HKIA Experience – From ICAO SARPS to Aerodrome Licensing Requirements (GRF as an illustration)

17 February 2025

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GRF Development Roadmap

Date	Details
Dec 2018	APSD/CAD informed AAHK the application of GRF on 5 November 2020 and details stipulated in Annex 14, Vol 1 (8th Edition, July 2018) and PANS-Aerodrome (2nd Edition, 2016)
Mar 2019	AAHK joined the ICAO/ACI Symposium on Implementation of the New Global Reporting Format for Runway Surface Condition (GRF 2019)
2nd Quarter 2019	Commencement of stakeholder engagement – CAD/HKALPA/HKO/AAHK/Local Based Airlines
2nd Quarter 2019 to late 2021	Trial of MD30, engagement of consultant regarding water retention study, discuss with various parties via AOSC, RST, and presentation in AOP/SG/5 (Jun 2021)
1st to 2nd Quarter 2020	AAHK's staff enrolled in ICAO-ACI GRF on-line Course
April 2021	Regulator incorporated Runway Condition Report as the Aerodrome Licensing Requirement
5 November 2021	Full Implementation

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Continuously Reporting to ICAO the progress of GRF Implementation

COSCAP North Asia — Cooperative Development of Operational Safety & Continuing Airworthiness Programme

NEW ICAO METHODOLOGY FOR ASSESSING AND REPORTING RUNWAY SURFACE CONDITIONS (GRF)

IMPLEMENTATION ACTION PLAN [v0.3]

HONG KONG, CHINA

ID	ACTION	ENTITY RESPONSIBLE	TARGET DATE[1]	REMARKS
GRF 1	Review ICAO provisions and guidance and other Organisations guidance (see below)	HKCAD	15/04/2020	ICAO provisions and guidance reviewed. Assessment for further enhancements will be conducted continuously.
GRF 2	Designate a focal point to coordinate implementation activities at the state level	HKCAD	15/04/2020	The Airport Subsections of APSD were designated as the focal point of GRF implementation
GRF 3	Identify concerned focal points in each entity (CAA, Airport, ANSP, Aircraft operators – include BA, GA and military as applicable)	APSD (HKCAD), ATMD (HKCAD), HKO and AA in liaison with aircraft operators	15/04/2020	
GRF 4	Establish a coordination meeting / committee attended by relevant stakeholder in the implementation of GRF	HKCAD	30/04/2020	

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International Civil Aviation Organization | Organisation de l'aviation civile internationale | Organización de Aviación Civil Internacional | Международная организация гражданской авиации | منظمة الطيران المدني الدولي | 国际民用航空组织

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Ref.: AN 10/1.1, AN 11/1.3.33, AN 11/6.3.32, AN 3/5.13, AN 4/1.2.29, AN 2/2.7, AN 13/2.1, AN 4/27 and AN 2/33-20/73

30 July 2020

Subject: Changes to applicability dates of SARPs and PANS related to the enhanced global reporting format for assessing and reporting runway surface conditions (GRF) due to the COVID-19 pandemic.
Adoption of Amendments: 80 to Annex 3; 45 to Annex 6, Part I; 38 to Annex 6, Part II; 107 to Annex 8; 16 to Annex 14, Volume I; and 42 to Annex 15, and approval of Amendments: 10 to PANS-ATM; 4 to PANS-Aerodromes; and 2 to PANS-AIM:

Action required:
Annexes: a) Notify any disapproval before 30 September 2020;
b) Notify any differences and compliance before 4 October 2021;
c) Consider the use of the Electronic Filing of Differences (EFOD) System for notification of differences and compliance
PANS: a) Implementation of the amendment on 4 November 2021;
b) Publication of any differences as of 4 November 2021

Sir/Madam,

1. The Council, at the fourth meeting of its 219th Session held on 9 March 2020, when adopting the declaration related to the outbreak of the novel coronavirus (COVID-19), reaffirmed its commitment to closely monitor the situation and support Member States in their response measures, as appropriate, and its readiness to take further action as circumstances develop.

2. I have the honour to inform you that the Council, at the eighth meeting of its 220th Session held on 19 June 2020, reviewed a number of previously adopted amendments to Standards and Recommended Practices (SARPs) contained in several Annexes to the Convention on International Civil Aviation requiring Member States to take the necessary implementation actions (regulatory, training, etc.) before their applicability date of 5 November 2020. These actions will have to be undertaken by Member States, and other aviation industry stakeholders, while dealing with the COVID-19 crisis, the resultant contingency measures, or the aftermath of the crisis and the normalization phase.

