2. Vision Statement

The newly developed New South Wales (NSW) Metro Slip Hazard System (MSHS) aims to implement new software in order to provide a safe mode of transport to those who board the NSW metro. The current Macquarie metro is autonomous train in which aims to provide shorter travel time and has unattended staff. Within 1 year, the system will be placed in production to ensure the health and safety of our passengers. This system will also be readily available to integrate with the extended metro stations that are intended to be complete in 2025. The NSW MSHS aims to provide shorter travel time and assuring the comfort of our patrons.

3. Short Software Requirements Specification (SRS)

I. Revision History

Table 1. Revision History

Revision History	Author	Who Agreed to Change	Comment
1.0	Vivian Wu	Vivian Wu	Made a draft for SRS. Added relevant sections.
2.0	Vivian Wu	Vivian Wu and Noah Kwon	Made changes to requirements after discussion with the client.
3.0	Vivian Wu	Vivian Wu and Noah Kwon	Added new requirements.

1. Introduction

This section briefly describes the purpose of this record and the scope of the project.

1.2. Purpose (of the software/system)

This document is purposed to all the relevant stakeholders, and delineates the specifications of the NSW Metro Slip Hazard System (MSHS).

1.3. Scope

The NSW Metro Slip Hazard System shall be integrated with the current metro surveillance system to detect possible spill hazards on metro trains and platforms. The purpose of the development of this system is to ensure the health and safety of their employees and passengers. The surveillance cameras should detect spills and relevant metro staff should be notified of the spill. The metro doors near the spills should be disabled until the spill is taken care of by a Station Staff. The status of the metro doors should also be displayed or disclosed to passengers in some form of communication.

1.4. Definitions, acronyms and abbreviations

Table 2. Terms and Definitions

Terms and Abbreviations	Definition
NSW	New South Wales
NSW MSHS	NSW Metro Slip Hazard System
CONXXX	Constraints XXX (where X are numbers)
LCD	Liquid Crystal Display
ASSXXX	Assumptions XXX (where X are numbers)
CPR	Cardiopulmonary Resuscitation
FRQXXX	Functional Requirements XXX (where X are numbers)
QRQXXX	Quality Requirements XXX (where X are numbers)

2. Overview

2.1. User characteristics

The characteristics of the users may influence their ability to use and interact with the MSHS. The level of education and expertise of the metro users will not affect their ability to understand spill hazard notices. Metro Staff, including Mobile Staff, Central Command Staff and Main Office Staff, should be trained to use the system.

3. Constraints

CON101 - Time Constraint

The client has requested for the project to be completed within the given time frame.

CON102 - Interface Constraint

The new system needs to be integrated with the existing metro system. There will also be changes to the data currently displayed on the metro platform and train screens. The platform screens should display additional data, the status of the doors, at the bottom. The metro train ceiling Liquid Crystal Displays (LCDs) shall also display new messages such as a wet weather reminder and doors that are temporarily disabled.

4. Assumptions

ASS101 - Trained Staff

Station Staff should all be trained in First Aid and/or Cardiopulmonary Resuscitation (CPR) in case of any misfortunes or incidents, which may occur due to a slip hazard.

ASS102 - The platform safety doors that correspond to the metro train doors will be disabled.

5. Functional Requirements

FRQ101. The system shall detect any spills on the metro or on the metro platform.

FRQ102. The System shall notify all Station Staff of a spill that has occurred at a station platform (when it is the next station) or on the metro.

Fit Criteria: All staff should receive the same location spill. A single spill should only be in one location.

FRQ103. The System shall have a hazard level associated with each notification.

Fit Criteria: A numerical value will be assigned to each hazard level.

FRQ104. The System shall broadcast friendly reminders to passengers that the platform is wet from the rain, but affected doors will not be disabled.

Fit Criteria: There should be a broadcast or notification displayed on the platform and inside the train displays.

FRQ105. The System shall notify all passengers (inside the metro and on the platform) of spill hazards via the screens inside the metro and ceiling screens.

Fit Criteria: The content of the notification should be consistent on all screens.

FRQ106. The System shall disable any doors and their corresponding platform safety doors with slip hazards near them, until the issue has been resolved.

Fit Criteria: The disabled train and platform doors should both be the same number.

FRQ107. The current platform screens on the station shall notify and display which doors are unavailable and/or disabled.

Fit Criteria: The disabled door number on the platform screens shall be identical to the door number that was requested to be disabled.

