**FUNCTIONAL REQUIREMENT SPECIFICATION:**

**Use Case Description:**

**Overflow detection:**

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| Use Case Name | Overflow detection |
| Trigger | When the flow of water increases then nearest corporate office will be notified. |
| Precondition | Given threshold value for overflow sensor. |
| Basic Path | 1. The sensor should place in such a way that water should flow through it.  2. The rotor in the flow sensor rotates with a high speed whenever there is an overflow.  3. If the value exceeds the threshold then device will send the message to the nearest corporate office. |
| PostCondition | Overflow of the water is detected. |
| Exception path | None |

**Gas detection:**

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| Use Case Name | Gas detection |
| Trigger | When there are gases detected in the air then nearest corporate office will be notified. |
| Precondition | Gas sensor should be maintained in stable temperature. |
| Basic Path | 1. The sensor should be placed on the roof of the drainage system.  2. When the gas is detected, the sensing material changes the resistence.  3. If the digital output is 0 then the gas is detected and will sends a message to nearby corporate office. |
| PostCondition | Gas is detected. |
| Exception path | None |

**Sewage level / Water level detection:**

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| --- | --- |
| Use Case Name | Water level detection |
| Trigger | When the water level increases then nearest corporate office will be notified. |
| Precondition | Given threshold value for ultrasonic sensor. |
| Basic Path | 1. The ultrasonic sensor should be placed on the roof of the drainage system.  2. Distance is calculated based on the time taken to receive the ultrasonic wave back.  3. If the distance calculated is less than the threshold value then a message will be sent to the nearest corporate office. |
| PostCondition | Sewage / water level is detected. |
| Exception path | None |

**Manhole opening detection:**

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| --- | --- |
| Use Case Name | Manhole opening |
| Trigger | When the manhole is opened then nearest corporate office will be notified. |
| Precondition | Tilt sensor should be place hanged to the manhole plate. |
| Basic Path | 1. Tilt sensor should be placed hanged to the manhole plate.  2. The balls inside the sensor moves according to the position of the sensor and measure the tilt in multiple axes of a reference plane.  3. If the slope measured is more then it sends a message to the nearest corporate office. |
| PostCondition | Manhole opening is detected. |
| Exception path | None |

**Location Identification:**

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| --- | --- |
| Use Case Name | Location identification |
| Trigger | When any of the above cases occur then nearest corporate office will be notified.. |
| Precondition | Setting up of GPS module. |
| Basic Path | 1. Setting up of GPS module  2. The receiver in the GPS module calculates the distance from GPS satellites.  3. Based on the distance calculated location is identified. |
| PostCondition | If any of the above cases occur then a message will be sent along with this location. |
| Exception path | None |

**LCD Instructors:**

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| --- | --- |
| Use Case Name | LCD instructor |
| Trigger | If any of the above cases occur, to alert nearby people. |
| Precondition | Hang LCD module to the nearby polls. |
| Basic Path | 1. Place LCD module.  2. If any of the above cases occur then a message will be displayed. |
| PostCondition | If any of the above cases are met then the nearby corporate office will be notified. |
| Exception path | The user can view the display or can ignore. |

**Sending message:**

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| --- | --- |
| Use Case Name | Sending message |
| Trigger | When any of the sensor exceeds the threshold value then nearest corporate office will be notified.. |
| Precondition | Activating the GSM module by inserting the sim card. |
| Basic Path | 1. GSM module is installed.  2. If any of the sensor exceeds the threshold value then a message will be sent to the nearest corporate office. |
| PostCondition | Nearest corporate office will be notified when any of the above conditions met. |
| Exception path | None |

**Developer:**

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| --- | --- |
| Function Description | Developer assembles all the sensors and places them in the correct place. The maintenance of the sensors will be handled by the developer. If any sensor fails to work, developer replaces them. |
| Function Input | Developer gathers all the necessary sensors and places them in the correct place. |
| Function Output | Analyses the data collected from the various sensors and notifies it to the nearest corporate office. |
| PreCondition | Knowledge of how sensor works. |
| Process | Properly places all the sensors and interpret the data given by the sensors and notifies it to the nearest corporate office. |

**Corporate office:**

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| --- | --- |
| Function Description | They takes the information from the SMS and accordingly sends the workers to take necessary action. |
| Function Input | SMS coming through the GSM module. |
| Function Output | Proper maintenance of the drainage system. |
| PreCondition | Having proper infrastructure to receive messages. |
| Process | Viewing the messages and analysing what appropriate action to be taken for maintaining the drainage system properly. |

**User:**

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| --- | --- |
| Function Description | Views the message on the LCD display and takes another way. |
| Function Input | Message displayed on the LCD display. |
| Function Output | If the drainage is not properly maintained then he/she thinks of the best way to reach destination. |
| PreCondition | He/she needs to view the LCD display. |
| Process | While passing user needs to check the LCD display to know whether drainage is overflowed or not. If drainage is not properly maintained then he/she thinks of the best way to reach destination. |