UNIVERSITY of TASMANIA

Assignment 3 Agile Cycle 2 Report
Fast Rescue Boat (FRB) Partial Mission Simulator

KIT302 ICT Project A

FAST RESCUE BOAT (FRB) OPERATOR'S COURSE (AMCS, 2024)

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Table of Contents

Introduction

Project Background

The Fast Rescue Boat (FRB) Partial Mission Simulator is a project initiated by the Australian Maritime College (AMC) to improve the training of FRB operators. It is designed to provide a realistic simulation of different weather and water conditions, addressing the limitations of current AMC Beauty Point campus training methods. The project aims to enhance skill retention and preparedness, serving diverse users, including trainees, certified operators, AMC staff, and technical support personnel.

Purpose of the Report

This report details the activities and achievements of Agile Cycle 2, providing insights into the design and development process. It evaluates the project's progress, documents client feedback, and outlines necessary changes for future development cycles. The primary purpose of this report is to provide a comprehensive overview of the project's status, including its successes and challenges, and to guide future development cycles based on the lessons learned.

Structure of the Report

The report is structured as follows:

- **User Mapping:** Re-evaluation of clients needs to be reflected by alterations to the RTM and project schedule

- **System Interfaces:** Analysis of design decisions and progress in interface development.
- **Functionality:** Discussion of architectural decisions and technical development progress.
- **User Testing:** Outline the methodology and outcomes from tests of the simulator's perceived usefulness and usability.
- **Technical Testing:** Outline of the methods and outcomes from tests for the simulator's functionality.
- **Quality and compliance:** The design decisions and technical prototype outcomes and how they reflect the Quality and Compliance requirements described in the planning report.
- **Review of Progress and Required Changes:** This evaluation evaluates alignment with the project schedule, requirements changes, and project plan updates.
- **Conclusions:** Recap of critical findings and future directions.

User Mapping

Understanding User Needs

The Fast Rescue Boat (FRB) Partial Mission Simulator is meticulously designed to meet the specific needs of the Australian Maritime College (AMC). It is intended to provide flexible and realistic training experiences, regardless of weather conditions, for AMC instructors and trainees.

User-Centred Design Principles

To ensure the simulator meets the needs of these diverse users, we applied fundamental user-centred design principles. The design allows instructors to simulate weather and wave conditions that might not be present on a given training day, such as calm waters when the weather is rough or vice versa. In response to client feedback during our last client meeting, we adopted the time of day control to remain fixed at midday, prioritising more granular control over wind conditions and directions, better reflecting real-world training needs.

User Personas and Journey Maps

While specific user personas were not developed, we mapped the typical journey of the instructor and trainee through the simulator. For instructors, the journey involves setting up the simulation with the desired environmental conditions, using a streamlined interface to control wind, waves, and weather. For trainees, the focus is on completing missions like pacing and man overboard under these preset conditions in a third-person perspective, ensuring that the simulation challenges them appropriately.

Feedback from Agile Cycle 1

Client feedback from Agile Cycle 1 highlighted the need for more detailed control over environmental variables, leading us to modify the Requirements Traceability Matrix (RTM) and project schedule. The feedback also informed changes in the interface design, such as separating the mission objectives and condition selection into distinct menus for ease of use. The RTM was updated to reflect these new requirements, and the project schedule was adjusted to prioritise developing these features early in Agile Cycle 2.

Updates to the RTM and Project Schedule

Based on the client's requirements, the RTM was augmented to include new entries for wind control and refined wave conditions. The project schedule was adjusted to accommodate these changes, ensuring sufficient time was allocated for testing and integration without compromising the delivery timeline. This careful planning allowed the team to incorporate new features like detailed mother ship and environmental interactions while maintaining a steady project pace.

Challenges and Solutions

One of the significant challenges encountered was integrating weather, waves, and wind systems to create a cohesive simulation environment. Ensuring the boat's movements realistically responded to wave conditions required extensive testing and fine-tuning. This challenge was addressed by isolating these elements in a test scene before fully integrating them into the primary simulator environment, allowing for precise adjustments without disrupting ongoing mission development.

