ENGINEERING MEMO

Initiated by:	Dave Emrich
Project Manager:	Tom Booler

Proposed Priority: ☐ Fast Track ☒ Normal

Title: Re-terminating damaged RG-6 and LMR-400-75 DoC cables

Affected item(s):

A small number of the MWA tiles at the MRO.

Technical description:

When the MWA array was changed from Hex configuration to Long base-line configuration in mid 2017 and the original long base-line tiles from 128T were re-commissioned, two of the tile cables were found to have chewed/damaged outer jackets within approximately 5m of the tile-end of the cable.

There was sufficient excess length on the drums at the receiver to allow us to drag enough cable towards the tiles to be able to cut off the damaged section of cable and re-terminate the new ends. However several extra metres of cable had to be cut off, because the damage had permitted water to enter the outer jacket and "wick" along the coaxial braid wires. This in turn led to corrosion of the braid and aluminium layers on the outer conductor of the coax cables. This corrosion can be easily identified as the braid wires and foil become grey and powdery instead of both being bright and shiny metallic.

The important point that has led to this Engineering Memo is that is it NOT SUFFICIENT to just cut back to the point of the damage, if the outer jacket has been compromised in such a way to expose the coaxial outer braid. Also, it is important to measure exactly how much cable was removed, since it will affect the calibration of the instrument.

However in order to avoid cutting off too much cable, or having the off-cuts in too many pieces, it is necessary to be able to determine where the wicking & corrosion has stopped. The easiest way appears to be to gently flex the cables and listen for crackling sounds from within the cable as the corroded metals move around. Once there is no further cracking sound upon flexing, a further metre should be allowed before making a complete cut of both polarisations of coax, then stripping the cable ends to be re-terminated. If there is still ANY evidence of corrosion on either coax cable, another further metre must be cut off and the process repeated until completely clean shiny metallic braid parts are exposed on both coaxes.

Remember: do NOT cut the drain wire back at the same length, it needs to be about 50cm longer than the coaxes, but its length is not important for instrument calibration so any off-cut drain wire can be dumped without being measured.

Once the cable is re-terminated and proven to work, the M&C manager must be advised of the amount of cable cut off, to allow the change in electrical length to be computed and the instrument configuration database updated. Test observations will allow final correction of the cable-length calibration in the system.

Effective Date: (dd-mm-yyyy)	2018-01-01
Reason for given effective date:	This knowledge was gained during the latter half of 2017 and applies from now on.
Expected impact on cost ($AUD):	Nil
Impact on schedule:	Minor, since the amount of time taken to identify where the cable becomes “good” again is reduced compared with blindly chopping one metre at a time.
Other impacts:	None apparent.
Attached Document(s):	

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