Remittal Data Review

Final Report

Prepared for:

Ofcom

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1. CONTEXT

1.1. In March 2013, the Competition Commission (CC) determined that Ofcom had erred in certain aspects of its setting of the charge controls for LLU and WLR services on BT for the two year period from 1 April 2012 to 31 March 2014. The Competition Appeal Tribunal remitted the 'fault rates' matter to Ofcom for further consideration. One of the areas Ofcom was asked to focus on was "the causes of the significant differences in the Early Life Fault (ELF) rate in data provided by BT for the period pre- and post-January 2011 and the discrepancy between BT's data and TalkTalk's data in the period prior to January 2011."[1]

1.2. In particular Ofcom was asked to "consider whether the increase post-January 2011 has underlying causes or simply represents a change in fault classification".

1.3. BT had told the CC that there were underlying causes for the increase - in January 2011 there had been a significant change in the way that new Metallic Path Facility (MPF) lines were provisioned which resulted in the higher levels of early life faults reported post January 2011[2].

1.4. Ofcom requested and received further data from BT regarding LLU and WLR faults that occurred in the pre January 2011 period.

1.5. CSMG was engaged by Ofcom to review this data and determine:

- The reported level of ELF for Wholesale Line Rental (WLR) and MPF for the period 2009 through to 2013;
- Any evidence of inconsistency or error in the reporting of ELF; And,
- If there is evidence of errors, the potential scale of the error including, if possible, revised estimates of ELF.

2. METHODOLOGY

2.1. CSMG received 3 archive datasets ("the remittal data"). The most relevant data fields used in this analysis and characteristics of these archives are described below.

2.2. Archive 1 contained an Access database of faults for MPF and WLR/SMPF reported during the period April 2008 to January 2011, including ELF designations for some of these faults. An additional dataset (in Excel files) in this archive contained ELFs primarily from February 2011 to March 2011, with limited data in January and April 2011, though the ELFs for these datasets only included MPF and WLR3 faults (i.e. WLR Classic and SMPF were excluded).

2.3. Due to the differences in the quantity and quality of the Excel data and the Access database data within Archive 1, CSMG primarily used the broader Access database files for the analysis.

2.4. Archive 2 contained MPF and WLR/ SMPF faults between October 2009 and September 2011, along with the dates when these faults were received and clear codes detailing how the fault was resolved.

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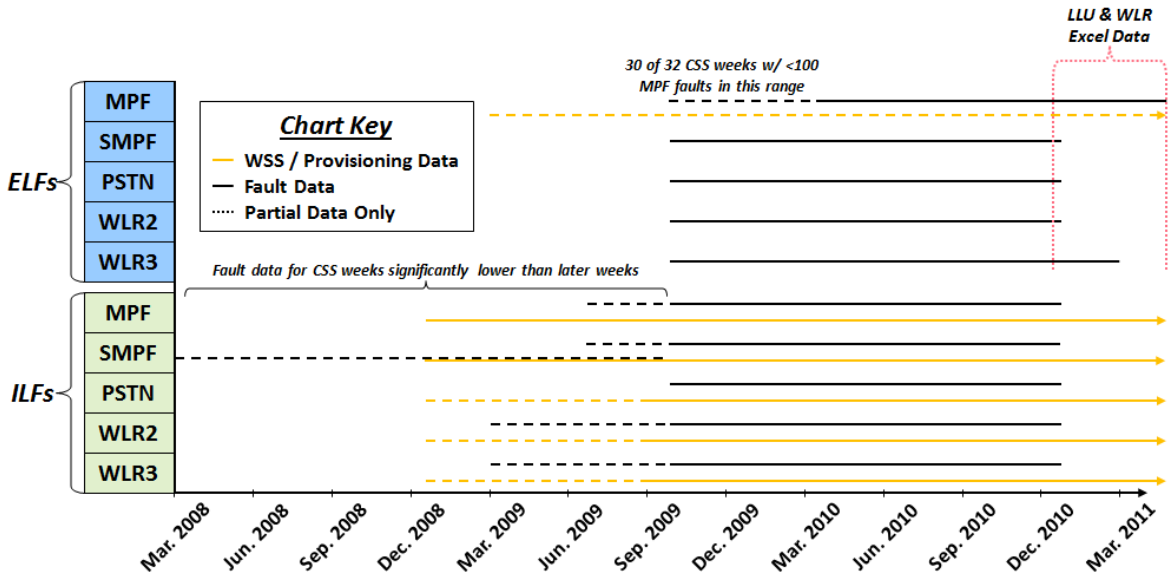
[1] Competition Commission - Determination British Telecommunications Plc v Office of Communications 27 March 2013, p 14-40

[2] Ibid, p 14-32

2.5. Archive 3 contained MPF and WLR/SMPF faults between April 2008 and March 2011, the clear codes for these faults, and the location of the fault (e.g., network segment).

