

Additional MDSH functionality commissioning

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- New failure mode of the SPS discovered during design of new controls for new SBDS
- Basically a beam could be injected in the SPS even after the MKDs have been discharged
- Beam would circulate and even be accelerated without the possibility to dump it
- This can happen if MKDs fired in the about $70 \mu\text{s}$ that the MKP has between the prepulse and the start of the MKP pulse
- Thanks to the new injection interlock put in place in the SPS, we can exploit the MDSH to solve this issue
- The MDSH is asked to check for beam permit an additional time, that is 1 ms after injection
- In case of beam **NOT** permitted \rightarrow pulse the MDSH

Commissioning procedure followed



- Use a cycle with 2 injections
- Set early dump a few μs just before the second injection (1200 ms after the first one)
- Check that the MKP pulses (basically see that the second injection is OK)
- Evaluate the MDSH current - it should pulse after about 1200 ms after the first injection



Commissioning procedure followed



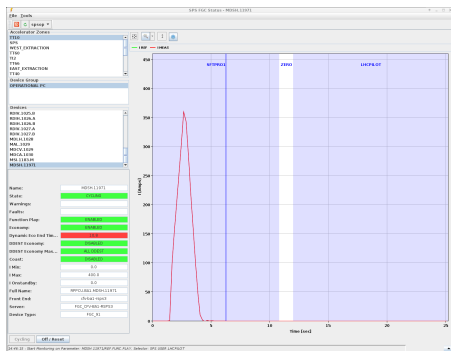
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- Successful test over the HW done to test the new functionality of the MDSH
- All the “ingredients” worked perfectly and we could prove that we have a solution to the recently discovered failure mode of the SBDS and injection
- Still need to test this with beam and assess where losses occurs and if this matches with simulations