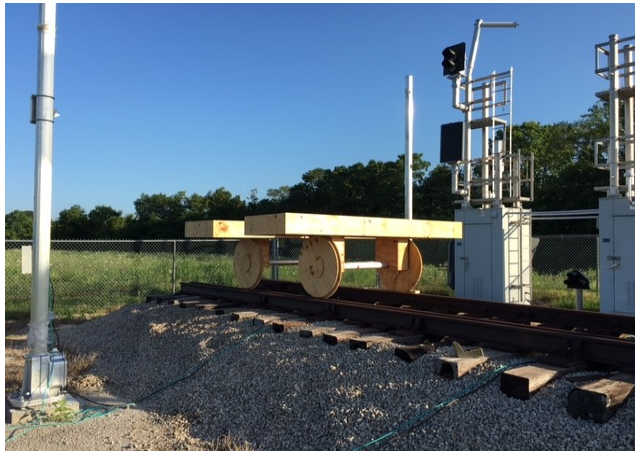


1. Jeff Fries, 2712 South Dillingham Rd Grain Valley MO 64029, 816-650-4320, jeffrey.fries@alstomgroup.com
2. Requesting a STA to allow temporary evaluation of a 77GHz radar kit from Texas Instruments (IWR1642BOOST) for a potential train detection application at railroad crossings. Current technology used today for train detection at railroad crossings uses either track circuits or axle counters. Both solutions require connection of equipment to the rails, which are subject to vandalism at ground level and/or damage by track maintenance equipment. Both solutions are also susceptible to reliability issues caused by environmental conditions (eg rain, snow, magnetic fields, etc). US railroads are looking for more modern technologies to replace these solutions with something that does not require connection to the rails and is immune to vandalism, damage and reliability issues caused by environmental conditions. The 77GHz radar technology proposed for evaluation appears to nominally meet all of the technical requirements necessary for train detection at railroad crossings. The STA is requested to evaluate further its capability, particularly the ability to provide immunity against environmental conditions.
3. The temporary product evaluation will be conducted outdoors at a test facility on Alstom's campus in Grain Valley MO (<https://goo.gl/maps/eAeMFeYhqvt>). Two radar units will be mounted to a fixed pole at an approximate height of 10 feet above ground and pointed downwards to observe the distance estimated by the radar transceiver to background objects (eg rails, ties, ground, etc). These estimated distances will be observed to study the variation



over a time not to exceed 6 months with the purpose of studying the impacts of different environmental conditions (eg snow, rain, fog, temperature, etc) on the data. The goal is to understand the reliability of this technology to operate in an outdoor environment similar to that at a railroad crossing.

4. Operation of the experiment will occur no earlier than midnight January 8, 2018 and will end no later than midnight June 8, 2018.
5. The installation will be fixed to a ground mounted pole.
6. The experiment will be conducted on Alstom's campus in Grain Valley MO (<https://goo.gl/maps/eAeMFeYhqvt>). This facility is located in an isolated, rural area.
7. The devices (quantity 2) to be evaluated are Texas Instruments radar evaluation modules IWR1642BOOST (<http://www.ti.com/tool/IWR1642BOOST>). This device has been found to

comply with FCC Part 15 rules as indicated on page 19 of

<http://www.ti.com/lit/ug/swru521/swru521.pdf>

8. The frequency range of operation is 76-81GHz as indicated in Section 5.7 of the datasheet <http://www.ti.com/lit/ds/swrs212a/swrs212a.pdf>.
9. The transmitter output power is 12 dBm as indicated in Section 5.7 of the datasheet <http://www.ti.com/lit/ds/swrs212a/swrs212a.pdf> printed circuit board integrated antennas having a radiation pattern is shown in Figure 10 of <http://www.ti.com/lit/ug/swru521/swru521.pdf> and peak gain of 9 dBi.
10. Emission uses a binary phase modulation for MIMO radar as described in Section 6.3.1.2 in <http://www.ti.com/lit/ds/swrs212a/swrs212a.pdf> with a 4GHz bandwidth as mentioned on page 1 of the same document.
11. The radiating antenna will be mounted no higher than 10 feet from ground level on a fixed pole and will be angled downwards towards the ground to observe the estimated distance measured to the background reference objects.