2.6. Within these data sets there appeared to be some periods of incomplete data. For example, Archive 1 data appeared to be incomplete for the first year of this dataset, October 2008 to October 2009. This was also the case for various parts of Archive 2 and Archive 3. The figure below shows a graphical representation of periods of incomplete data vs. complete data.

Figure 1: Analysis of the Remittal Data Showing Time Periods Available by Product and ELF/ILF



2.7. There were a number of other limitations to the datasets used in this analysis:

2.8. As noted above, the datasets in Archive 1 contained fault data that was not comparable across files (e.g., the Excel data for WLR did not contain WLR Classic or PSTN, while the Access database data included those products). In addition, the majority of the Early Life Faults for the period of April – September 2010 were not flagged as ELFs in the primary Archive 1 database, leaving a gap in the overall data.

2.9. Because Archive 1 was the only provided dataset containing data for ELF volumes, Archives 2 & 3 were only useful insofar as they contained fields that could be appended to data found in Archive 1 to enable additional analyses and filtering criteria.

2.10. CSS Week labels also varied by archive on whether the CSS week assignment was based on when the fault was received, or when the fault was cleared in the system.

2.11. When the data in the Archives was re-assigned to CSS weeks by fault received dates, a subset of the faults (~20,000 - 25,000 for Archives 1 & 2; 1.4 million in Archive 3) occurred prior to Oct. 2009, and could not be used for this analysis.

2.12. Using the largest dataset found in Archive 1 as the "master" dataset for the fault analysis, approximately 37,000 faults could not be matched to records in either Archive 2 or Archive 3, and thus could not be included in the assessment of relevant faults based on Clear Codes. Of this subset of faults, over 21,000 had been flagged by BT as "OR Responsible" faults based on the "Access+" binary field.

2.13. The date ranges available in Archive 2 extended beyond the available data found in Archive 1, however faults in this additional period did not contain any field for determining whether the faults were ELFs or ILFs, rendering the data unsuitable for the analysis.

2.14. Using these datasets CSMG was able to calculate the volume of early life and in-life faults for MPF and WLR/SMPF lines between the period October 2009 and January 2011 (the period for which the most complete set of ELF and ILF data was available).

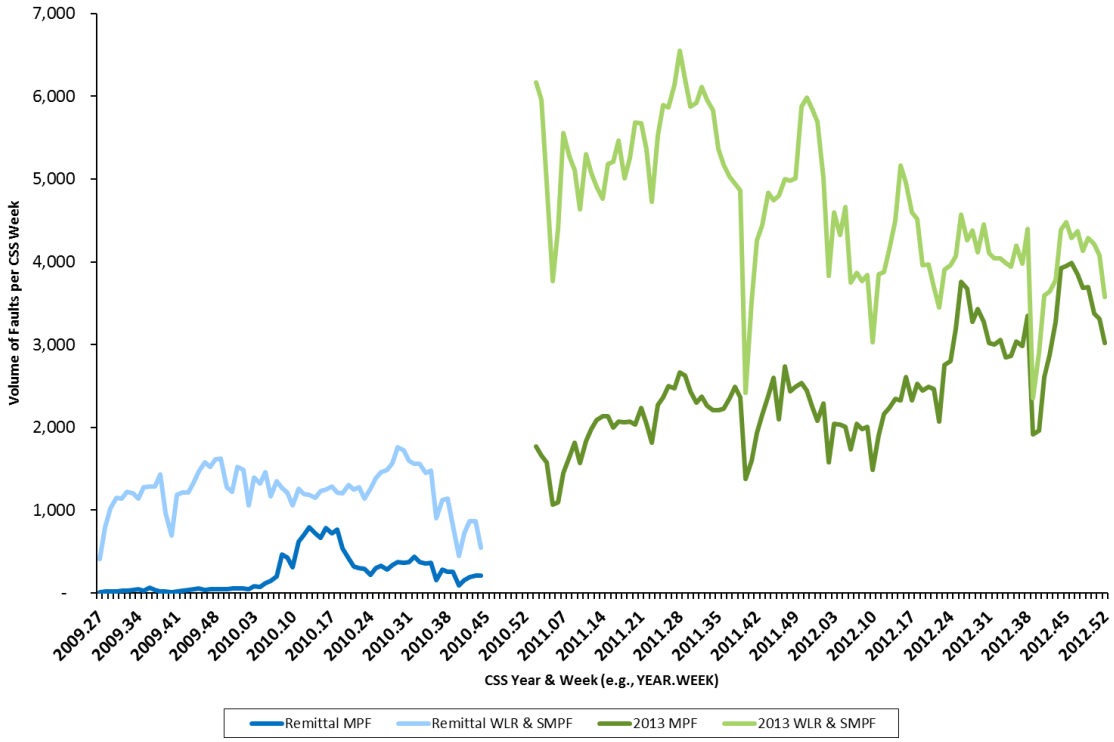
2.15. Using the Clear Code information in Archives 2 and 3, CSMG filtered out those faults which were not identified as OR's responsibility. CSMG used these same filters in its WLR and LLU Fault Rates Analysis report ("the 2013 report") which analysed fault rates from April 2011 to August 2013.