FRQ108. The System shall allow the Central Command Staff to classify the hazard category.

Fit Criteria: 1 – Insignificant
2 – Minor
3 – Moderate

4 – Major
5 – Catastrophic (Something like that)

6. Quality Requirements

QRQ101. When a spill is detected, Staff should be notified of the spill within 100 ms.

QRQ102. Performance: The system shall allow up to 100 users to view a notification at the same time.

QRQ103. Reliability: The system shall be available 95% of the time.

4. Use Case Diagram for NSW MSHS

Figure 1. Use Case Diagram

5. A Use Case Description for the Three Most Important Use Cases (three pages)

<table>
<tr><td>Use Case</td><td colspan="2">Detect Spill</td></tr>
<tr><td>Goal
<a longer statement of the goal in context if needed></td><td colspan="2">To detect a spill that has occurred on a metro train or metro platform</td></tr>
<tr><td>Preconditions
<what we expect is already the state of the world></td><td colspan="2">A Passenger has spilled their drink.
There has been some (heavy) rainfall.</td></tr>
<tr><td>Success End Condition
<the state of the world upon successful completion></td><td colspan="2">A spill is detected.</td></tr>
<tr><td>Failed End Condition
<the state of the world if goal abandoned></td><td colspan="2">The spill has not been detected.</td></tr>
<tr><td>Primary Actors;

Secondary Actors</td><td colspan="2">Surveillance Camera System

Main Office Staff
Central Command Staff</td></tr>
<tr><td>Trigger
<the action upon the system that starts use case></td><td colspan="2">There is an abnormality detected on a surface on the metro or platform.</td></tr>
<tr><td rowspan="6">Description / Main Success Scenario
<the steps of the scenario from trigger to goal delivery and any clean up after. Indicate substeps using numbering></td><td>Step</td><td>Action</td></tr>
<tr><td>1.</td><td>The Surveillance Camera System detects an abnormality on a surface.</td></tr>
<tr><td>2.</td><td>The Surveillance Camera System notifies the Central Command Staff of the location of the spill.</td></tr>
<tr><td>3.</td><td>The Central Command Staff decides the level of seriousness of the spill hazard.</td></tr>
<tr><td>4.</td><td>The Central Command Staff sends the spill location and the hazard category to the Main Office Staff.</td></tr>
<tr><td>5.</td><td>The Main Office sends a “Received” message back to the Central Command Staff to let them know that the data has been received.</td></tr>
</table>

	6.	The Central Command Staff then sends a “Received” message to the Surveillance Camera System to let them know that the message has been received.
Alternative Flows <a: condition causing branching> <a1: action or name of sub use case>	**Step**	**Branching Action**
	2.a	The Surveillance Camera System fails to establish a connection with the Central Command Staff and no message is sent.
	2.b	The Surveillance Camera System attempts to send data again.

Use Case	Disable / Enable Platform Safety Door	
Goal <a longer statement of the goal in context if needed>	To disable a door	
Preconditions <what we expect is already the state of the world>	There is a spill near a platform door or train door, and detected the spill. Central Command Staff has been notified of the spill.	
Success End Condition <the state of the world upon successful completion>	The requested platform safety door and its corresponding metro train door are both disabled /enabled until further notice from the Station Staff.	
Failed End Condition <the state of the world if goal abandoned>	The requested platform safety door and train door are not disabled / enabled, and the request goes to a pending state.	
Primary Actors; **Secondary Actors**	Central Command Staff	
Trigger <the action upon the system that starts use case>	Central Command Staff receives a notification of the spill from the Surveillance Camera System.	
Description / Main Success Scenario <the steps of the scenario from trigger to goal delivery and any clean up after. Indicate substeps using numbering>	**Step**	**Action**
	1.	The Central Command Staff selects the “Disable Door” function.
	2.	The System displays the list of door numbers.
	3.	The Central Command Staff selects a door number to disable.
	4.	The System displays a confirmation prompt.
	5.	The Central Command Staff selects “Yes”.
	6.	The System disables the door, and prompts that the command was successfully carried out.
Alternative Flows <a: condition causing branching> <a1: action or name of sub use case>	**Step**	**Branching Action**
	1.a.	The System fails to establish a stable connection, and does not receive the command.
	1.b.	Go to step 1 again.
	2.a.	The System fails to display the list of doors.
	2.b.	The System attempts to retrieve and display the list.

