

Machine Protection Availability and Performance 2010 – 2012

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Abstract

The performance and availability of the LHC Machine Protection System (MPS) has been studied for 2010 to 2012 operation.

The first part of this paper considers availability as the LHC MPS impact-on-physics, for each year of operation. The impact is quantified and influential sub-systems are outlined. Figures from the MPS are put in relation to other systems and events impacting on the physics program.

The second part considers observed MPS sub-system reliabilities using all fault information, not only that which impacts on physics. Key sub-systems of the MPS are outlined with their failure modes and rates contrasted. Remarks on MPS safety are inferred by considering MPS reliability, and the predicted ratio of safe to un-safe failures. The final section outlines predictions, conclusions, recommendations and suggestions for consideration during LS1.