Contribution ID: **5** Type: **not specified**

LBDS (20' + 10')

Wednesday, 24 November 2021 09:30 (30 minutes)

Modification of LBDS during LS2 aimed increasing of the beam dump system reliability in several ways: 1. upgrade of HV switch insulator design to reduce sparking probability; 2. increasing capacitance of energy storage capacitors resulting in reduced nominal voltages on generators and on magnets; 3. replacement of SEB sensitive HV semiconductor switches by less sensitive ones; 4. modification of the dilution kickers retriggering philosophy to reduce risk of critically low dilution kick due to anti-phase in case of erratic firing of one kicker. Post LS2 failure rate estimation at 7 TeV is now lower than pre LS2 one at 6.5 TeV. Upgraded LBDS system was tested up to 7.25 TeV in the tunnel for the whole system and up to 7.5 TeV in laboratory as a type test without any issues. Thanks to upgraded performance of the new triggering system of extraction generators and faster propagation speed in retriggering system, the delay of retrigger in case of asynchronous dump was reduced from original ~1.3 us down to less than 900 ns, thus resulting in lower risk of protection systems damage. We do not expect negative impact of eventual 1-year extension of Run 3 on LBDS reliability under nominal beam intensity conditions

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Session Classification: Session 2