2.16. The application of the Clear Code filter determined 43% of the faults were not relevant for the analysis (~2 million records), leaving approx. 2.7 million faults over the Oct. 2009 – Jan. 2011 period.

ELF levels

2.17. The weekly results (by CSS week) can be seen below for MPF and WLR/SMPF lines. This shows the fault volumes for early-life for the remittal dataset (which covers the period from October 2009 (CSS week 27 of 2009) up through January 2011 (CSS week 44 of 2010), as well as the fault volumes from the 2013 report (which covers the period April 2011 to March 2013).

Figure 2: ELF Fault Volumes, Remittal Analysis & 2013 Report



2.18. The graph shows that the early life fault volumes in the 2013 report dataset are several times higher than those in the remittal dataset (10 times higher on average for MPF faults, and 3 times higher for WLR & SMPF).

2.19. In terms of rates, weekly early life fault rates[3] for MPF increased from an average of 0.2% across the remittal data set to 1.2% in the 2013 dataset.

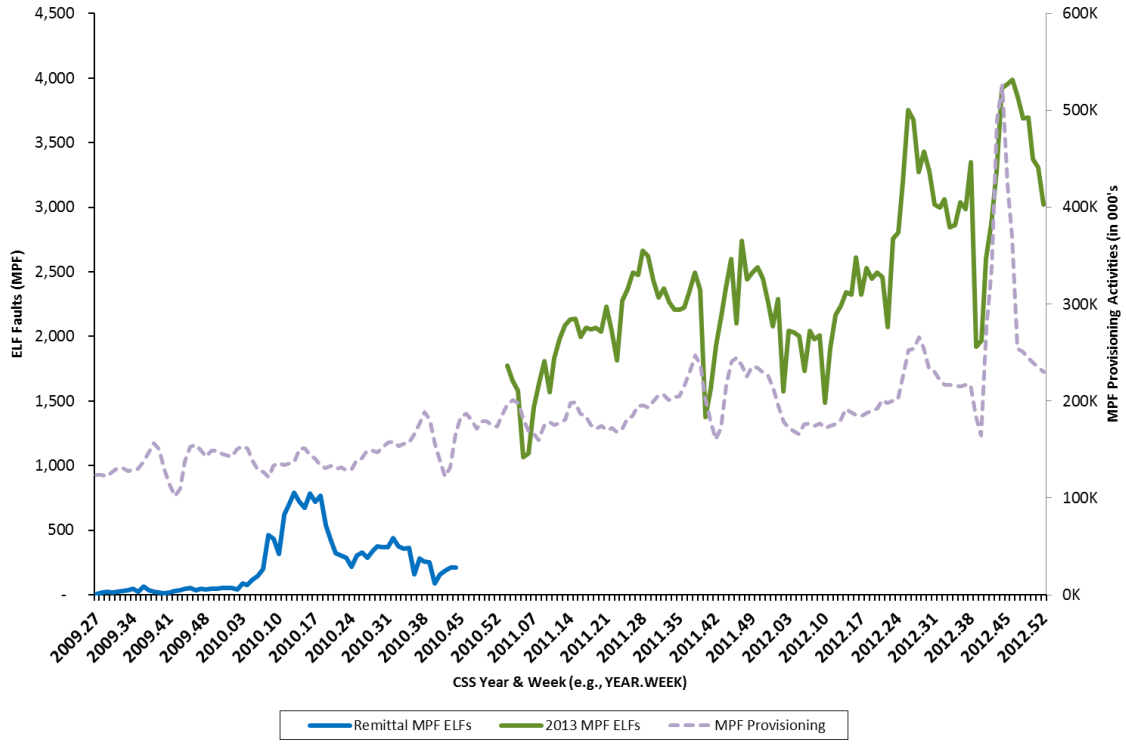
Understanding ELF levels

2.20. CSMG developed a series of hypotheses that might explain this:

- The level of provisioning activity increased and therefore early life fault volumes also increased;
- A proportion of early life faults were, for whatever reason, excluded from the remittal dataset; and,
- There was a change in the way that ELFs were categorised across the different periods of data.