Application of Previous Knowledge

In their third year, all team members leveraged their cumulative knowledge from previous ICT and Project Management units to address these challenges. Their experience with Unity was precious in developing the complex environmental simulations required for the project. This prior learning application ensured the simulator met the client's current needs. It allowed for future enhancements, such as the potential integration of multi-monitor setups or VR, as indicated by the client.

System interfaces

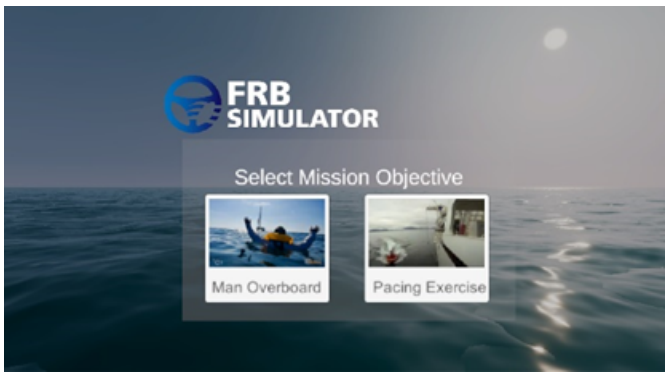
Updates from the first Agile cycle

Our system interfaces evolved after receiving client feedback from our first agile cycle prototype. During the Agile 1 phase, we developed a single selector menu composed of toggles to select the “Mission Objective” and “Ocean Condition.” We received feedback that they would like it more if the menus were broken up into a “Mission Objective” menu and a “Conditions” menu.

Title Screen Menu

This menu page consists of 3 interactable parts:
The start button loads the Objective Select menu.
The settings button loads a setting menu.
The Exit button (found in the top right) exits the simulator.

We kept the main aspects of the previous title iteration from Agile Cycle 1, such as the view being lined up with the horizon and its minimalist style. We added the UTAS and AMC collaboration logo (bottom left) and the AMC games logo (top left), which were the client's requirements.
We kept the interactable buttons to the minimum to reduce screen clutter so that anyone using the simulator for the first time can navigate the menus easily. The Start and “Exit” buttons are fully working as intended. The start button loads into the “Select Mission Objective” Menu, and the exit button closes the simulator. The settings button has not been implemented yet, but it is planned for Agile cycle three. It will open into a menu with the usual general settings, such as display mode and sound. It was also designed to bring you back to the title menu at any point on any screen by pressing “ESC”.



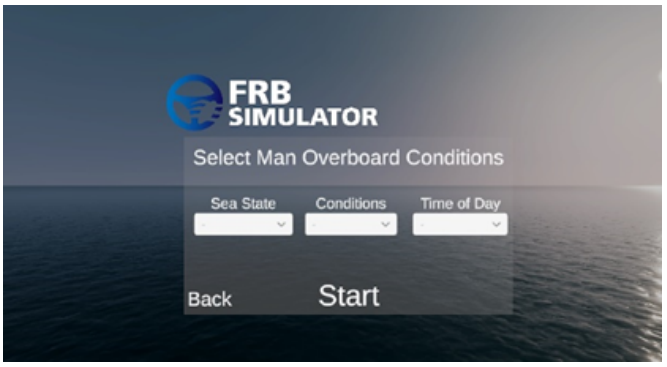
Mission Objective Menu

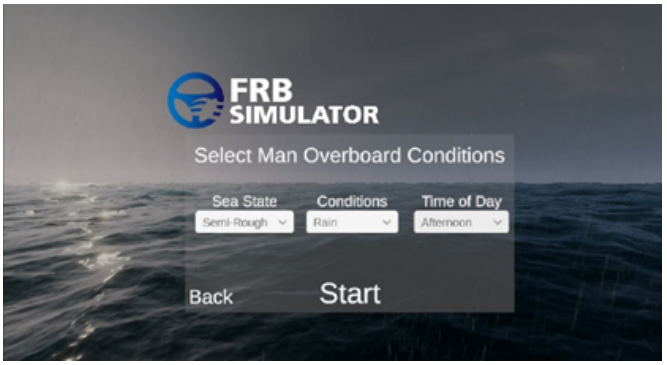
This Menu page consists of 2 interactable aspects:
The man overboard select button loads into the “Condition Select menu” for the man overboard mission.
The pacing Exercise select button loads into the “Condition Select menu” for the pacing exercise mission.