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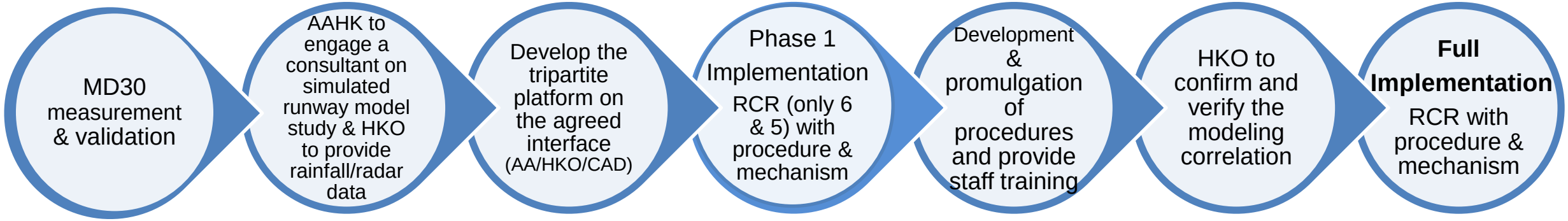
GRF Implementation Journey

COMPLETED

Implementation date delayed for 1 year due to COVID-19 pandemic



Q2 2020 – Q3 2021	Q3 2020	Q1 2021	Q3 2021	Q3 2021	Q3 2021	4 Nov 2021

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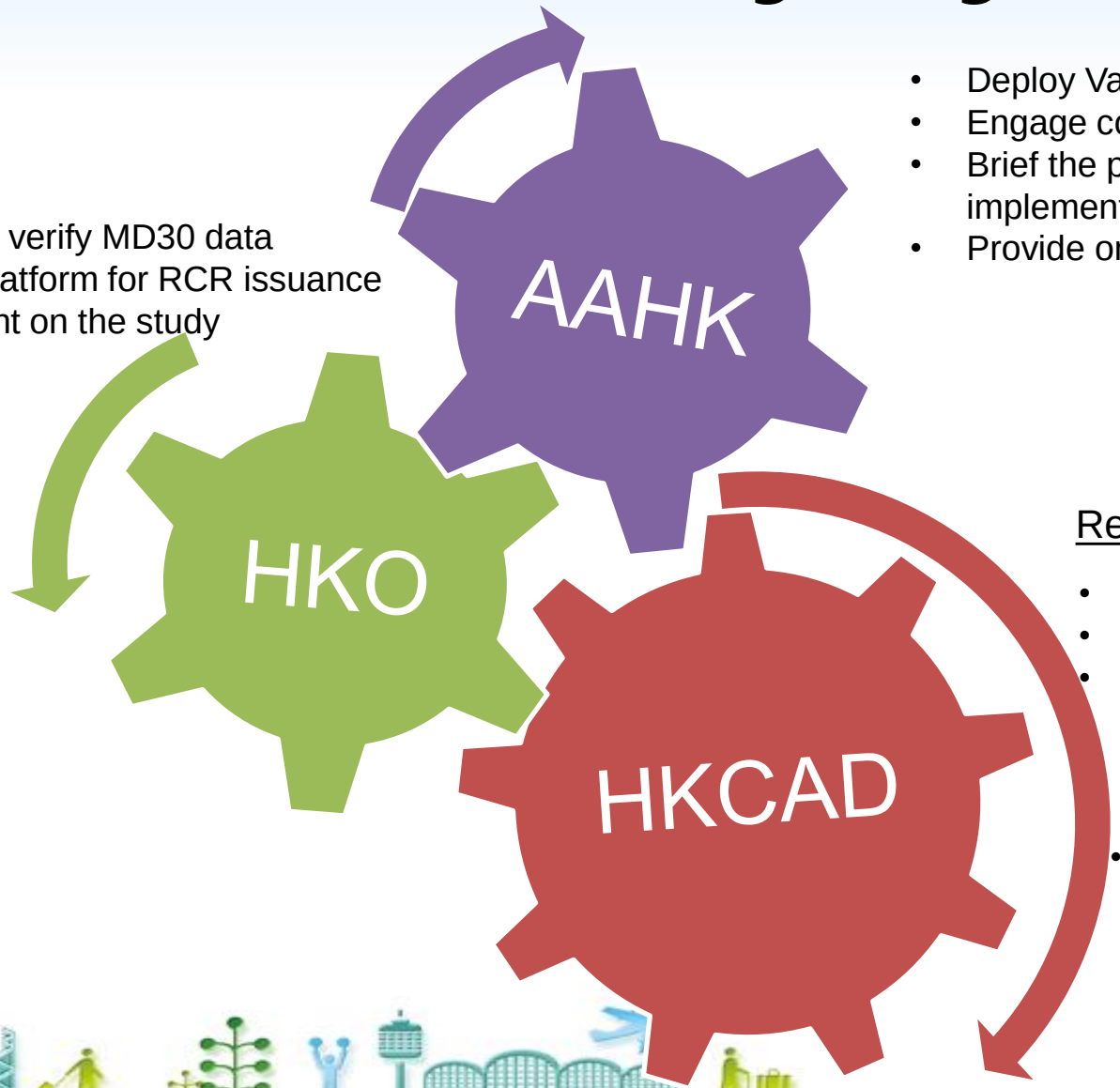
Working Concertedly with Hong Kong Civil Aviation Department (HKCAD) & Hong Kong Observatory (HKO)

