



2025

BRICS SKILLS COMPETITION

(BRICS+ FUTURE SKILLS & TECH CHALLENGE)

Platform Door Control and Debugging Technology
BRICS-FS-50

Test Project
(International Finals)

Oct. 2025



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1 Competition Form

This event is a competition with each team consisting of two contestants.

2 Competitive events

This event consists of theoretical and practical examinations.

Theoretical examination shall be performed on a computer. Practical examination consists of three modules, all of which shall be completed by players in a specified sequence.

During the competition, players will be provided with competition project documents, competition equipment, an instruction for equipment operation, and data source or other basic technical conditions required to ensure the independence and fairness of each module. This event consists of the following modules based on system operations of platform doors:

Module A: virtual patrol inspection of platform doors

Module B: troubleshooting of platform doors

Module C: debugging of the platform door system

Modules and scoring standard can be changed only when performance completion on site is made impossible and the chief experts approve such change.

A player who violates any OHSE requirements, or endangers himself or others, may be disqualified from the competition.

Results will be scored after players complete all competition tasks.

3 Competition modules and time

3.1 Competition time

The Platform Door Control and Debugging Technology event requires players to complete the tasks within 6 hours. See the table below for names of modules and time requirements.

Table of Time Allocation

No.	Modules	Time of Completion
1	Theoretical examination	60 min
2	Module A: virtual patrol inspection of platform doors	60 min
3	Module B: troubleshooting of platform doors	120 min
4	Module C: debugging of the platform door system	120 min

3.2 Competition modules

3.2.1 Module A: virtual patrol inspection of platform doors

3.2.1.1 Competition tasks

The system simulates a standard equipment layout of station platform door. The operational environment includes sliding doors, fixed doors, emergency egress doors, end doors, and other related devices. Practices include platform door operations, common fault handling, equipment maintenance and inspection/repair, etc.

Content of virtual patrol inspection

No.	Contents
1	Routine inspection of platform doors
2	Assistance in inspection and repair of the platform door system equipment
3	PSA inspection and repair of the platform door system equipment
4	PSL inspection and repair of the platform door system equipment
5	UPS inspection of the platform door system

3.2.2 Module B: troubleshooting of platform doors

3.2.2.1 Tasks

(1) This module is provided 120 minutes. Common platform door faults are preconfigured on the equipment. Players are required to identify the causes for faults based on the symptoms and the provided technical documentation. After a fault is located, players are required to perform repairs and confirm, through testing and commissioning, whether or not the equipment can work properly.

(2) Within the specified timeframe, players are required to wear and use PPEs properly, select tools and devices correctly, identify the platform door faults and find their locations, inspect and replace the failed devices, and document the failures and operations correctly upon the confirmation of troubles shot.

(3) Failure locations are preconfigured on the platform door system. Players are required to find and shoot the troubles in accordance with the platform door operation requirements and the Electric Diagram of Platform Door Control. Tasks (failure locations) will be extracted by the chief referee before the competition. After such extraction is confirmed, technical officers will perform failure setting and verification.

3.2.2.2 Task requirements

(1) Players shall identify the causes of the platform door system failure based on the observed failure and the schematic diagram.

(2) After the causes are identified, players shall select appropriate spare parts for replacement or repair. Such repair or replacement shall comply with the installation specifications.

(3) Players are required to use properly the tools and devices provided by the Event in the process of fault identification and repair. Reckless or improper operation that may injure or damage the equipment is prohibited.

(4) Upon the completion of troubleshooting, players are required to verify the functions of the equipment, which shall comply with the control logic. The equipment shall be restored to its proper working condition.

(5) Upon completion, players shall complete the Failure and Maintenance Record Form.

3.2.2.3 Failure and Maintenance Record Form for Platform Doors

Upon the completion of operations, the Failure and Maintenance Record Form shall be completed as required.

Failure and Maintenance Record Form (sample)

Time of start	____ (month) ____ (date), ____ (year), ____ (hour) ____ (minute)	No.	
Time of completion	____ (month) ____ (date), ____ (year), ____ (hour) ____ (minute)	Station No.	
Faults	Fault 1:		
	Fault 2:		
	Fault 3:		
Troubleshooting methods and results	Fault 1:		
	Fault 2:		
	Fault 3:		

3.2.3 Module C: debugging of the platform door system

3.2.3.1 Tasks

(1) This module is provided 120 minutes.