We kept the AMC games logo and the title for this menu to maintain unity alongside all the interfaces. The two interactable buttons are fully implemented and will open the “Condition Select menu”.

Condition Selection Menu

This menu page consists of 5 interactable aspects:
The Sea State drop-down, this lets you set the desired sea state from presets.
Condition drop-down, which enables you to select the desired weather condition from the list of presets.
The time of Day drop-down, that allows you to set the time of day (This will be swapped for a “Wind” option in cycle three).
The back button sends you back to the “Mission Objective menu”.
The start button starts the selected mission with the chosen conditions.





Design philosophy

Consistency across menus

Consistency in design ensures that users can predict where elements will be and how they will behave, creating a smoother learning curve. In the Fast Rescue Boat (FRB) simulator, consistency across the title screen, mission objective menu, and condition selection menu allows users to intuitively understand how to interact with the simulator regardless of what menu they are on.

Layout: Every menu follows a similar structure as navigation elements are placed in the same position across all setup screens.
Visual Cues: All menus have similar button styles, icons, and labels, For example, the "Start" button has the same colour, size, and position across all stages of the simulation setup.
Feedback Consistency: Whether selecting a mission or a sea state, the same feedback mechanism is employed which is having words underlined to indicate that you are hovering over them and images change shade to indicate a confirmed selection.

Minimalist approach

The user base for the FRB simulator includes instructors and trainees, often under time constraints. A cluttered interface can hinder their ability to quickly and accurately set up the simulator. A minimalist UI avoids overwhelming users with unnecessary options and focuses on the core functionalities.

Fewer Interactable Elements: Only the essential actions, such as "Start," "Select Mission," and "Condition Settings," are displayed, while advanced settings (like sound or graphics) will be moved to a separate settings menu.
Simplified Navigation: Each screen is designed with a clear focus. For instance, the Mission Objective screen only displays options related to the mission (e.g., Man Overboard or Pacing), with no overlapping condition settings.
Whitespace: Ample spacing around buttons and dropdowns minimises cognitive load and reduces the chance of misclicks.

Visual Hierarchy

A clear visual hierarchy guides users' attention to the most important tasks. This is essential in a training environment where users need to complete specific tasks efficiently.

Grouping Related Elements: Elements that are related (e.g., sea state, weather conditions, and wind settings) are visually grouped together, making the interface easier to scan and navigate.
Use of Color and Contrast: High-contrast elements, such as a bold "Start" button, stand out against a neutral background. Similarly, selected menu options can change colour to clearly indicate active choices.

Functionality

Architectural Decisions

In developing the Fast Rescue Boat (FRB) Partial Mission Simulator, we made viral architectural decisions to ensure that the simulator is both user-friendly and meets the needs of AMC instructors. The conditions (weather, waves, wind) are set up before each mission begins. This design choice allows instructors to configure the environment using preset conditions accessible via dropdown menus. This approach streamlines the setup process, reducing the need for instructors to manually adjust every tiny detail, which enhances usability and ensures consistent training scenarios.

Progress on Core Functional Requirements

Significant progress has been made in developing the core functionalities of the simulator. The boat now responds to different wave conditions, which, while requiring further refinement, is successfully moving in sync with the wave dynamics. Environmental conditions like weather and waves can now be selected and loaded into the main mission scenes. Although wind controls are still in the testing phase, the foundational elements are in place, and they are currently undergoing fine-tuning in a separate test environment. The primary missions, including pacing and man overboard, are fully operational, with dynamic environmental effects that enhance the realism of the simulation. However, integrating the boat's reaction to waves and the wind effects into the main scene is pending further adjustments to ensure a natural and realistic feel.

