**Use Case Specification –System Login**

Use Case ID: *0-0*Use Case Name: *System Login*

Relevant Requirements: *Requirements Specification Document.docx*

Primary Actor: *Any user*

Pre-conditions:  *User wishes to access the system.*

Post-conditions: *User has been granted appropriate permissions within the system.*

Basic Flow or Main Scenario:

User with valid credentials, no permissions granted:

1. *User provides valid credentials but account has no permissions granted.*
2. *System responds by allowing login but denying access Pump Control or System Logs.*

User with Operator account credentials:

1. *User tries to log in to Operator account*
2. *System responds by granting Operator-level permissions to the user.*

User with Supervisor account credentials:

1. *User tries to log in without any permissions granted*
2. *System responds by denying the login.*

Extensions or Alternate Flows: None.

Exceptions:

User with invalid credentials:

1. *User tries to log in with incorrect credentials.*
2. *System rejects the login.*

Related Use Cases: 1-0, 1-1, 1-2, 2-0, 2-1, 2-2

**Use Case Specification - Pump Control by Sensors**

Use Case ID: *1-0*Use Case Name: *Pump Control by Sensors*

Relevant Requirements: *Requirements Specification Document.docx*

Primary Actor: *Automatic*

Pre-conditions:  *Pump control has not been overridden by an Operator or Supervisor*

Post-conditions: *Pump is under automatic control based off sensor data.*

Basic Flow or Main Scenario:

Water Level Sensors:

1. *High water sensor reports flooding risk (maximum acceptable water level reached).*
2. *System responds by turning the pump on until the low water sensor reports the lowest acceptable level of water.*
3. *Log Entry created (pump startup/shutoff by high/low sensor)*

Methane Level Sensors:

1. *System retrieves methane level from sensor every 30 minutes.*
2. *Sensor reports unacceptable level of methane.*
3. *System responds by switching off the pump regardless of current water level.*
4. *Evacuation Alarm is triggered.*
5. *Log Entry created (evacuation alarm triggered by methane sensor)*

Extensions or Alternate Flows: None.

Exceptions:

Water Level Sensors:

1. *High water sensor reports flooding risk (maximum acceptable water level reached)*
2. *System unable to respond due to Supervisor override, system waiting to be reset.*

Related Use Cases: 0-0

**Use Case Specification - Pump Control by Supervisor**

Use Case ID: *1-1*Use Case Name: *Pump Control by Supervisor*

Relevant Requirements: *Requirements Specification Document.docx*

Primary Actor: *Supervisor*

Pre-conditions: *User has Supervisor-level permissions.*

Post-conditions: *Full control of pump system is granted regardless of sensor data or automatic behavior.*

Basic Flow or Main Scenario:

1. *User initiates a manual pump startup or shutoff.*
2. *System responds by turning the pump on or off.*

Extensions or Alternate Flows:

1. *User initiates a pump reset.*
2. *System responds by resetting the state of the pump to automatic behavior.*

Exceptions: *None.*

Related Use Cases: 0-0

**Use Case Specification - Pump Control by Operator**

Use Case ID: *1-2*Use Case Name: *Pump Control by Operator*

Relevant Requirements: *Requirements Specification Document.docx*

Primary Actor: *Operator*

Pre-conditions: *User has Operator-level permissions.*

Post-conditions: *Limited control of pump system is granted under valid system-level interpretation of sensor data.*

Basic Flow or Main Scenario:

1. *User initiates a manual pump startup or shutoff while water level is between minimum and maximum sensor limits.*
2. *System responds by checking the current water level. If water level is between minimum and maximum sensor limits, the command is accepted.*
3. *Log Entry created (pump switched on/off by Operator)*

Extensions or Alternate Flows: *None.*

Exceptions:

Pump Reset:

1. *User initiates a pump reset.*
2. *System denies the reset commend (requires supervisor permissions)*

Manual Pump Startup or Shutoff:

1. *User initiates a manual startup or shutdown command while water level is not between minimum and maximum sensor limits. The command is denied (requires Supervisor permissions).*

Related Use Cases: 0-0

**Use Case Specification Log Access**

Use Case ID: *2-0*Use Case Name: *Log Access*

Relevant Requirements: *Requirements Specification Document.docx*

Primary Actor:

Pre-conditions: *User does not have login permissions.*

Post-conditions: *No access to system logs.*

Basic Flow or Main Scenario:

1. *User queries the system log*
2. *System responds by asking for valid permission.*
3. *If no permission is provided, the query is denied.*

Extensions or Alternate Flows: None.

Exceptions: *None.*

Related Use Cases: 0-0

**Use Case Specification Log Access by Supervisor**

Use Case ID: *2-1*Use Case Name: *Log Access by Supervisor*

Relevant Requirements: *Requirements Specification Document.docx*

Primary Actor: *Supervisor*

Pre-conditions: *User has Supervisor-level permissions.*

Post-conditions: *Full access to system logs.*

Basic Flow or Main Scenario:

1. *User queries the system log*
2. *System responds by providing unrestricted access to log data.*

Extensions or Alternate Flows: None.

Exceptions: *None.*

Related Use Cases: 0-0

**Use Case Specification Log Access by Operator**

Use Case ID: *2-2*Use Case Name: *Log Access by Operator*

Relevant Requirements: *Requirements Specification Document.docx*

Primary Actor: Operator

Pre-conditions: *User has Operator-level permissions.*

Post-conditions: *User has limited access (last 24 hours) of system logs.*

Basic Flow or Main Scenario:

1. *User queries the system log*
2. *System responds with limited access (last 24 hours) of system logs.*

Extensions or Alternate Flows: None.

Exceptions:

1. *User queries system log for entries older an 24 hours.*
2. *System requires Supervisor-level permission before query is accepted.*

Related Use Cases: 2-0, 0-0