American Telecommunications Certification Body Inc.
6731 Whittier Ave, McLean, VA 22101

October 17, 2003

RE: Nokia UK Ltd.

FCC ID: QFXNHM-10X

After a review of the submitted information, I have a few comments on the above referenced Application.

1) Please provide an additional photograph with the second sub-shield removed (page 6 of 8 in the Internal Photos exhibit).
2) The 731 form lists GSM frequencies for AMPS band as 824.2 - 848.2. It is our understanding that this should be 824.2 - 848.8 which does also match the test report. Please explain.
3) For purposes of correctly listing information on the grant, is this phone a dual-band or tri-band. Note that the theory of operation mentions dual-band Cell phone, but section 2 of the EMC report states tri-band. Please explain.
4) It does not appear that the DC voltages/currents applied into the several elements of the final radio frequency amplifying device for normal operation over the power range as required by 2.1033(c)(8) are listed. Please explain where this information is located, or provide this information separately.

Bluetooth Report

5) The highest emissions shown in the plots in section 8.2 & 8.8 do not appear to be listed in the final data. Please explain.
6) It is not certain how the 232 hops in 31.5 seconds was obtained in section 8.6 of the test report. Note that if the device has 79 channels and occupies each for 454.909820uS, that this equates to a period for TX on all 79 channels of about 35.938 msec. Therefore in 30 seconds, the device will occupy a channel for 30/period of 834.8 times in 30 seconds. 834.8* TX duration measured is 379.7 msec. Please explain.
7) Typically for narrow band emissions given in sections 8.8 of the report, the average to peak measurements made on this type of device are 0 to only a few dB difference. The delta between the peak and average is typically on the order of 15 dB or more. This suggests that the device was transmitting in a frequency stopped pulse mode of operation instead of a CW signal that is expected according to FCC measurements on this type of device. Due to variances in average detectors, FHSS systems or any type of pulsed wavefore are mathematically corrected for the average measurement instead of actually providing measurements during pulsed modes. Otherwise any average measurements employed must assure that the RBW > 1/TX on time. Given that this device uses Bluetooth, the theory may actually be applied for these measurements. Note that Bluetooth has different packet lengths that may be used in modes with longer packets. The theory of operation for Bluetooth states that their may be 1, 3, or 5 slots used per transmit depending on the mode of operation. For a DH1 packet the TX is on 0.625 us per 49 mS per channel, while for a DH5 packet the TX is on 0.625 * 5 per 247 ms per channel. These duty cycles equal the following: 20 log (.625/49) = 37.9 dB or 20 log (3.125/100) = -30 dB. All modes are greater than the 20 dB difference between the peak and average limits. Given the acceptable nature of bluetooth duty cycles, you may apply this justification for these measurements. Alternatively, you may simply provide a statement in the report that peak measurements met with average limits without actually showing any average measurements since this is the case. Please comment and/or correct the report as necessary.
8) Similar concerns are noted regarding section 8.9 of the report. It is recommended to apply the mathematical correction vs. actual measurements.

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Part 22/24 Report

9) The prescan results show in section 8.2 amd 10.2 appear to show results significantly above the limits. Please explain.

SAR Report

10) The FCC asks that the SAR laboratory re-measure the peak power to ensure that the device is fully functioning during the SAR test at maximum TX power. Reported power results appear to be identical to EMC EIRP reported values. Conducted power appear to be given in the SAR report page 14. However, were conducted measurements made during EMC testing? What assurance can be provided that the device was functioning correctly at full maximum power during the SAR test.
11) Are full test configuration photographs available? If so please provide.
12) Review of the users manual lists multiple accessories (LPS-3 Inductive Loopset, HDC-5 Headset, HDE-2 Headset, HDD-1 Headset, HDC-10 Headset, and HDB-5). However it appears that only the HDE-2 Headset was tested. Since not all combinations have been tested, a justification must be made as to the determination of the worse case configuration(s).
13) The SAR Phantom description (section 4.2) should include relative thickness and tolerance information.
14) The FCC asks that the liquid dielectric parameters should measured at device mid-band frequencies. It appears that for the Part 24 band that these were measured at 1900 MHz vs approximately 1880. Please provide this missing information.
15) What was the probe tip distance to phantom inner surface during course scans?
16) The Distance between the measurement point (distance + offset) at the probe sensor location (geometric center behind the probe tip) and the phantom surface should be less than is < 8.0 mm and maintained at a constant distance of +/- 1.0 mm during an area scan to determine peak SAR locations. From reviewing the Z-axis scan for RH Tilt, it appears that the distance of < 8.0 mm might not have been achieved (appox 6 + 2.7 mm > 8.0 mm). Please explain.

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The items indicated above must be submitted before processing can continue on the above referenced application. Failure to provide the requested information may result in application termination. Correspondence should be considered part of the permanent submission and may be viewed from the Internet after a Grant of Equipment Authorization is issued.

Please do not respond to this correspondence using the email reply button. In order for your response to be processed expeditiously, you must submit your documents through the AmericanTCB.com website. Also, please note that partial responses increase processing time and should not be submitted.

Any questions about the content of this correspondence should be directed to the sender.