2.21. CSMG assesses whether the increase in faults was the result of an increase in provisioning activity. An analysis of MPF provisioning showed that there was an increase in activity; however the increase was insufficient to fully explain the increase in fault volumes. Whereas MPF early life fault volumes increased by 10 fold over the period in question, MPF early life lines[4] only increased by 0.7 times.

Figure 3: MPF ELF Volumes vs. MPF Provisioning Activity

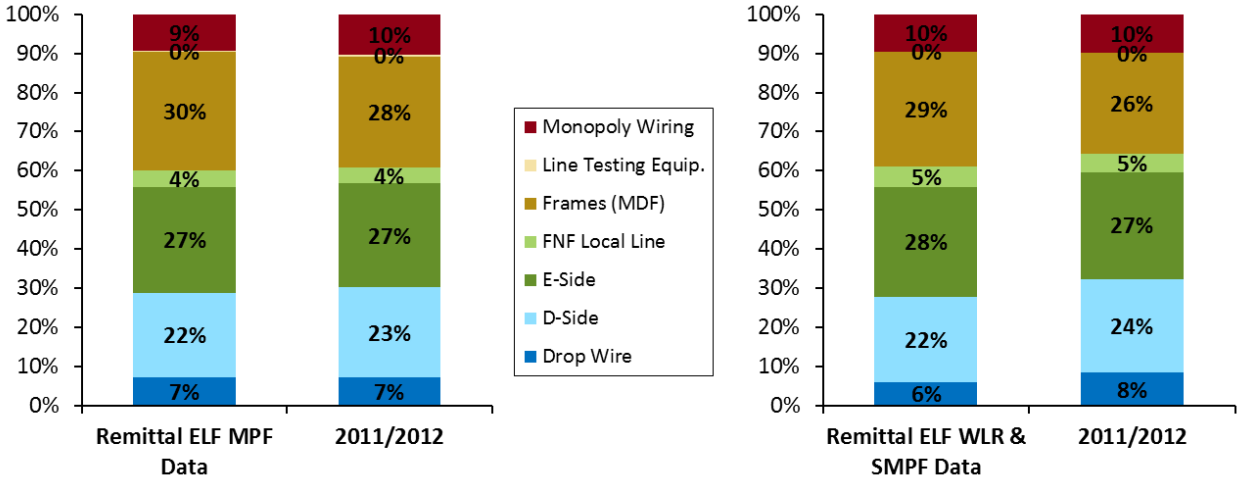


[3] Early life fault rates are calculated by dividing the total number of MPF faults in the data by the estimated number of provisioning activities during the week. Provisioning activities allocated weekly based on weekly distribution in CSS year 2011, applied to recorded monthly provisioning activities.

[4] CSMG estimated monthly provisioning activity volumes for the period October 2009 to March 2011 using annual provisioning volume data from the Ofcom 2012 Charge Control model

2.22. CSMG also assessed whether ELFs from a particular network segment had not been captured or reported in the remittal dataset, resulting in an abnormally low number of ELFs during this period. To test this, CSMG conducted an analysis of the distribution of early life faults across network segments in the remittal dataset and in the 2013 report dataset. The output can be seen below. The distribution of faults stays roughly consistent between the datasets and therefore does not suggest that ELFs from any particular network segment were under-reported.