- Provide rainfall data for verify MD30 data
- Develop the tripartite platform for RCR issuance
- Work with the consultant on the study



- Deploy Vaisala MD30 for water measurement
- Engage consultant on simulated runway model study
- Brief the pilots & airport community about GRF implementation in HKIA
- Provide on-the-job training to operation staff

<u>Regulatory Arm (Airport Standards Division)</u>

- Review ICAO provisions and guidance on GRF
- Monitor implementation activities
- set the requirements on GRF

<u>Air Navigation Service Provider (Air Traffic Management Division)</u>

- Upon receiving changes on RCR from AAHK, notify pilots via various means including NOTAM / ATIS / VHF comms etc.

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Runway Condition Assessment Matrix

- Airport operators will base on the Assessment Matrix to report runway surface condition when water or contaminants are present
- Due to geographic location, HKIA never experience or report in snow and icy conditions
- Only RWYCC 6, 5, 3 and 2 will be generated for HKIA unless downgraded with pilot reports of runway braking action

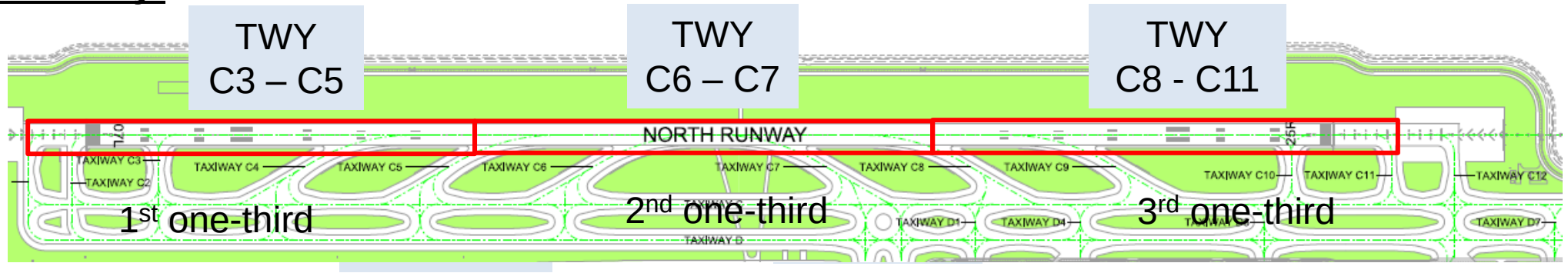
RCAM — WET and DRY only (based on PANS-Aerodromes (Doc 9981))

RUNWAY CONDITION ASSESSMENT MATRIX (RCAM)			
Assessment criteria		Downgrade assessment criteria	
Runway condition code *(RWYCC)*	Runway surface description	Aeroplane deceleration or directional control observation	Pilot report of runway braking action
6	• DRY	---	---
5	• WET (The runway surface is covered by any visible dampness or water up to and including 3 mm depth)	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	GOOD
4		Braking deceleration OR directional control is between Good and Medium.	GOOD TO MEDIUM
3	• WET ("slippery wet" runway)	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	MEDIUM
2	***More than 3 mm depth of water:*** • STANDING WATER	Braking deceleration OR directional control is between Medium and Poor.	MEDIUM TO POOR
1		Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	POOR
0		Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	LESS THAN POOR

