Functional Block Requirements

F000 Internal states of subsystems shall be externally available.

F001 Supervisory Station
F001.00 Receive any error or failure alarms from robot
F001.01 Send work tasks (keep track or clock and time)
F001.02 Receive robot location
F001.03 Interact with wired communication
F001.04 Request and receive management data
F001.05 Keep track of completed tasks
F001.06 Controls the start and stop time of a shift
F001.07 User I/O

F002 Wired Communication
F002.00 Communication from supervisory to each zone
F002.01 Communication from zone to zone
F002.02 Each node needs to be specially addressed
F002.03 Able to communicate and bridge with wireless (Tx, Rx)

F003 Wireless Communication
F003.00 Allow Tx, Rx between ceiling nodes to robots
F003.01 Able to communicate and bridge with wired
F003.02 Each node and robot needs to be specifically addressable
F003.03 Branch data with central control on each robot
F003.04 For robot to robot communication, the steps for communication need to be as follows: robot – ceiling – robot
F003.05 Make location available to navigation

F004 Navigation
F004.00 Accepts destination commands
F004.01 Get position from wireless
F004.02 Decide how to get to final location from current location
F004.03 Give motor control requests for movement
F004.04 Know map of mine

F005 Motor Control
F005.00 Follow tape and steer accordingly
F005.01 Take requests from navigation for major movements
F005.02 Issue control movements specific to each motor
F005.03 Panic Shutoff
F005.04 Bump Sensor
F005.05 Inform navigation of intersections, destination and completion of assigned tasks
F005.06 Determines speed of motors
F005.07 Respond if robot goes off tape
Functional Block Requirements

F006  Power Monitoring/Distribution
      F006.00  Passively distributes power to all functional blocks on the robot
      F006.01  Informs central control of low battery life
      F006.02  Current overdraw

F007  Sanity
      F007.00  Sanity System – resets central control

F008  Central Control
      F008.00  Transmit and receive with communication network
      F008.01  Issues destination commands to navigation
      F008.02  Control system restart
      F008.03  Receive faults from robot systems
      F008.04  Communicate with all robot subsystems
      F008.05  Communicate with sanity
      F008.06  Manages high-level operation decisions