# Assignment #3 – Template

Software Requirements Specification

Revision History

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| **Date** | **Revision** | **Description** | **Author** |
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# Purpose

This document outlines the requirements for the Mine Pump Control System (MPC).

## Scope

This document will catalog the user, system, and hardware requirements for the MPC system. It will not, however, document how these requirements will be implemented.

## Definitions, Acronyms, Abbreviations

Water sensor – detects the level of water within the mine

Methane sensor – detects the level of methane (measured in N parts per million)

Operator – Person who uses the system to start and stop water pump

Supervisor – Person who uses the system to reset and override water pump behavior

Log – Collection of sensor data that is deleted every 30 days

## References

Use Case Specification Document – Step 2 in assignment description

UML Use Case Diagrams Document – Step 3 in assignment description

Class Diagrams – Step 5 in assignment description

Sequence Diagrams – Step 6 in assignment description

## Overview

The Mine Pump Control System (MPC), is designed to monitor and pump flood water out of mine shafts. As underground mining operations take place far below the water table, flooding into mine galleries and shafts is an ever-present danger.

# Overall Description

## Product Perspective

## Product Architecture

The system will be organized into the Flood Regulation module, the Methane Alarm module, and the Records module.

## Product Functionality/Features

The high-level features of the system are as follows (see section 3 of this document for more detailed requirements that address these features):

## Constraints

Since users must log in to use the system, Operators and Supervisors must have a login already.

## Assumptions and Dependencies

It is assumed that the program and interface will be implemented at a later date.

# Specific Requirements

## Functional Requirements

### Common Requirements:

Users should be able to input a username and password to validate identity.

### Flood Regulation Module Requirements:

Operators should be able to start and stop the water pump if water is between the max and minimum levels.

Supervisors should be able to start and stop the pump regardless of water level.

Supervisors should be able to reset the pump system to resume automatic behavior.

### Methane Alarm Module Requirements:

The sensor data should be evaluated if dangerous levels of methane are present.

The module must be able to trigger an evacuation alarm when dangerous levels of methane are present.

The module must be able to turn off the flood regulation system when dangerous levels of methane are present

### Records Module Requirements:

The module should keep pump activity information for a maximum of 30 days from date of occurrence.

The module should keep methane triggered sensor activity for a maximum of 30 days from date of occurrence.

The module should keep methane readings that occur every 30 minutes for a maximum of 30 days from date of occurrence.

## External Interface Requirements

The system must provide an interface to the Operators and Supervisors of the mine so that they can log in and manage the water pump and view appropriate record history dependent on their role.

## Internal Interface Requirements

The system must process data from sensors and pumps and log that data using the Records module. The fields included are name, water level, employee id, note, and time of activity.

# Non-Functional Requirements

## Security and Privacy Requirements

The system must validate a person’s identity prior to giving access to any controls.

System must encrypt record information and only allow access to certain files dependent on role of person.

## Environmental Requirements

System must be deployed with a set of sensors to maintain reliability and consistency against product/system malfunctions.

System must not be compatible with third party pumps or sensors to maintain reliability and consistency against product/system malfunctions.

## Performance Requirements

System must be able to perform 24/7, without the need to restart or reboot.