Technical Challenges

One major challenge has been achieving a natural feel for the simulation. Integrating the environmental elements—weather, waves, and wind—to interact naturally has been complex. Ensuring that wind affects clouds and waves while realistically influencing the boat's movement has required extensive testing and iteration. Although the waves now affect the boat, achieving a more natural and convincing interaction is an ongoing challenge. These challenges have required creative problem-solving and extensive testing to refine the simulation's feel and ensure it meets the expectations of realism.

Testing and Validation

Both automated and manual testing methods have been employed to validate the simulator's functionality. Integrating environmental factors, such as wave dynamics and wind effects, has undergone rigorous testing in a controlled environment to ensure that each element behaves as expected before being integrated into the primary simulation. This testing has been crucial in identifying areas that need further refinement, such as the boat's movement in response to waves and the overall realism of the environmental interactions.

User and Client Feedback Integration

Client feedback has played a significant role in shaping the simulator's functionality. For example, following client discussions, the decision was made to fix the time of day at midday, allowing for greater control over wind conditions instead. This shift in focus has led to adjustments in the simulator's development, such as refining the wind controls and ensuring they accurately reflect the client's requirements. Additionally, minor tweaks, such as the placement of connection lines and crane hooks in the pacing mission, have been made to better align with the client's expectations.

Future Development

The upcoming Agile cycle will focus heavily on fine-tuning the simulator to achieve the desired realism and user experience. This includes finalising the integration of the environmental controls into the main scene, ensuring that the boat's interaction with waves and wind is as natural as possible. Additionally, efforts will be directed towards connecting the simulator to the actual simulator controls, refining mission details, and preparing comprehensive documentation to guide the client in using the system effectively.

Use of Best Practices

Throughout the development process, best practices in technical development have been applied to ensure high-quality outcomes. This includes adhering to coding standards, utilising design patterns supporting modular and maintainable code, and following an iterative development process that allows continuous feedback and improvement. The team has leveraged their experience from previous units to overcome challenges and deliver a functional, user-friendly simulator that meets the client's needs.

User Testing

The objective of user testing is to evaluate the *Perceived Usefulness* and *Perceived Usability* of the Fast Rescue Boat (FRB) Partial Mission Simulator. This process is critical to ensure that the simulator meets the needs of its target users (instructors and trainees) and provides an effective, user-friendly interface.

Methodology

Test Participants:

- Five users participated in the testing phase, which included three AMC staff and two family members. This selection provided a broad range of feedback from both users that know what we were creating and people that hadn't seen it before.

Testing Environment:

- The tests were conducted in a controlled lab setting, with participants completing the testing on a standard desktop configuration, using the simulator's menus and interface to set up and run training missions.

Test Scenarios:

- **Scenario 1:** Selecting and starting the "Man Overboard" mission.

- **Scenario 2:** Customising environmental conditions using the condition selection menu (e.g., adjusting sea state, weather).
- **Scenario 3:** Completing a training session and exiting the simulation.

Usability Metrics:

- **Task Completion Rate:** Percentage of users who successfully completed each task without assistance.
- **Time on Task:** The time taken by users to complete key tasks, such as selecting a mission and adjusting conditions.
- **Error Rate:** Number of errors encountered (e.g., selecting the wrong condition or navigating to the wrong menu).
- **User Satisfaction:** After completing each task, participants rated their satisfaction using a 5-point Likert scale, and post-task interviews gathered qualitative feedback on their experiences.

Outcomes

Task Completion Rate:

All participants were able to complete the mission selection process, though one person encountered minor issues with selecting environmental conditions which was an outlier that can be attributed to unity starting the system incorrectly and everyone was able to successfully complete the scenario.

Time on Task:

On average, it took users 1-2 minutes to complete the entire mission setup, and then on average it took users 4 - 6 minutes to complete the man overboard mission which is considered an acceptable time frame based on feedback.

Error Rate:

The only error occurred during the Condition Selection phase, where one user's ocean condition select drop down didn't work correctly after restarting the Unity player; it started working fine; this was an outlier that in testing afterwards we weren't able to replicate.

