3GPP TSG_CN **Tdoc NP-000372**
Plenary Meeting #8, Dusseldorf, Germany
21st – 23rd June 2000.

Source:	**Vodafone AirTouch**[1]
To:	**GSM Association** **GSM Association BARG** **GSM Association IREG** **GSM Association TADIG** **GSM AssociationTWG** **EICTA IPC CCIG**
Title:	**Proposed Liaison statement on expansion of the IMEI coding scheme**
Agenda item:	**6.6**
Document for:	**APPROVAL**

The problem
3GPP TSG Core Network has been studying a problem which a member company raised: the expected exhaustion in the near future of the IMEI coding scheme. The IMEI is defined in GSM and 3GPP specifications to consist of a 2-digit Type Approval Code (TAC, which defines the Type Approval authority), a 6-digit Final Assembly Code (FAC, which defines the manufacturer and the production batch) and a 6-digit serial number (SN). All digits are decimal. This allows a maximum of 1,000,000 distinct IMEIs for a given combination of TAC and FAC. With the explosive growth in handset manufacture, 1,000,000 handsets is less than 1 month's production.

A possible solution
TSG-CN Working Groups 1 and 4 took it as a ground rule that the lengths of the TAC, the FAC and the SN (and hence the length of the IMEI), cannot reasonably be changed. Hence the only way to allow more serial numbers for a given combination of TAC and FAC is to allow the use of non-decimal digits in the SN. Each digit is carried in 4 bits, so in principle a serial number of 6 hexadecimal (base 16) digits could be used, to allow 16,777,216 serial numbers for each combination of TAC and FAC. Protocol limitations prevent the use of hexadecimal digit F, so the effective base is 15, which allows 11,390,625 serial numbers for each combination of TAC and FAC.

It would be necessary to modify the relevant specifications for all releases of GSM and UMTS back to GSM Phase 2, in order to ensure that a mobile station which sends an IMEI containing non-decimal digits to an earlier phase network is not rejected. However we recognise that besides the protocols which CN defines, the use of non-decimal digits in the IMEI could have significant impact on systems and protocols which are defined by technical bodies in the GSM Association, or which are developed for specific network use; it would therefore be necessary to specify a date (the cutover date) after which the mobile station can safely assume that the network infrastructure has been updated to accept non-decimal digits in an IMEI.

TSG-CN believe that network equipment which uses the specifications produced by TSG-CN could be made available for installation in networks in 2 years from the approval of the CRs to 3GPP specifications. The committees to which this liaison statement is directed are asked to give guidance on what they see as the appropriate cutover date to include in the 3GPP and GSM specifications which define the IMEI coding scheme, taking into account the various systems and protocols which use and transport the IMEI. It would be helpful if the GSM Association could co-ordinate the responses from its various technical committees.

An alternative solution
After the study in TSG-CN Working Groups 1 and 4, the possibility of a restructuring of the IMEI (while maintaining the same overall length) has been raised. This would reduce the danger of exhaustion of the coding scheme by increasing the length of the SN field and reducing the length of one or both of the TAC and FAC fields, while continuing to use decimal digits. The restructuring of the IMEI is outside the control of TSG-CN, but we will monitor developments, to see whether it would be possible to avoid the use of non-decimal digits in the IMEI while gaining an increase in capacity.

---

[1] Contact: Ian Park, tel +44 1635 673 527, email ian.park@vf.vodafone.co.uk