line. This fault has cost three handsets, three visits (to rural areas), three overhead costs, and still we didn't fix the problem.

LIGHTNING

Many areas claim to be a "high lightning" zone. However, no one ever defines what they mean by "high" lightning - how many hits do they mean; once a day, or once a year, or how often?

What has been found is that areas in this category have an odd approach to solving it. They put in more and more EJs in the belief that they need to open the cable more often to quickly isolate the faults ! Given the above findings on jointing quality and the number of earth faults present in any EJ, the last thing needed in lightning areas is more EJs.

Lightning has only one purpose in life - find earth. So in order to fix lightning damage quickly, our people are installing more targets, so they get hit more often, so they install more targets (EJs), so they get hit more often - where do we stop ??? Of interest is that these areas rarely use correct earthing techniques on their Moisture Barriers at these EJs !

Correctly installed cable, with an absolute minimum of Elevated Joints, and fault free, will attract minimal lightning strikes. And even those few hits can be isolated to a given area where our Engineers are quite capable of designing appropriate protection. ANY AREA WHICH CLAIMS TO BE A HIGH LIGHTNING AREA, IS ADMITTING TO POOR MAINTENANCE PRACTICES.

SUMMARY

The existing rural CAN is in very poor shape. The transmission group has not kept to the original plan of specialising in transmission type problems because the number of DC faults has reached epidemic proportions.

Almost every rural customer has a fault of sufficient severity to degrade their service and many are even outside the limits which we classify as "unworkable".

All customers beyond the 6.5 dB point have very poor transmission problems, and all those who have a T200 handset have major sidetone worries.

These faults are all systemic in that the source of the problems can't be traced to any common action(s). To further compound the problem of CAN transmission in rural areas, it is useless performing any testing until all DC faults are cleared.

Design errors make the maintenance function extremely difficult, even to the point of guaranteeing that faults are never repaired.

Local maintenance practices have degenerated into a process of transpose around the fault, and where that is no longer feasible, replace a length.

There is absolutely no logic or reason applied to preventative maintenance, but there is strong evidence of "near enough is good enough". AND THAT JUST ISN'T GOOD ENOUGH.

QUESTIONS & PROBLEMS

1. What is the real level of knowledge for our external plant staff ? Can they be trained or developed to the higher standards required ?

To simply supply better test equipment and provide training has failed. Many of the instruments which have been supplied are left in vehicles and never used, old techniques are still the norm. Attitudes haven't shifted.

2. Do our external staff UNDERSTAND the principles involved in transmitting a telephone signal across copper pairs ? Are they capable of gaining the required level of understanding ? Given that we are now a different company, focused on service, and aiming to operate on a leaner staffing profile, should we look for a lower number of more highly skilled field operatives ?

3. Whilst we can address the future design matters to ensure that the mistakes of the past don't continue, how should we correct those that are already in place ?

4. Should pure, applied transmission testing be centralised within a specialist group, or decentralised to the depots ? Given the current performance, local depot control has been an abysmal failure. But if we create a specialist group, how do we separate the transmission faults from the regular DC type faults - the two are very much interconnected.

5. How do we stop the proliferation of transpositions which are used as an alternative to fault finding ? How do we correct the damage that has been done ? The practice is so widespread that just to stop it happening in the future will demand a major effort, and that won't even address all the cables which are currently messed up.

6. Should cable replacements be shifted to a centralised group ? The vast amount of unnecessary work which is being completed simply as an alternative to correct fault finding/repairing techniques, demands that we alter the present method - but to what?

The examples that have been found during the last three months strongly suggests that local depot control is totally unsuitable. Alternatively, any system whereby an "outside expert" needs to go and double check is remarkably like rework !

7. Given that existing cable plans are greatly incorrect, how do we go about fixing them ? If the current plans are down loaded into CPR, then we are starting this new system from a disadvantaged position.

Staff have complained for years that the plans are incorrect, whilst drafting sections have been screaming for updated information from the staff - we are now paying the penalty for not sorting out this communications problem, and we're doing so whilst downgrading the size of our drafting sections.

WHAT MUST BE DONE

Design of new cable routes, or major re-designs must concentrate on ease of maintenance, rather than low cost of installation. (rated as easy to achieve and with only slight increases in additional labour resources, and material costs).

Existing areas must be reviewed for better designs. (rated as difficult, and using at least 2 additional design staff across the Region).

All replacement cables must be checked by a specialist, skilled person and checked by a designer to ensure conformity with operating parameters. (rated as average difficulty level, and moderate additional labour).

Cable replacements must come under the control of the design group. This will ensure correct priorities are met, and the most cost effective long term solutions are used. (rated as easy, and nil additional labour).

Transpositions must be banned as a fault correction method. The real cause of the fault must be actually rectified. (rated as extremely difficult to achieve, but reducing labour needs in the medium to longer term).

Staff need to undergo an attitude change concerning their approach to working in the rural CAN. (rated as very difficult, but if successful, will reduce staffing needs).

Skill levels of rural CAN staff must be raised quite significantly. (rated as difficult, but offering a reduction in labour resource).

A specialist transmission section needs to be established within each area, to act as consultant experts. (rated as easy to do, and using perhaps 10 to 12 units of labour across the Region).

If CPR is to have any chance of working, the current plans need to be greatly upgraded. (rated as difficult to achieve, and very labour intensive)

RECOMMENDATIONS

The transmission group is consuming the majority of its time clearing DC type faults. This prevents them focusing on their original objective. Therefore, it is recommended that the process be altered to:

Approx one month prior to the transmission group testing a particular SCAX, the local depot should be advised and requested to remove all transpositions, all DC faults on both working services and spares, and dig/repair faulty lengths.

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The transmission group will then test and correct all long lines, all sidetone problems, and nominate joints which need to be replaced with in-line joints.

Each Area Manager should create a specialist cell (size will depend on area covered) of both external plant and technical staff who will take responsibility for all transmission faults. They should be trained in all facets of "the transmission of an analogue telephone signal" and supplied with a full kit of test instruments. All faults which cannot be tested and identified by the normal test process should then go to this cell for analysis.

The physical work performed by the group should specifically exclude DC type faults. That is; if during their testing, they find (as is inevitable) a cable route which has DC faults, it should be returned to the normal fault depot AND THE CLEARANCE OF THE ORIGINAL REPORTED FAULT SHOULD NOT TAKE PLACE UNTIL SUCH TIME AS THE CUSTOMERS PROBLEM IS SOLVED.

Of course the danger with this is that when under pressure to clear faults, history tells us that staff will try anything such as, transpositions or change of handset. If the clearance is to be delayed, it is most likely that staff will be motivated to increase the number of 'placebo' clearances.

A solution to the transpositions is to require a cable replacement request for any fault cleared as "KOOD or KOOF". Given that al cable replacement requests would be going to the CAN Development group, any erroneous ones will soon be picked up.

All cable replacements should be the responsibility of the CAN Development Branch. In making the decision on replacement, only this group have full access to future plans and Design Engineers.

Should a cable be deemed as not needing replacement, the fault should be returned to the local depot for repair.

The local transmission cell should also act as consultants in the identification of faults and in the overall fault repair quality.

FAILURE TO ALTER THE WAY WE ARE PRESENTLY OPERATING WILL SEE OUR EXPENDITURE RISE TO CRIPPLING LEVELS -

If we always do what we have always done, we will always get what we have always got !!!!

For further information, call

[redacted]

[redacted]

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