(2) Based on the Electrical Control Schematic Diagram and in compliance with technical requirements of automatic control, selection of electrical components required for the control circuit shall be performed.

(3) Based on the cognition and understanding of the operation principles of the platform door system and as required in the Electrical Control Schematic Diagram, wiring of signal feedback lines and control lines of PEDC in the PSC cabinet linking the SIG control panel and IBP control panel in the platform door system.

(4) The IBP panel and SIG control interface shall be configured as per the functional requirements. Upon the completion of configuration, control over platform doors can be successfully performed through the IBP panel and SIG control interface on the touchscreen.

(5) Controllers are programmed as per the function requirements. The operational workflows of the touchscreen interface are required to comply with the control logic of the platform door system, enabling feedback display of signals of platform doors.

(6) Players are required to perform debugging of the platform door system through the IBP panel control interface and the SIG signal control interface.

(7) Upon the completion of debugging operation, players shall complete the Equipment Debugging Record Form.

3.2.3.2 Task requirements

(1) Selection of electric components

- Players are required to select proper electric components according to the Electrical Control Schematic Diagram.

(2) Requirements for IBP Screen Configuration and PLC Control Program

- When the two-position self-lock selector switch on the IBP panel is set to the "Enabled" position, the IBP Enable Indicator lights up and PLC output Q0.0 is activated.

- With the IBP enable selector in the "Enabled" position, the door open button becomes operational. Pressing the door open button triggers PLC output Q0.1. The door open button is a self-resetting type

- With the IBP enable selector in the "Enabled" position, the door close button becomes operational. Pressing the door close button triggers PLC output Q0.2. The door close button is a self-resetting type.

- When the two-position self-lock selector switch (interlock release) is set to the "Enabled" position, the Interlock Release Indicator on the HMI screen lights up, and PLC output Q0.3 is activated.

- When PLC input I0.0 receives a signal, the PSL Enable Indicator on the HMI screen illuminates.

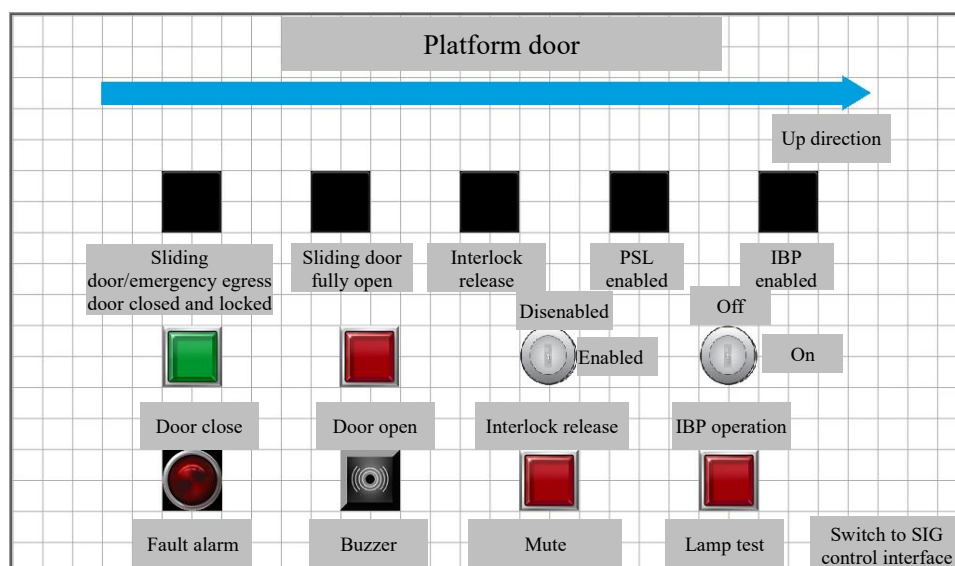
- When PLC input I0.1 receives a signal, the Sliding Door/Emergency Egress Door Closed & Locked Indicator on the HMI screen lights up.

- When PLC input I0.2 receives a signal, the Sliding Door Fully Open Indicator on the HMI screen lights up.

- When PLC input I0.3 receives a signal, the Fault Alarm Indicator on the HMI screen lights up, the buzzer built in the HMI screen sounds, and the buzzer indicator synchronizes its flashing with the buzzer.

