Justification of Risk for a Monitor Train Network.

- HEM-01 Passenger injury during evacuation following stopped train (not at a platform)

  Starting the fire alarm during an evacuation has a low risk of causing panic and an injury.

- HEM-03 Passenger struck while leaning out of train (train in running)

  Jamming doors open and spoofing a door closed message would lead to a train leaving the station with the doors open. However, the passenger would then have to lean out and be hit by something, so this is not a high risk.

- HEM-05 Train door closes on passenger

  Doors cannot be controlled on a monitor only network. Driver or guard will check doors before they are shut. Therefore, no risk.

- HEM-06 Passenger fall between train and platform

  We are assuming that falling between the train and platform happens due to an accidental slip, and that interfering with the doors or alarm systems will not make this significantly more likely. Hence no risk.

- HEM-07 Passenger fall from train in service onto track (no electric shock nor struck by train)

  A high risk comes from jamming the doors open and faking messages to the TMC to say the doors are shut. On a crowded train the risk of a fall could be high.

- HEM-08 Passenger fall from platform and struck by train

  Attacks on the train won't affect the risk of a fall from the platform.

- HEM-09 Passenger injury while boarding/alighting a train (platform side)

  There is a low risk that setting off the fire alarm could cause a crush and injury.

- HEM-10 Passenger struck by / contact with moving train on platform

  This would be caused by passengers being too close to the edge of the platform, not affected by train network attacks.

- HEM-11 Passenger struck/crushed by train while crossing the track at or near a station on a crossing

  Making the train go too fast might increase this risk, but the root cause would be the passenger on the tracks, hence the risk is low.

- HEM-12 MOP (trespasser) struck/crushed by train while on railway infrastructure at a station, HEM-14 Workforce (not infrastructure worker) struck/crushed by train

  These would seem to be caused by accidents, and would not significantly be affected by for instance network attacks. "not infrastructure worker" means not on the main line, which is addressed in a HEM-19.

- HEM-15 Workforce fall from moving train, HEM-16 Workforce injury while boarding/alighting train, HEM-17 Workforce struck while leaning out of train (train in running)

  As the passenger equivalent risks attacks above, with a lower risk because workforce are less likely to be crowded against the doors.

- HEM-19 Workforce struck/crushed by train in motion

  This risk comes from workers on the line. All trains must pass them at a slow speed. Faking a MA or speed could lead to a train passing line works at full speed, which would be a major risk.

- HEM-20 Workforce struck by flying object thrown up by passing train (includes objects thrown up by OTM movements outside a possession), HEM-21 Workforce fall between stationary train and platform

  Not related to network attacks.

- HEM-22 Workforce fall out of train onto track at a station (no electric shock nor struck by train), HEM-23 Train door closes on workforce

  As the passenger-equivalent risks attacks above.

- HEM-25 MOP (trespasser) struck/crushed by train while on railway infrastructure not at a station

  The risk would be due to the trespasser on the line.

- HEM-27 MOP (non-trespasser) pedestrian or cyclist struck/crushed by train on level crossing or footpath crossing

  Low risk due to making the train go through a crossing too fast.

- HEM-30 MOP (trespasser) fall while on train exterior, HEM-31 Suicide (or attempted suicide) involving rolling stock in motion, HEM-32 MOP (non-trespasser) outside railway infrastructure struck by object from operations on railway infrastructure

  Not related to network attacks.

- HEM-38 Passenger injury due to sudden train movement, HEM-39 Workforce injury due to sudden train movement

  Faking a speed more than 15% above the maximum allowed speed will lead to an emergency stop. Faking signals from the Vigilance unit would have the same affect. An emergency stop on a high-speed train, at full speed could cause injury.

- HEM-40 MOP (non-trespasser) struck by / contact with moving train due to being too close to platform edge, HEM-41 MOP (non-trespasser) fall between stationary train and platform, HEM-42 Passenger struck by flying object thrown up by passing train while at a station, HEM-43 Train door closes on MOP (non-trespasser), HEM-44 MOP (trespasser) jump from train in service

  No risk, following the reasoning for equivalent Passenger/workforce risks above.

- HEM-45 MOP (non-trespasser) movement-related injury on YD&S site, HEM-46 MOP (trespasser) injured by/on moving train on YD&S site

  YD&S is the yard, depot or siding. The drive will be driving slowly, by eye, faking the speed displayed on the TMC is unlikely to have an effect.

- HEM-48 Workforce injury on trains in running

  A catch all, which is the max of possible workforce injuries above.

- HEM-49 MOP (non-trespasser) fall from platform and struck by train

  As HEM-08

- HEM-50 Witnessing a traumatic event (movement)

  A max of all high risk that may lead to injury.

The Hazardous Events Non-movement risks are not related to trains or movement, therefore attacks on a train network will not affect these.