MEMORANDUM

From	**:**	S. Procter	**Document Ref**	**:**	AEP_MEM_128
To	**:**	AATSR Users	**Date**	**:**	23 February 2007
			Issue	**:**	A
			File ID	**:**	AEP_MEM_128.doc

SUBJECT   : User Note on Meteo Product Comparisons Report

A verification of the BUFR form of the AATSR Meteo product was conducted, in accordance with the AATSR long-term algorithm verification plan. The comparison report, **AATSR Technical Note: Verification of the BUFR form of the Meteo product, A. Birks, October 2006**, is provided as an attachment to this note.

The BUFR form of the Meteo product is derived from the PDS product by a format conversion. Therefore the contents of every field in the BUFR and PDS products from one orbit should be identical, within the limits imposed by the precision of the BUFR conversion. The comparison considered Version 1.11 of the BUFR software.

A total of 10 orbits with both the PDS and the equivalent BUFR product available were identified. The products were subjected to detailed comparisons, using an ASCII conversion of the BUFR product supplied for this purpose. It was noted upon completion of the comparison that these ASCII files was not entirely able to accurately represent the BUFR products, and some reported losses of precision were due to the ASCII file and not a feature of the BUFR conversion. These were not regarded as significant discrepancies.

The investigations found that the time and pixel number fields always agreed between the two products, as did the latitude and longitude fields. Other fields are discussed in greater depth in the report, and the main findings are summarised below:

1. Brightness Temperature Fields

Presented in the PDS product as integers in units of mK, the BUFR conversion divides the brightness temperatures by 1000 to convert units to K. However, the BUFR field is rounded to two decimal places, and automatic verification confirms discrepancies of ±5mK, consistent with such rounding. This loss of precision has been quantified, with a worst case standard deviation of 0.0289K. However, this has been deemed acceptable and is in accordance with requirements for Numerical Weather Prediction.

2. Confidence Word

According to the specification provided for the conversion, the treatment for this quantity is to reverse the order of the flag bits. The comparisons show that the extracted BUFR word is equal to the bit reversal of the least significant byte of the first half-word:

        PDS   [12, 0]   0000 0000 0000 1100

        BUFR   48   0000 0000 0011 0000

3. Mean Across-Track Pixel Number

Comparisons showed agreement between the BUFR and PDS values, apart from a few instances where the BUFR product contained an exception value, whereas the PDS product had a nominally valid value of 511. These occurrences are rare, and as the BUFR conversion flags these values as invalid, it is not substituting erroneous values. This issue will be raised with ECMWF for corrective action to be taken.

The conclusion of the report is that, with the qualifications above, the BUFR form of the Meteo product has been verified.