- When the buzzer sounds, a self-lock mute button can be used to turn off and on the buzzer.

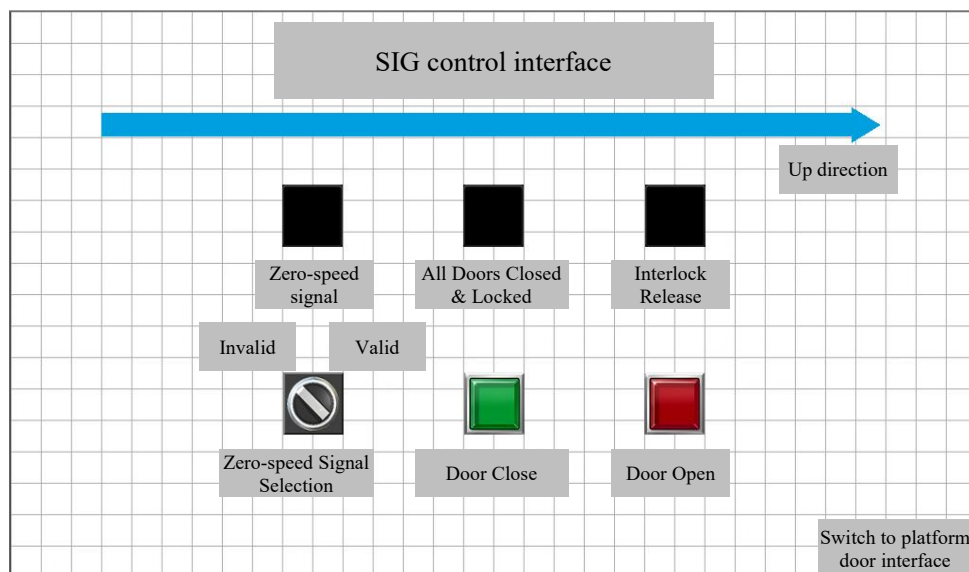
- When the button of the lamp test on the HMI screen is pressed down, all indicators on the HMI screen illuminate and the buzzer sounds.



Example of IBP control interface configuration

(3) Requirements for SIG Screen Configuration and Program



- The zero-speed signal is implemented via a two-position self-lock selector switch. When activated, the Zero-Speed Signal Indicator lights up.
- When the Zero-Speed Signal Indicator lights up, the door open button is operational. Pressing the door open button triggers Q0.5. This button is a self-resetting type.
- When the Zero-Speed Signal Indicator lights up, the door close button is operational. Pressing the door close button triggers Q0.4. This button is a self-resetting type.
- When PLC input I0.5 receives a signal, the "All Doors Closed & Locked" indicator on the HMI screen illuminates.
- When PLC input I0.6 receives a signal, the "Interlock Release" button indicator on the HMI screen lights up.
- The door open/close authority level in the SIG interface is lower than that in the IBP interface.





Example of IBP control interface configuration

(4) Requirements for control circuit wiring

- The installation and wiring of control circuit shall be performed in strict accordance with the Electrical Control Schematic Diagram.
- All circuits shall be installed at the proper locations as specified in the circuit diagram.
- All circuits shall be connected by aligning the wire markers with the wire numbers in the drawings.
- All set screws for wiring and mounting screws for electric components shall be tightened to the specified torque.
- No wire ends are allowed to be suspended in the air.
- Wires for components shall be free of any injury to insulation or exposure of copper core.
- A continuous wire shall directly connect two terminals without intermediate joints.
- All conductors shall maintain parallel routing without crossings, and shall never pass over the top of electrical components or terminal blocks.

Incorrect example: conductors crossed	Incorrect example: passing over a terminal strip
	

- Wire markers shall be as easily observed as follows: (1) full visibility to an inspector standing directly in front of the wiring panel; (2) consistent orientation for all markers on the same side of terminal blocks/relays (first digit toward the terminal base); (3) uniform spacing between marker sleeves and terminal bases.

