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Remote qualification of HLS and WPS systems in the LHC tunnel

The position of the low beta quadrupoles of the LHC is monitored by Hydrostatic Levelling Systems (HLS) and Wire Positioning Systems (WPS). These magnets are located on each side of the four experimental areas, where the level of residual radiation will increase with the next steps of LHC operation. This will reduce the possibility of future access in these areas more and more. The regular validation of monitoring systems is very important to guarantee the sensor's fuunction and hence consistent data. Concerning the HLS system, the qualification is performed by varying the water level in the hydraulic network. The observed height difference on each of sensor along the network must be the same. Concerning the WPS system, the qualification is performed by displacing the wire on its both extremities. The difference between the readings of the sensors must be proportional to their longitudinal position. Two systems have been designed to perform such a remote qualification: a filling/purging system for the HLS system and a Wire Displacer System for the WPS. In this paper, the requirements and the solutions proposed are described, with the emphasis on the conceptual design and the results obtained.

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