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2P56 - MODERNIZATION OF THE MARX AND RIMFIRE TRIGGERING SYSTEMS FOR THE HERMES-III ACCELERATOR

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HERMES III is a 20-MeV linear induction accelerator that was constructed at Sandia National Laboratories in the late 1980's and continues operation to this day. The accelerator utilizes 10 Marx banks for its initial energy storage and pulse formation. These Marx banks discharge their energy into 20 intermediate storage capacitors which, in turn, feed 80 pulse forming lines that further condition the pulse. Transmission line feeds from the pulse forming lines then deliver the electrical energy to 20 induction cavities arrayed along the axis of the machine to build the final output pulse along a central magnetically insulated transmission line (MITL). There are two triggering systems within the accelerator that work together in this energy discharge process. One simultaneously triggers the initial energy discharge of energy from each of the 10 Marx banks; the other staggers the triggering of the Rimfire gas switches following each intermediate storage capacitor to synchronize the energy delivery to the downstream cavities with the pulse already propagating along the MITL from the upstream cavities. Until recently, these triggering systems were the original systems dating back to the initial commissioning of the accelerator, however both have now been replaced with new and more modernized systems. Design details for both triggering systems will be presented, along with an overview of some of the initial operational data from the HERMES III accelerator using these new triggering systems.

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