Correct example	Incorrect example
	

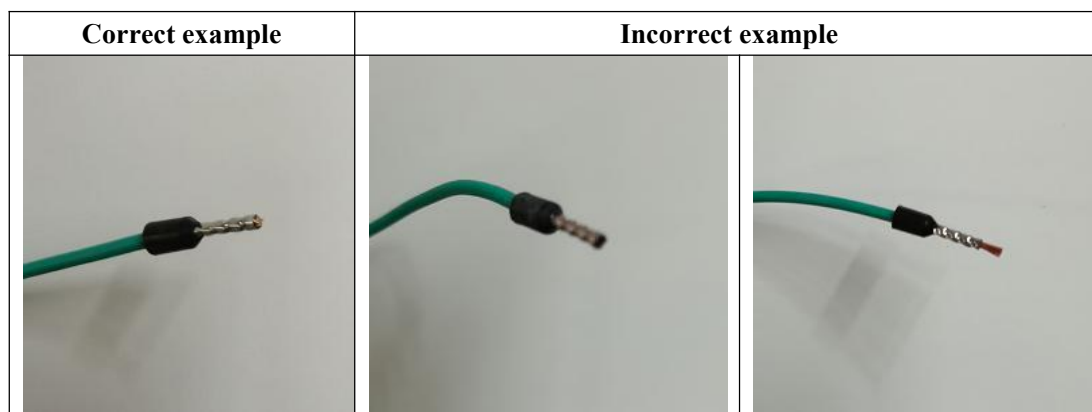
- Conductors terminated at terminal blocks shall maintain neat looped slack and provide length reserve equivalent to 3 re-termination cycles.

- Cables shall be cut to a proper length. Excessive length that causes overcrowding or folding in raceways shall be avoided. Cables shall not be too short to prevent strain (visible white stress marks at bends). Prior to cover installation, cables in free state shall not protrude above the raceway surface.

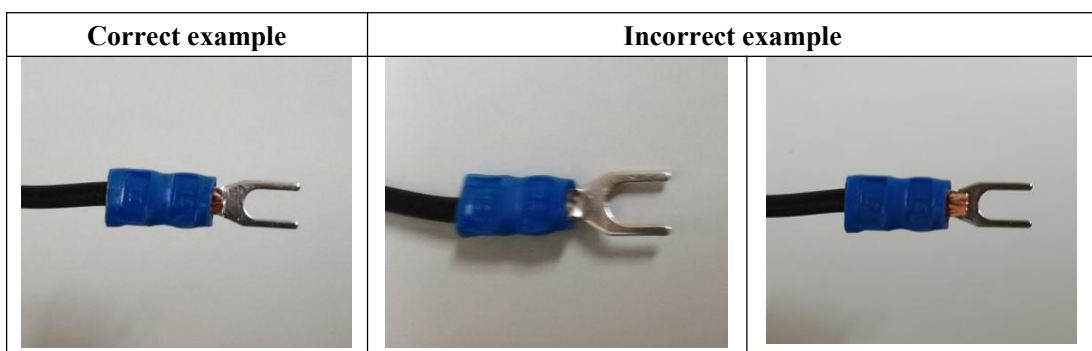
- After installation, all raceway covers must be securely closed, and no cable ties are permitted inside raceways. Additionally, discarded cable segments exceeding 200mm in length are prohibited.

- All PLC signal I/O terminals and terminal block connections shall be a crimped needle type (Model VE7508). The core of the crimped conductor shall

expose 0-0.5mm from the barrel terminal. Both insufficient and excessive exposure of conductor core shall constitute non-compliance.



- Signal wires and output circuits of relays shall be terminated with crimped U-type terminals (Model SV1.25-3 cold-press terminals). The core of the crimped conductor shall expose 0.5-1mm from the insulation sleeve. Both insufficient and excessive exposure of conductor cores shall constitute non-compliance.



(5) Requirements for functional debugging and verification of platform doors

① Debugging of IBP control functions

- Lamp test
- IBP panel enable switch function test
- IBP panel door open test
- IBP panel door close test
- IBP interlock release switch function test
- Lockout signal inspection

② Switching to SIG control interface

- Debugging of SIG system control functions
- Zero-speed Signal Selection switch function test

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- SIG door open function test
- SIG door close function test
- Switching to IBP panel control interface
- Interlock release function
- Lockout signal inspection

(6) Equipment Debugging Record Form

Upon the completion of debugging operation, players shall complete the Equipment Debugging Record Form.

