



## Intellex Consulting services

Locations: UK, UAE and India

# System Assurance of Platform Screen Doors for Generic and Specific Application

System Engineering, RAMS, System Assurance Consultancy & Training

Website: [www.intellexuk.com](http://www.intellexuk.com)



# Project Overview

## **PLATFORM SCREEN DOORS**

### **Scope of Work:**

- Creating and updating deliverables as per EN 50129 to achieve SIL-2 certification for an update to the Generic Application of the PSD product for delta changes.
- Conducting HAZOP workshops for identification of hazards for both generic as well as specific Application .
- Creating RAMS(Reliability ,Availability ,Maintainability and Safety) deliverables for specific Application .
- Creating Project planning deliverables as well as implementing the scheduled through Primavera as a part of specific application.
- Creating Software deliverables as per EN 50128 for the specific Application .
- Obtaining certificates for EMC, shock load, structural integrity, and IP ratings for Platform Screen Doors by conducting these tests in a third-party lab. .

**Project Duration : 9 months (June 2024 - February 2025)**



# Project Overview

## **Project Background & Context**

- Platform Screen Doors (PSDs) provide a barrier between the track and platform, enhancing passenger safety by preventing accidental falls and reducing unauthorized access to the track area.
- With PSDs in place, managing crowd control on platforms is more straightforward. PSDs prevent overcrowding close to the track, allow smoother boarding and alighting processes, and enable safer evacuation procedures if necessary.
- PSDs operate in synchronization with train doors, opening and closing simultaneously to allow safe boarding and alighting.
- The signaling interface with the Central Interface Panel (PSC) is implemented through a vital hardwire circuit, which give SIL-4 commands, ensuring high safety and reliability standards.
- The PSD system installed is designed to accommodate a 6-car train, whereas earlier system was designed for 3-car trains, indicating scalability in platform infrastructure.
- The earlier PSD system was designed for a 2-platform configuration only, but the updated system now supports a 3-platform configuration, allowing for greater flexibility in station layouts.



# Project Overview

- The Intellex RAMS Assurance Consulting Pvt. Ltd. was awarded a contract by an Indian Client to deliver the system assurance works for Generic and Specific Application of Platform Screen Doors and demonstrate the safety and reliability of the system.



# Case Study Highlights

## **Overview of RAM and Safety Analyses conducted for Platform Screen Doors(PSD)**

The following RAM and safety analyses were performed by Intellex for PSD for Generic and Specific Application:

- ❑ Generic Application
  - Plans – System Development Plan, Safety Assurance Plan, RAM Plan, Quality Assurance Plan, Configuration Management Plan, System Verification & Validation plan .
  - Hazard Analysis – Preliminary Hazard Analysis (PHA), System Hazard Analysis (SHA), Interface Hazard Analysis (IHA), Hazard Log
  - System Requirement Specification , Software Requirements Specification, Hardware Requirements Specification .
  - Failure Mode Effect and Criticality Analysis (FMECA), Fault Tree Analysis (FTA)
  - PSD Validation Report
  - Generic Application Safety Case
  - RAM Analysis & Prediction Report.



# Case Study Highlights

## Overview of RAM and Safety Analyses conducted for Platform Screen Doors(PSD)

The following RAM and safety analyses were performed by Intellex for PSD for Generic and Specific Application:

- ❑ Specific Application
  - Plans – System Assurance Plan , Safety Plan , RAM Plan and RAM Demo Plan .
  - Hazard Analysis – Preliminary Hazard Analysis (PHA), Sub-System Hazard Analysis (SHA), Interface Hazard Analysis (IHA), Hazard Log
  - Failure Mode Effect and Criticality Analysis (FMECA) for RAM & SAFETY, Safety Critical Item List, Reliability Critical Item List and Quantitative Risk Assessment including Fault Tree Analysis (FTA)
  - Specific Application Design Safety Case and Final Safety Case.
  - RAM Analysis & Prediction Report, Reliability Block Diagrams ,RAM Allocation Report ,Spare Parts Report ,Traceability Matrix, RAM Report, RAM Demonstration Report and Monthly RAM Performance Report .



# Case Study Highlights

## **Challenges Encountered**

The following challenges/issues were faced while performing the system assurance of PSD for Generic and Specific Application :

- Difficulty in understanding the design and the whole process in the initial phase of the project
- Difficulty in contacting the third party lab for completing the testing of PSD as a part of Specific application
- Lack of Proper coordination in the ISA team and Confusion over the documents submitted to ISA
- Delayed in the certification process from ISA's side



# Case Study Highlights

## **Resolutions Adopted**

The following strategies were adopted to overcome the bottlenecks in PSD Project:

- Conducted meetings with design team of client to understand the system and delta changes in more detail Clarified project scope through detailed discussions and documentation.
- Conducted HAZOP by visiting client site for generic as well as specific to identify the relevant hazards to the PSD system
- Visited 3<sup>rd</sup> party lab to finalize the testing of PSD
- Prioritized key deliverables to meet deadlines without compromising quality.
- Conducted multiple meetings with ISA to avoid the confusion over the documentation and explained the detailed design to ISA and the scope of the delta change .
- Witnessed PSD testing and validated all the requirements arised from the delta changes



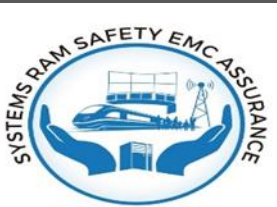


# Conclusion

## **Lessons Learnt**

The following lessons were learnt during the System Assurance of Platform Screen Doors for generic application and specific application :

- Conducting HAZOP sessions to identify hazards for generic and specific application of PSD.
- Developing and delivering RAMS (Reliability, Availability, Maintainability, and Safety) and deliverables.
- Implementing SIL-2 certification requirements for the delta changes of Platform Screen Doors.



*Thank you*

# Contact us to discuss where we can assist.

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