Figure 4: ELF Distribution by Network Segment, Remittal Analysis & Report Data



2.23. Finally, CSMG investigated whether there had been a change in the way that ELFs were categorised. In particular, CSMG wished to assess whether any faults that were categorised as early life faults in the 2013 report dataset were categorised as in life faults in the remittal dataset. An analysis of ELF and ILF volumes for MPF and WLR/SMPF products was conducted and the results are shown below.

Figure 5: Early Life and In-life MPF Fault Volumes (Remittal data and 2013 report data)

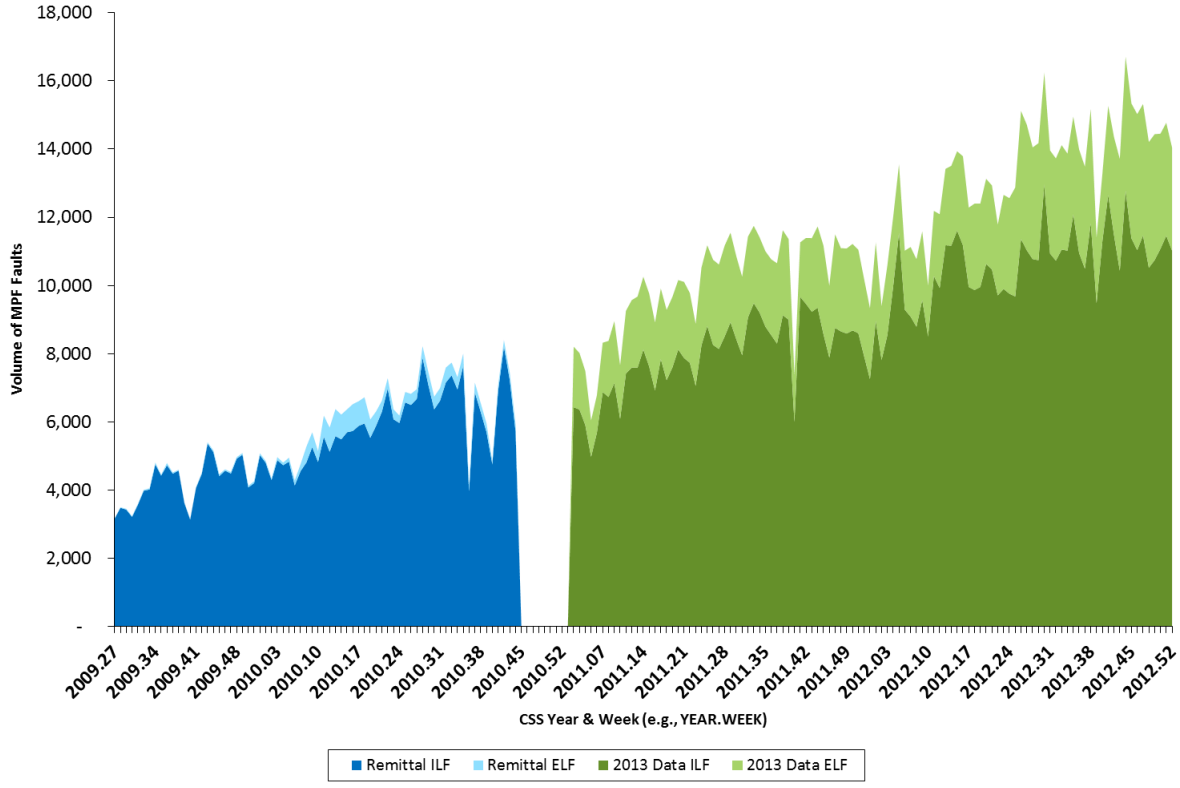
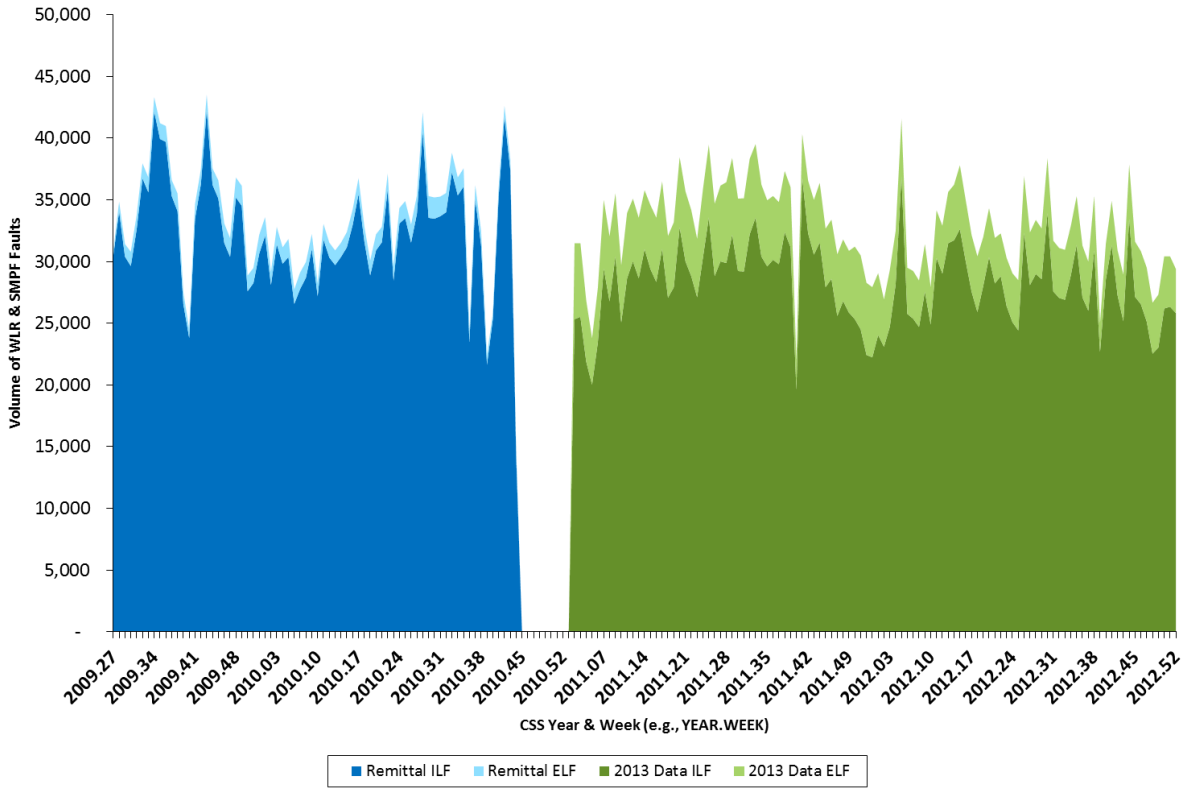