User Satisfaction:

The average satisfaction score was 4/5. AMC Staff found the simulator useful and complemented us on the progress and how it reflects the real scenario, but the family members suggested adding tooltips or additional text to explain unfamiliar terminology as they were not wholly knowledgeable on the simulator or the mission scenario.

Conclusions

The overall feedback indicates that the simulator is highly usable but still needs work on how realistic the FRB actually feels and sounds in the water. Based on user feedback, improvements will focus on modifying the controls to make the FRB feel even more realistic and the addition of quality of life additions like sound implementation and improvements.

Technical Testing

The goal of technical testing is to validate the *functionality*, *stability*, and *performance* of the Fast Rescue Boat (FRB) Partial Mission Simulator. This ensures that the simulator behaves as expected across various conditions and meets the technical requirements laid out by the client.

Methodology

Unit Testing:

- Each core functionality (e.g. boat movement, environmental condition control) was tested individually to ensure proper implementation. This involved testing how the boat reacts to preset sea states.

Integration Testing:

- After unit tests were completed, integration testing ensured that different systems (e.g. boat physics and environmental dynamics) worked seamlessly together. This was critical for validating that the simulator accurately reflects the boat's movement in various weather conditions.

Performance Testing:

- **Frame Rate Monitoring:** Frame rate consistency was measured under different conditions (e.g., calm waters vs. rough seas).
- **Memory Usage:** Tests were run to assess how much memory the simulator consumes during both idle and mission runtime phases.
- **Stress Testing:** The simulator was subjected to extreme weather conditions (high wind and wave intensities) to observe how well it handled increased computational loads without crashing or slowing down.

Bug Tracking and Resolution:

- Bugs were tracked using a separate discord channel which we categorised based on severity (e.g., minor visual glitches, critical mission errors).

    - High-priority bugs, such as improper boat movement under certain wave settings, were resolved before the next development cycle, ensuring smoother interactions between environmental and boat dynamics.

Outcomes

- **Frame Rate:** The simulator maintained an average frame rate of 120 FPS under normal conditions and dropped to 100 FPS under extreme stress conditions. While this drop is within accountability based on test system specifications, future optimizations may be required for high-end scenarios and for running on machines with less power.
- **Memory Usage:** The simulator remained stable, with no significant memory leaks detected during prolonged sessions. Average memory usage was 2.5GB, which is within acceptable limits for the target system specifications.
- **Integration Success:** The environmental factors, including weather, waves, and wind, interacted correctly with the boat's movement, ensuring realism in all test scenarios. However, further implementation of the wind effects is required to achieve more natural interactions in extreme conditions.

Conclusions

The technical testing phase demonstrated that the simulator is functional, stable, and capable of handling complex environmental interactions. Minor performance optimizations and adjustments to the boat's response to extreme weather will be addressed in the next development cycle. No critical technical issues were identified, allowing the project to proceed to the next stage without major delays.

Client Feedback

Feedback Elicitation Methodology

To ensure that the Fast Rescue Boat (FRB) Partial Mission Simulator aligns closely with the client's expectations, we conducted a formal, scheduled meeting with key members of the AMC Search team. During this meeting, we showcased the progress made in Agile Cycle 1, demonstrating the current features and functionality of the simulator. This was followed by an in-depth discussion where the client provided feedback on the accuracy and realism of the simulation, highlighting areas that required further refinement. The meeting was precious as additional members of the AMC Search team were present, providing more detailed insights into how the simulator differed from real-world operations.

Key Feedback Received

The client provided several critical pieces of feedback during this session:

- **Time of Day Condition:** The client requested that the time of day in the simulation be fixed at midday, removing the need for multiple time-of-day settings. This change allows the client to focus more on controlling other environmental variables, particularly the wind conditions.
- **Wind Condition Control:** The client expressed the need for more granular control over wind conditions, including the ability to adjust wind direction and intensity. This feedback was prioritised for implementation in the next development phase.
- **Pacing Exercise Adjustments:** The client noted inconsistencies in the pacing exercise, specifically that the line used during the training was incorrectly positioned. In real-life scenarios, the line should extend further along the boat to align under the crane hook when pulled back, which was not accurately reflected in the current simulation.

