

臻善圈 決賽隊伍 提案摘要

PROJECT SUMMARIES OF WIT FINALISTS



無限圈
Infinite Circle

於 Mode Selector 加設小工具，防止車長選擇錯誤的行车模式 Installation of a tool on Mode Selector to prevent the Train Captain from selecting a wrong driving mode

成立日期
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問題剖析

- 列車車長執行日常車務工作時，會因為特別車務運作需要而選用半自動模式 Coded Manual Mode (CM 模式) 行车。
- 過往曾經有不少車長在轉換 CM 模式時，錯誤選取限速手控模式 Restricted Manual Mode (RM 模式) 行车而發生未獲授權下使用限速手控模式 (Unauthorized RM) 事件。
- 錯誤選用 RM 模式，可導致列車駛越危險信號燈 (Signal Passed at Danger)、撞毀道岔 (剗波口)、列車駛離路軌等，嚴重影響列車服務安全，以及引致不必要的延誤和設備損毀。

改善方法

- 於模式選擇器 (Mode Selector) 的顯示版面下方位置，加設一個以磁石運作的 RM 顯示器。
- 當列車車長選擇 RM 模式 (包括 Forward 或 Reverse Position) 時，RM 顯示器便會顯示為 "RM"，讓列車車長察覺到自己選用了 RM 行车模式，採取行動防止 Unauthorized RM 事件發生。

總結成果

有形得益

- 磁石裝置製作成本 (每個)：港幣 205 元，每列列車需要 2 個磁石裝置 = 205×2 = 港幣 410 元
- 2022 年 6 月至 12 月期間共發生 7 宗 Unauthorized RM 事件，以每宗事故平均處理成本港幣 12,410 元計，即可節省港幣 86,870 元
- 裝置亦可為公司避免因 Unauthorized RM 事件 (衝燈、剗波口、設備損壞、列車安全) 由「鐵路事故懲罰機制」所產生的潛在成本 (損失往往以數百萬元計)

無形得益

- 創造價值：增設磁石裝置使車長看見 Mode Selector 的位置，減少他們的顧慮，讓他們更能專注於工作，提高運作效率及列車安全，為公司提升專業形象。
- 優質服務：減低錯誤選擇 RM 模式的機會，令列車服務更安全、穩定和順暢。
- 勇於進取：圈員主動提出工作環境的安全隱患及潛在風險，尋求改善方案。
- 互敬互重：圈員分擔不同崗位，透過溝通和合作，發揮互敬互重的精神。



Problem Analysis

- When the train captain performs daily train operation work, he chooses the semi-automatic mode, Coded Manual Mode (CM mode), to operate the train according to special operational needs for the train
- In the past, many train captains mistakenly selected the Restricted Manual Mode (RM mode) when switching to CM mode and drove in the Restricted Manual Mode (RM) without obtaining authorization.
- Wrongly selecting the RM mode can cause the train to pass through the danger signal (Signal Passed at Danger), run through the point (point run through), and the train to leave the track, etc., seriously affecting the safety of train services, and causing unnecessary delays and equipment damage.



Improvement Methods

- Add a magnet-operated RM display below the Mode Selector display panel.
- When the train captain selects the RM mode (including Forward or Reverse Position), the RM display will display "RM", notifying the train captain that he has selected the RM driving mode and take action to prevent the Unauthorized RM event from occurring.



Summary of Achievements

Tangible Benefits

- Production cost of magnet device (each): HK\$205, each train requires 2 magnet devices = \$205x2 = HKD 410
- 7 Unauthorized RM incidents occurred from June to December 2022. Based on the average handling cost of each incident of HKD 12,410, HKD 86,870 can be saved in total
- The device can also help the company avoid potential costs (losses often amount to millions of dollars) in "Railway Accident Penalty Mechanism" caused by Unauthorized RM incidents (incompliance with traffic signals, point run through, equipment damage, train safety)

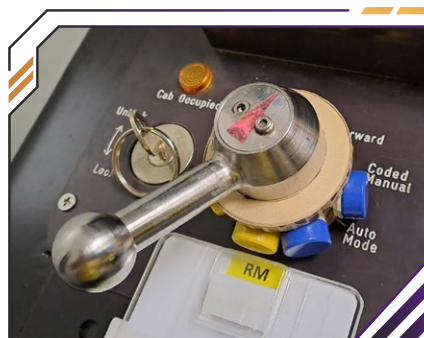
Intangible Benefits

- Enhances company reputation: Adding a magnet device allows train captains to see the location of the Mode Selector, reducing their concerns and allowing them to focus more on their work, improving operational efficiency and train safety, and enhancing the company's professional image.
- Improves service quality: Reduces the chance of incorrectly selecting the RM mode, making train services safer, more stable and smoother.
- Enables employee proactiveness: Team members proactively search for hidden safety hazards and potential risks in the working environment and seek improvement solutions.
- Strengthens mutual respect: Team members have different roles and responsibilities. Together, they develop the spirit of mutual respect through communication and cooperation.



當車長選擇 Shutdown/Standby/CM/Auto模式時，在 Mode Selector 上的磁石與 RM 顯示器上的磁石異極相吸，故此不會顯示 RM 模式。

When the Train Captain selects Shutdown/Standby/CM/Auto mode, the magnet on the Mode Selector and the magnet on the RM display attract each other via opposite poles, so the RM mode will not be displayed.



當車長選擇 Forward/Reverse (即 RM 模式) 時，在 Mode Selector 上的磁石與 RM 顯示器上的磁石同極相拒，故此顯示 RM 模式。

When the Train Captain selects RM mode in Forward/Reverse, the magnet on the Mode Selector and the magnet on the RM display are of the same polarity and repel each other, so the RM mode is displayed.



裝上磁石裝置令車長在選擇 RM 模式時更「顯而易見」。

Installing a magnet device makes it more obvious and provides clearer instructions for the Train Captain to select RM mode.