This document cross-references FCC 80.213(h) requirements to information in two compliance reports for the same device as tested to international standard ITU-R M.824-2 'Technical Parameters of Radar Beacons'.

The two TUD SUD reports are referenced in this document and listed below.

Referenced herein as	**Document Reference Number/Date and Source**	**Document Title** ***Exhibit Filename***
Report A	75931125 Report 01 Issue 2 April 2016; TUV SUD	Report On Radio Testing of the Linwave Technology Ltd LW26 RACON, In accordance with LW26-70118904 Transponder Qualification and Compliance Test Plan ***21817 Report; 75931125 Report 01 Issue 2_Radio Testing.pdf***
Report B	75931125 Report 01 Issue 2 April 2016; TUV SUD	Racon Variable sensitivity and side lob suppression Report ***21817 Report; LW26-70118918 Variable sensitivity and side lobe suppression report_sign.pdf*** (Note that this document is a scanned image and not searchable test.)

Listed below are the specific requirements and clause references to the aforementioned reports.

FCC Rule Requirement 80.213(h) ***ITU Comparable Requirement***	**Summary**	**Report and Clause Citation**
(h) Radar transponder coast stations using the 2900-3100 MHz or 9300-9500 MHz band must operate in a variable frequency mode and …	Reported measurements show sensitivity of -50 dBm triggering a response on the same frequency*.	Report A, clause 2.12 FREQUENCY ERROR
… respond on their operating frequencies with a maximum error equivalent to 100 meters.	See detailed response below this table as this requirement deviates from the international standard.	Report A, clause 2.13 DELAY AFTER RECEIPT OF INTERROGATION
Additionally, their response must be encoded with a Morse character starting with a dash. *Limit Clause ITU-R 824-2 Annex 4 Item 2*	Reported timing measurements confirm the transmission of a Morse character (letter D) which starts with a dash.	Report A, clause 2.14 MORSE CHARACTERISTICS
The duration of a Morse dot is defined as equal to the width of a space and 1/3 of the width of a Morse dash. *Limit Clause ITU-R 824-2 Annex 4 Item 2*	Reported measurement confirms the Morse dot time is 1/3rd the dash time.	Report A, clause 2.14 MORSE CHARACTERISTICS, 2.14.16 Test Results; recorded time-domain plots detail dash/dot timing.
The duration of the response code must not exceed 50 microseconds. *Limit Clause ITU-R 824-2 Annex 4 Item 2*	Reported measurement of total transmission time is 37.79 µs for each band.	Report A, clause 2.14 MORSE CHARACTERISTICS, 2.14.16 Test Results

*Frequency resolution is given as 1 MHz increments known as bins. The report notes this at clause 2.12.6 in the last paragraph.

Report B contains additional measurements, including receiver sensitivity and side lobe rejection, that may be of interest.

Regarding Maximum Error Equivalent to 100 meters

On 75931125 Report section 2.13 the response delay is measured at 0.691us. That would equate to a position offset of 103.65m. With the radio energy traveling at the speed of light, that would be like the radar bouncing off of a surface 103.65m behind the RACON. The divide by 2 in the formula below is because the radar energy bouncing off the object would have a round trip between the object and RACON, so half of the delay time is allocated to the trip to the object and half of the delay time is the trip back from the object.

See standard ITU M.824-4 in Annex 1, Table Technical parameters for a maritime racon, table item 4, sets the response delay for a Maritime RACON to be "normally not more than 0.7µs" maximum (105m). Therefore, the FCC 80.213(h) requirement of 100 meters deviates by 4.8% from the international standard.

$$d = \frac{c \times t}{2}$$

$$103.65m = \frac{3 \times 10^{8} \frac{m}{s} \times 0.691 \times 10^{-6} s}{2}$$

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