Response to Feedback

In response to the feedback received:

- **Time of Day Adjustment:** We promptly adjusted the simulator to lock the time of day at midday. Since the framework for different times of day was already in place, this modification was straightforward, involving only the deactivation of the other time settings.
- **Wind Condition Development:** The wind control feature, now a priority, is currently in the testing phase. This feature will allow the instructor to modify wind conditions dynamically, reflecting the client's need for a more realistic and customisable training environment.
- **Pacing Exercise Refinement:** We have moved the line further along the ship to ensure that when the FRB is connected, it aligns correctly under the crane hook, mimicking real-life operations. Additionally, we are enhancing the crane and hook connection details to reflect better the timing and accuracy required in actual training scenarios.

Impact on Development

These changes have been integrated into our development process with minimal impact on our timeline, as we are currently ahead of schedule. The adjustments to the time of day setting and the pacing exercise required relatively minor modifications, while the wind condition feature is progressing as planned within the testing environment. These developments ensure that the simulator remains on track to meet all client requirements without delays.

Challenges in Addressing Feedback

We did not encounter significant challenges in addressing the client's feedback. The time of day adjustment was straightforward, and the development of wind condition controls, while technically complex, is progressing well in the testing phase. The feedback on the pacing exercise required more detailed adjustments, but these were within the scope of our current capabilities.

Best Practices in Feedback Elicitation

All client meetings are thoroughly documented, and all team members participate to understand the client's needs comprehensively. This collaborative approach ensures that feedback is effectively communicated and implemented. By following best practices in feedback elicitation, we maintain a strong alignment between the client's expectations and the simulator's development.

Plans for Ongoing Feedback

We plan to continue engaging with the client regularly, aiming for at least one formal feedback session per month, potentially increasing to twice a month as needed. These sessions will allow us to continuously refine the simulator based on the client's evolving needs and ensure that all features are developed to their satisfaction.

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Quality and Compliance

During Agile Cycle 2, our team has remained committed to meeting the quality and compliance requirements outlined in our Planning Report. The client's focus on utilising the High Definition Render Pipeline (HDRP) to achieve high realism in the Fast Rescue Boat (FRB) Partial Mission Simulator has been a guiding principle throughout the development process. Here's how we have ensured adherence to these requirements:

Adherence to HDRP Standards

One of the critical quality requirements specified by the client was the use of HDRP to create a visually realistic environment without concern for system performance limitations. This directive allowed us to fully leverage HDRP's capabilities, including advanced lighting, shadows, and texture details, to create an immersive simulation experience. Our design decisions have consistently aligned with this requirement, ensuring that every element—from the boat models to the environmental conditions—reflects the high fidelity that HDRP offers.

Realism in Environmental Simulation

Another critical quality aspect for the client is the realism of environmental conditions, including weather, waves, and wind. In Agile Cycle 2, significant progress has been made in refining these elements to enhance the overall realism of the simulation. Integrating dynamic weather conditions, accurate wave behaviours, and realistic wind effects ensures that the simulator provides an authentic experience that closely mimics real-world scenarios. These developments meet the client's expectations and align with industry best practices for creating high-quality, immersive simulations.

Consistency and Continuous Improvement

We have consistently focused on realism and high-quality outputs throughout Agile Cycle 2. The client's feedback has been instrumental in guiding our adjustments, such as refining the pacing exercise and improving the environmental interactions. By implementing these changes while staying true to the HDRP and realism requirements, we have ensured that the simulator's quality remains high and continues to evolve in line with client expectations.

Compliance with Technical Specifications

All technical prototype outcomes during this cycle have adhered to the compliance standards in the Planning Report. This includes meeting specific requirements for environmental controls, such as the newly added wind condition feature, and ensuring that all elements are compatible with the HDRP framework. By prioritising these compliance aspects, we have ensured that the simulator meets and exceeds the client's expected technical specifications.

Future Quality Assurance Measures

As we move into the next Agile cycle, we will continue prioritising quality and compliance by fine-tuning the simulator's realism and ensuring that all new features align with the client's high standards. Regular quality assurance testing and ongoing client feedback sessions will be vital to maintaining and enhancing the simulator's quality.

