas – for example the Beaulieu – Denny. MDa highlighted a monthly catch to try and coordinate outage planning. Also, both companies have intentionally structured their planning teams in the same way to aid greater cooperation. KD highlighted the JPC operational assessment going forward, for work occurring 3-8 years ahead; refocusing on these timescales will hopefully improve shorter term planning.

### 3.2 Discussion

53. MD explained the Network Access Policy was an enhancement of the STCP, which was expanded to see how the document could be improved. It is a good engineering document that considers all stakeholders not just the TO or the SO. The aim is for the impact to be minimised on all stakeholders.
54. MD proposed a yearly forum like the round table meeting to go through a high level view of the plan and wider system impact. This could cover current year and the forecast plan for the following year so generators and any large demand customers fully understand the outages and any interactivity. MD stated this would include less detail on individual outages than what is contained in OC2, but present a wider picture. MDa supported this in principle but felt for SHE Transmission these discussions should already be occurring at project level. MDa would be willing to support this if it was something that could be accommodated easily.
55. MM, SM and CMD agreed the forum would be useful, particularly for smaller generator companies saving the burden of having to glean this information from the OC2 reports.
56. MOC suggested an ideal time for this meeting would be the end of January, after the issue of year ahead plan at week 48.
57. IK agreed National Grid need to clarify whether it would be possible to share the baseline plan more widely. This is different to what is currently done, where Users are only notified of the transmission circuit outages that affect them locally. Potentially sharing everything might encourage gaming. SM noted that gaming is illegal and Ofgem should have the mechanisms to monitor this rather than limiting useful planning information. IK agreed, but didn't wish to commit without full consideration of the issue.
- 58. New ACTION 5: IK to establish whether National Grid would have any concerns with a wider distribution of the yearly outage plan**
- 59. Post Meeting Note: National Grid would support the communication of the outage plan as discussed.**
- 60. New ACTION 6: Subject to National Grid's response that the forum would be an appropriate vehicle. MD and MDa to arrange and facilitate this outage forum for the end of January supported by National Grid.**
61. CMD and MC support the need to be careful regarding the sharing of information that could provide a commercial advantage, but also believe the forum would be useful place for ironing out any issues.

### 4.1 OC2 and STC outage planning processes, TOGA Overview and General Discussion

62. SM highlighted for those generators that are not transmission connected and are under a certain size there are limited processes for communicating outage that may impact them. These are also the generators who are likely to be more severely impacted by outages. MOC noted this would be a requirement of the DNO not the SO. In the worst case scenario when the only generation to control the constraint is embedded the TO would ask the DNO to restrict the output of the embedded generation. It is up to the DNO on how this is achieved.

In addition to this there will be constraints on the DNO network that the transmission network will not see. It was decided this was outside the scope of the meeting as the DNOs were not available to address the issue.

63. MOC highlighted a change to the BCA that he is looking to implement. This would involve replacing (or adding to) the descriptive wording about outages with a relevant diagram. This diagram would then highlight which circuit outages would result in a generator outage that would not be compensated. MOC is current engaging with the Customer Account Managers and Legal teams within National Grid to understand the impact of implementing this. MOC felt this would be clearer and aid understanding of the OC2 reports.
64. MOC noted this would still need to be updated with change to the connection, but the information would all be in one place. MOC further clarified that additional generators connecting to the same circuit; potentially changing the outage or constraint conditions would result in a Modification Application being issued and this would not change.
65. MOC also noted that he does not want to add more specific comments to the remarks field on the OC2 reports. While this may help interpretation of the OC2 reports, there are many circuits which impact many generators and would risk being able to see parts of each other's contracts. CMD noted the diagram would be the most useful, as this is the clearest way of communicating with field teams.
66. **New ACTION 7: MOC to investigate how to include diagrams in BCA. Already started to try sending into TOCO like this and then use for BCA.**
67. CMD felt there are two separate requirements around the communication of outages. Under OC2 notification of outages of circuits (standard naming) documented in the Grid Code. Also with the BCA 10.3 'company shall notify you of specific outage conditions', facilitated by the CUSC (generic requirement from the CUSC). This is two separate outage notification requirements both are not necessarily satisfied by the OC2 report process.
68. **New ACTION 8: MOC / KD to review BCA 10.3, however it was noted these clauses may be different between BCAs.**
69. ***Post meeting note clause -It is a condition of the GBSQSS that any variation to the connection design satisfies the criteria set out in paragraphs 2.15 to 2.18 of the GBSQSS and on that basis and in light of the non standard principles of ownership the following provisions will apply***  
***This is covered by the MOD notice process discussed in report and 64 above***
70. EF noted the email being sent to generators to inform them of a request to change an outage that impacts them may need to have the wording reviewed. EF appreciates the standard phrases but in at least once instance of seeking clarification of whether an outage was disconnection of mains supply or interactive for a period of time was open to interpretation. MOC asked for feedback of when these emails were not clear, this is currently something that is being implemented and any suggested improvements to the phrasing are appreciated.
71. EM noted the emails were not necessarily that clear for SONI to understand, particularly as SONI is informed of outages on various circuits that Moyle is not directly connected to.
72. **New ACTION 10: EM / MOC to liaise to identify the best way of communicating outage changes with SONI.**
73. CMD noted it is important to keep the BCA up to date, to facilitate understanding of outage plan and for other important conditions, such as fault levels – key for health and safety. It was agreed this is important and it was noted KD is trying to update all BCAs.
74. EF and MC noted it was only possible to understand the OC2 reports with significant experience. Portfolio groups have many BCAs to go through to find the circuit referenced in