Equipment Debugging Record Form (Sample)

Team No.				
Station No.				
No.	Test items	Test description	Test result	Remark
1	IBP control functions	Lamp test: <ul style="list-style-type: none"> ➤ “IBP enable” lights up; ➤ “PSL enable” lights up; ➤ “Sliding door/emergency egress door closed and locked” lights up; ➤ “Sliding door open” lights up; ➤ “Interlock Release” lights up; ➤ “Fault alarm” lights up; ➤ “Buzzer” lights up and gives an alarm; ➤ “Mute” lights up; 	Normal <input type="checkbox"/> Abnormal <input type="checkbox"/>	
2		“IBP Panel Enable” switch function test: <ul style="list-style-type: none"> ➤ Operate the IBP Panel Enable switch in the IBP control interface; ➤ When the switch is in the 'Disabled' position, the IBP Door Open/Close functions are deactivated, and the 'IBP Enable' indicator remains unlit; ➤ With the switch in Enable position, IBP Enable lights up. 	Normal <input type="checkbox"/> Abnormal <input type="checkbox"/>	
3		IBP panel door open test: <ul style="list-style-type: none"> ➤ When the IBP Panel Enable switch in the Enable position, press the Door Open button and the platform door opens. 	Normal <input type="checkbox"/> Abnormal <input type="checkbox"/>	
4		IBP panel door close test: <ul style="list-style-type: none"> ➤ When the IBP Panel Enable switch in the Enable position, press the Door Close button and the platform door is closed. 	Normal <input type="checkbox"/> Abnormal <input type="checkbox"/>	
5		IBP Interlock Release switch function test: <ul style="list-style-type: none"> ➤ Operate the Interlock Release on the IBP simulation system control panel to the Disable position and the Interlock Release indicator remains unlit. ➤ Operate Interlock Release to the Enable position and the Interlock Release indicator lights up. 	Normal <input type="checkbox"/> Abnormal <input type="checkbox"/>	
6		Lockout signal inspection: <ul style="list-style-type: none"> ➤ With the platform door open, the Sliding Door Open indicator lights up. ➤ With the platform door closed, the Sliding Door/Emergency Egress Door Closed & Locked indicator lights up. 	Normal <input type="checkbox"/> Abnormal <input type="checkbox"/>	
7		Switching to SIG control interface: <ul style="list-style-type: none"> ➤ Operate the SIG Control Interface 	Normal <input type="checkbox"/>	

		button and the screen can be switched to SIG Control Interface.	Abnormal <input type="checkbox"/>	
8	SIG system control function test	Zero-speed Signal Selection switch function test: ➤ When the Zero-Speed Signal Selection switch on the SIG simulation system control panel is placed on the Invalid position, the Zero-speed Signal indicator remains unlit. ➤ The Door Open button fails to send a command of opening the door, rendering both opening and closing functions inoperative. ➤ With the Zero-speed Signal Selection switch on the Valid position, the Zero-speed Signal indicator lights up.	Normal <input type="checkbox"/> Abnormal <input type="checkbox"/>	
9		SIG door open function test: ➤ With the Zero-speed Signal Selection switch on the Valid position, operate the Door Open button on the SIG simulation control panel and the platform door opens.	Normal <input type="checkbox"/> Abnormal <input type="checkbox"/>	
10		SIG door close function test: ➤ With the Zero-speed Signal Selection switch on the Valid position, operate the Door Close button on the SIG simulation control panel and the platform door is closed.	Normal <input type="checkbox"/> Abnormal <input type="checkbox"/>	
11		Switching to IBP panel control interface: ➤ Press down the IBP panel control interface button and the screen can be switched to the IBP panel control interface.	Normal <input type="checkbox"/> Abnormal <input type="checkbox"/>	
12		Interlock release function: ➤ Operate the Interlock Release on the PSL panel, the Interlock Release indicator on the SIG control panel lights up.	Normal <input type="checkbox"/> Abnormal <input type="checkbox"/>	
13		Lockout signal inspection: ➤ The SIG system control interface can receive and display the signals from the platform doors. ➤ When the platform door opens, the All Doors Closed & Locked indicator remains unlit. ➤ When the platform door is closed and locked, the All Doors Closed & Locked indicator lights up.	Normal <input type="checkbox"/> Abnormal <input type="checkbox"/>	