Review of progress and Required changes

Alignment with Project Schedule

The development and testing tasks outlined for Agile Cycle 2 have generally aligned well with the initial project schedule. As reflected in the project plan, major tasks such as Advanced Weather System Integration and Interface and Feedback Enhancement

were successfully completed, with both Man Overboard Scenario implementation and the User Interface refinements progressing smoothly.

Advanced Feature Integration:

- The advanced weather system, including waves and wind control, has been integrated into the simulator. However, the implementation of the granular wind control feature is still undergoing testing. This aligns with the projected schedule, which allocates time for testing and refining the system in the next iteration (Cycle 3).
- The Man Overboard scenario is fully operational, meeting the timeline set for Agile Cycle 2.

Interface and Feedback Enhancement:

- Significant progress was made in refining the UI to reflect the client's feedback, particularly separating the condition selection and mission objectives into distinct menus. The testing and refining of feedback mechanisms were carried out, with user testing feedback being integrated into the interface improvements.
- The UI features and feedback mechanisms align with the schedule, as UI enhancements were completed without delays.

Scenario Testing and Refinement:

- Alpha testing of the Man Overboard and Pacing scenarios began as planned, ensuring that all core features function as expected. Based on the feedback, certain adjustments were made, such as repositioning the line used during the pacing exercise to better align with real-world scenarios.
- These adjustments have had a minimal impact on the project timeline, as these refinements were incorporated efficiently, allowing testing to proceed as scheduled.

Overall, the team remains ahead of schedule, with no major delays or deviations from the project plan. The tasks completed during this cycle align well with the original schedule, and any adjustments requested by the client were integrated without significant disruptions.

Changes to Requirements:

Several requirements evolved during Agile Cycle 2, based on both client feedback and technical testing:

Time of Day Condition (Fixed to Midday):

- Based on client feedback, the time of day control was removed and the time is now fixed to midday. This change was relatively minor and did not require substantial additional effort. As a result, it had no significant impact on the project timeline, and development remained on schedule.

Wind Condition Control:

- The client requested more control over wind direction and intensity. This has been prioritised, and while the basic wind control features have been developed during Agile Cycle 2, fine-tuning and implementation is expected to continue into the next iteration.
- Adjusting the Requirements Traceability Matrix (RTM) to include these additional wind control features has been planned without altering the overall timeline significantly.

Pacing Exercise Adjustments:

- The client's feedback regarding the alignment of the leader line and how the FRB should approach during the Pacing exercise was incorporated into the scenario. This refinement was successfully implemented and tested within Agile Cycle 2, These changes were handled within the existing project scope and did not require modifications to the schedule.

Change Log and Gantt Chart Adjustments:

Requirement Additions:

- Wind Control: The wind condition control features have been expanded to include direction and intensity adjustments. These new requirements were added to the RTM during Agile Cycle 2, with final testing and integration scheduled for Agile Cycle 3.

No Major Schedule Adjustments:

- The current Gantt chart reflects that all tasks for Agile Cycle 2 have been completed on time, with the advanced features and scenario testing progressing as planned.
- For Agile Cycle 3, tasks such as Beta Testing and Bug Fixing and Finalising Environmental Dynamics are scheduled to begin on time. Since the team is ahead of schedule, these tasks are expected to be completed within the designated time frame.

Application of Best Practices:

Integration of Client Feedback:

- The development process in Agile Cycle 2 followed best practices for client feedback integration. Regular feedback loops ensured that adjustments, such as the time of day setting and pacing exercise alignment, were implemented promptly. This helped maintain a strong alignment with the client's evolving needs.

Testing and Refinement:

- Following industry standards for technical and user testing, the simulator's UI, weather system, and mission scenarios were rigorously tested during this cycle. Issues uncovered during testing were quickly addressed, ensuring minimal disruption to the project timeline.
- Best practices from previous units, such as iterative development and agile testing methods, were applied to ensure that critical features were tested and validated throughout the development cycle.