Use Case	Resolve Notification	
Goal <a longer statement of the goal in context if needed>	To resolve the notification.	
Preconditions <what we expect is already the state of the world>	The spill has been taken care of.	
Success End Condition <the state of the world upon successful completion>	The hazard has been taken care of, and Mobile Staff will return to their other responsibilities.	
Failed End Condition <the state of the world if goal abandoned>	The notification still exists and is pending to be completed.	
Primary Actors; **Secondary Actors**	Central Command Staff Mobile Staff	
Trigger <the action upon the system that starts use case>	Mobile Staff removes spill hazard.	
Description / Main Success Scenario <the steps of the scenario from trigger to goal delivery and any clean up after. Indicate substeps using numbering>	**Step**	**Action**
	1.	The Mobile Staff resolves the notification for the particular spill.
	2.	The System marks the notification as resolved, and stores it under the resolved list.
	3.	The System sends a notification to the Central Command Staff to oversee the issue.
Alternative Flows <a: condition causing branching> <a1: action or name of sub use case>	**Step**	**Branching Action**
	1.a.	The System does not receive the resolution request.
	1.b.	Return to Step 1.

6. A Sequence Diagram for the most important use case

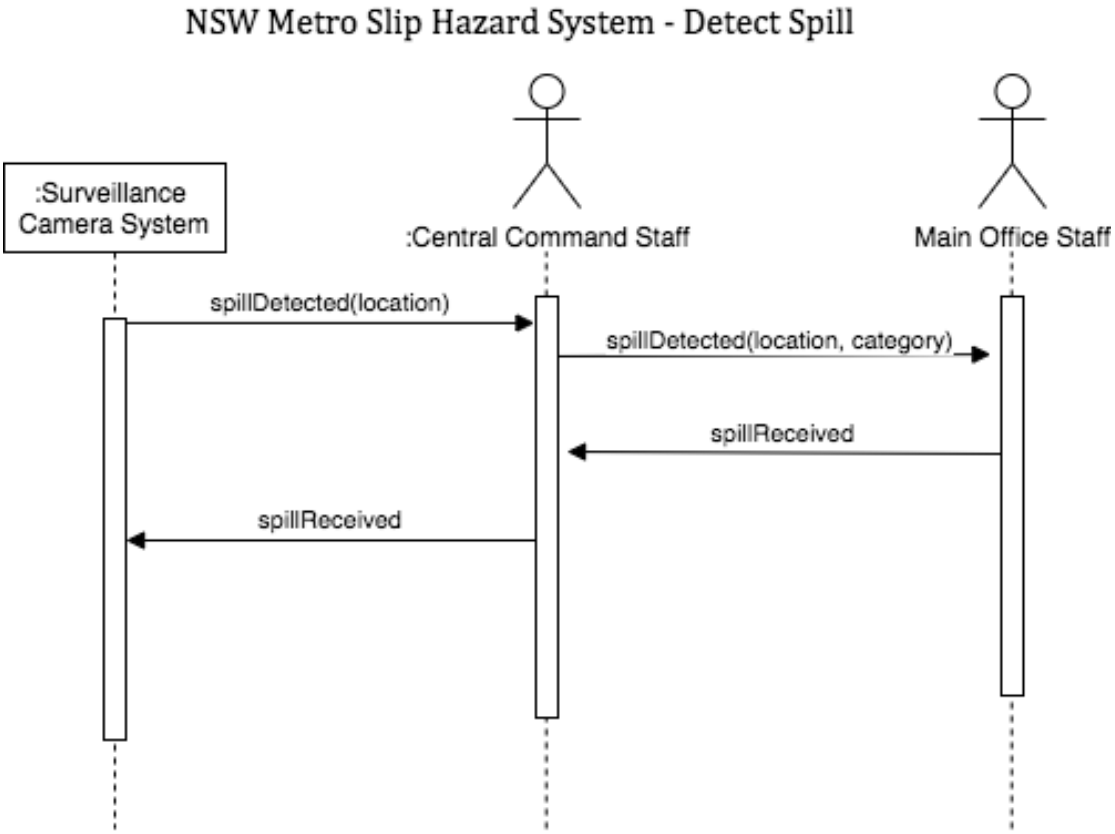

Figure 2. Sequence Diagram for Detect Spill

Assumptions: The Surveillance Camera System can only detect whether there is a spill or not, and is unable to determine the hazard category of the spill.