the OC2 and understand how it would impact their generator. Hopefully the diagram would be an improvement, as long as these were maintained.

75. Another concern raised by MC and CMD was the outage time provided in the plan. All single day outages appear to have the generic time 08:00 until 16:00. Clearly not all outages can be switched at the same time, but to ensure the generator is not out of balance they have to submit a PN of zero – resulting in unnecessary lost output. Also, then do not know the finishing time, if starting late, may finish late – which again limits the ability to generate electricity.
76. CMD noted this is also not helpful for their staff management who may have to drive to a remote site in preparation for the 08:00 switching; if this does not happen until much later in the day they have wasted time. Also, from a safety point of view, driving in worse conditions unnecessarily. MC recognised that delays do occur, but they cannot all realistically start at 08:00.
77. MC proposed a dialogue between control rooms overnight to say what time they will be switching the following morning. NS noted a great deal of effort goes into phasing switching a couple of weeks before the outage. NS was not aware generators did not receive this information as it is uploaded into TOGA.
78. MOC noted that a manual notification would not be generated for a time change, as this is not a request. The TOs are able to change the time of their outages without requiring permission from the SO (they are unable to change the date).
79. MOC noted these updated times are available in the daily reports
80. MOC also highlighted, depending how each generator wishes to use TOGA there are several options to change the number of reports that generators receive. To do so contact MOC. MOC also said that once registered to use TOGA generators would be able to access the TOGA portal and therefore go and get the information at any time that suited them.

## 8 Any Other Business

81. CMD noted that did not feel additional code changes would be required at this moment, but would welcome the opportunity to feedback further after the changes have had an impact on the process.
82. MC felt last minute outages were actually dealt with quite well, longer term planning was where better communication was required.
83. Due to time constraints, any other business to be emailed to Mark O'Connor and Catherine Hiorns.

## 9 Summary of Actions

Action Number	New or Existing Action	Action	Action Owner
1	Existing	Review advanced notification of outage change email, this is newly implemented for this next year	SO
2	New	MOC and KD to investigate circuit diagrams inclusion in the BCA and e-mail notification e-mails.	MOC and KD
3	Closed	MOC to arrange training session to aid understanding of the OC2 reports.  <b>Post meeting note:</b> This was covered by MOC in the afternoon of this meeting. For any further queries please direct these at MOC. Therefore this action is now closed.	MOC
4	New	Investigate how to mark which outages would be flagged for stakeholder impact.	MD and MDa
5	New	Establish whether National Grid would have any concerns with a wider distribution of the yearly outage plan (Action Complete)  <b>Post meeting note:</b> National Grid would support the communication of the outage plan as discussed.	IK
6	New	Arrange and facilitate this outage forum for the end of January supported by National Grid.	MD and MDa
7	New	Investigate how to include diagrams in BCA. Already started to try sending into TOCO like this and then use for BCA.	MOC
8	New	MOC / KD to review BCA 10.3, however it was noted these clauses may be different between BCAs.  <b>Post meeting note:</b> -It is a condition of the <b>GBSQSS</b> that any variation to the connection design satisfies the criteria set out in paragraphs 2.15 to 2.18 of the <b>GBSQSS</b> and on that basis and in light of the non standard principles of ownership the following provisions will apply This is covered by the MOD notice process discussed in report and 64 above	MOC /KD
9	New	EM / MOC to liaise to identify the best way of communicating outage changes with SONI.	EM / MOC