Figure 6: Early Life and In-life WLR/SMPF Fault Volumes (Remittal data and 2013 report data)



2.24. The graphs show that, between the time period contained in the remittal data set and that in the 2013 report, the level of total faults (both ELF and ILF) was either increasing gradually (for MPF) or roughly similar (for WLR/SMPF). However both graphs also show a much higher proportion of early life faults in the 2013 report vs. the remittal data. This suggests that the early life fault categorisation is different between the two datasets and that faults which would have been categorised as early life in the 2013 report dataset may have been categorised as in-life faults in the remittal dataset.

2.25. BT later noted that there was, in fact, as far as they were aware, one change in the method of fault categorisation between the Remittal data and the data used in the 2013 report[5]. BT explained that the early-life faults in the Remittal data were only classified as such if the fault required engineering activity to fill the order. In the latter period, an ELF would be documented even when no engineering activity was required. This change in categorisation confirms CSMG's analysis of the datasets, that the reporting of ELF varied between the periods. However, it is not clear whether there were other differences in categorisation.

[5] Email from BT to Ofcom dated 9th December 2013

3. CONCLUSIONS

3.1. In summary CSMG's analysis found that the ELF volumes and rates were much higher (aggregate ELF volumes approx. 5 times higher, MPF ELF rates nearly 7 times higher) in the 2013 report dataset compared to the remittal data set.

3.2. CSMG did not find evidence of error in the calculation or reporting of early life fault volumes in the remittal dataset.

3.3. However there was evidence to suggest that the early life fault classification was not the same between the data sets, resulting in a significantly larger number of early life faults in the 2013 report dataset.

3.4. This corroborated with the explanation that OR gave for the difference in volumes and rates; there was indeed a change in early life fault classification between the datasets.