

Process Step	Potential Failure Mode	Potential Failure Effect	SEV
What is the step?	In what ways can the step go wrong?	What is the impact on the customer if the failure mode is not prevented or corrected?	How severe is the effect on the customer?
Users should be able to utilize the sensor to collect and upload readings of hazardous particulates (Hazards: H1U-H3U)	1. Sensors do not read ANY particulate counts 2. Sensors report inaccurate particulate counts 3. Database is down, data can't be pushed from the sensors to the database	1./2. A user may unknowingly enter an unsafe area and become exposed to harmful material, negatively affecting his/her health 3. Annoyed researcher can't access the desired database	SEV of 10 for all failure modes
Consumers should be able to receive data and warnings from the collected readings (Hazards: H1C, H2C)	1. Device fails to send warning signal for hazardous conditions 2. App receives an incorrect warning	1. A user may enter an unsafe area and become exposed to harmful material, negatively affecting his/her health 2. Annoyed user	1. has SEV of 10 2. has SEV of 4
User focused			
Consumer focused			

Potential Causes	OCC	Current Process Controls	DET
What causes the step to go wrong (i.e. how could the failure mode occur?)	How frequently is the cause likely to occur?	What are the existing controls that either prevent the failure mode from occurring or detect should it occur?	How Probable is detection of the failure mode or its cause?
1. Sensor hardware failure 2. Inherent inaccuracy of sensors' measurement sensitivity 3. Network connection to database is down, database itself is down	1. has OCC of 3 2. has OCC of 7 3. has OCC of 5	1. Manufacturer's guarantee on fidelity of sensor hardware (mean time to fault for sensors) 2. Proper testing and validation of sensor software and sensor measurement capabilities 3. Regular Database maintenance	1. has DET of 7 2. has DET of 10 3. has DET of 1
1. Limited or no network connection in the area, warning is not able to reach the user's mobile device 2. Sensors record	1. has OCC of 4 2. has OCC of 3	1. Verify ability of app to connect to a network and receive signals before entering hazardous area 2. Verify the integrity of the sensors by	DET of 1 for all failure modes

RPN	Action Recommended
Risk Priority number calculated as SEV x OCC x DET	What are the actions for reducing the occurrence of the cause or for improving its detection? Provide actions on all high RPNs and on severity ratings of 9 or 10
1. has RPN of 210 2. has RPN of 700 3. has RPN of 50	1. regular preventive maintenance on sensor hardware, swapping of potentially faulty sensors 2. Regular validations performed on the accuracy of sensor measurements using a measurement of
1. has RPN of 40 2. has RPN of 12	1. Ensure that app is able to properly connect to network and sensors before a hazardous area is entered. Warn user if the app's