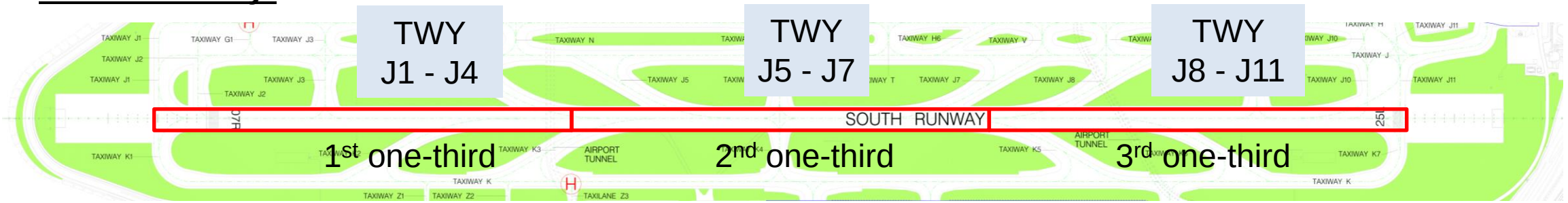
Note. — An RWYCC 5,4,3 or 2 cannot be upgraded.

HKIA Runway Section Details

North Runway:



South Runway:



Procurement and Setup of Vaisala MD30

- Purchase Vaisala MD30 and deploy for water measurement since 18 May 20
- Engage a vendor to add latitude/longitude information and RCR generating function

Install the MD30 at the front of the vehicle
Calibrate MD30 with reference plate

Measurement Area:

- ✓ Between two runway extremities
- ✓ +/- 5 meters away from the centerline
- ✓ Conduct on both North and South Runway
- ✓ Driving speed: 60km/hr

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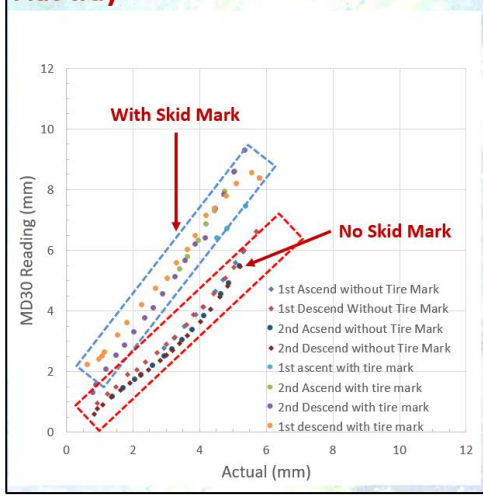
MD30 Runway Measurement

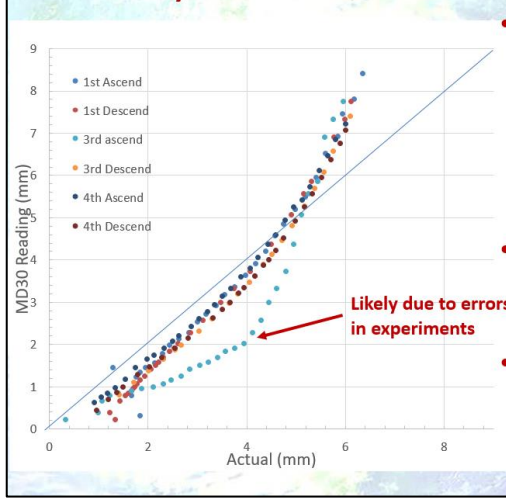
- Conduct water depth measurement since May 2020
- Continuous enhancement with measured water depth data since Nov 2021

Flat tray



- Around 0.2mm of error for properly surfaced flat tray
- Reading scaled by a factor of 1.5-2 for tray surfaced with skid mark

Grooved tray



- Water depth with reference to the top surface (not the bottom of the groove)
- Change in bias at depth of 5mm
- Impact relatively less compared with the skid mark

ON-GOING

Generate report in RCR format:

RCR_Runway_North_2020-09-22_104004_ - Notepad

File Edit Format View Help

```
RCR     VHHH    09220240        07      5/5/5   100/100/100     NR/NR/NR
WET/WET/WET
100% of 1st runway third is covered by <=3mm water and 0% of 1st runway third is covered by >3mm water.
100% of 2nd runway third is covered by <=3mm water and 0% of 2nd runway third is covered by >3mm water.
100% of 3rd runway third is covered by <=3mm water (2% of DRY) and 0% of 3rd runway third is covered by >3mm water.
```

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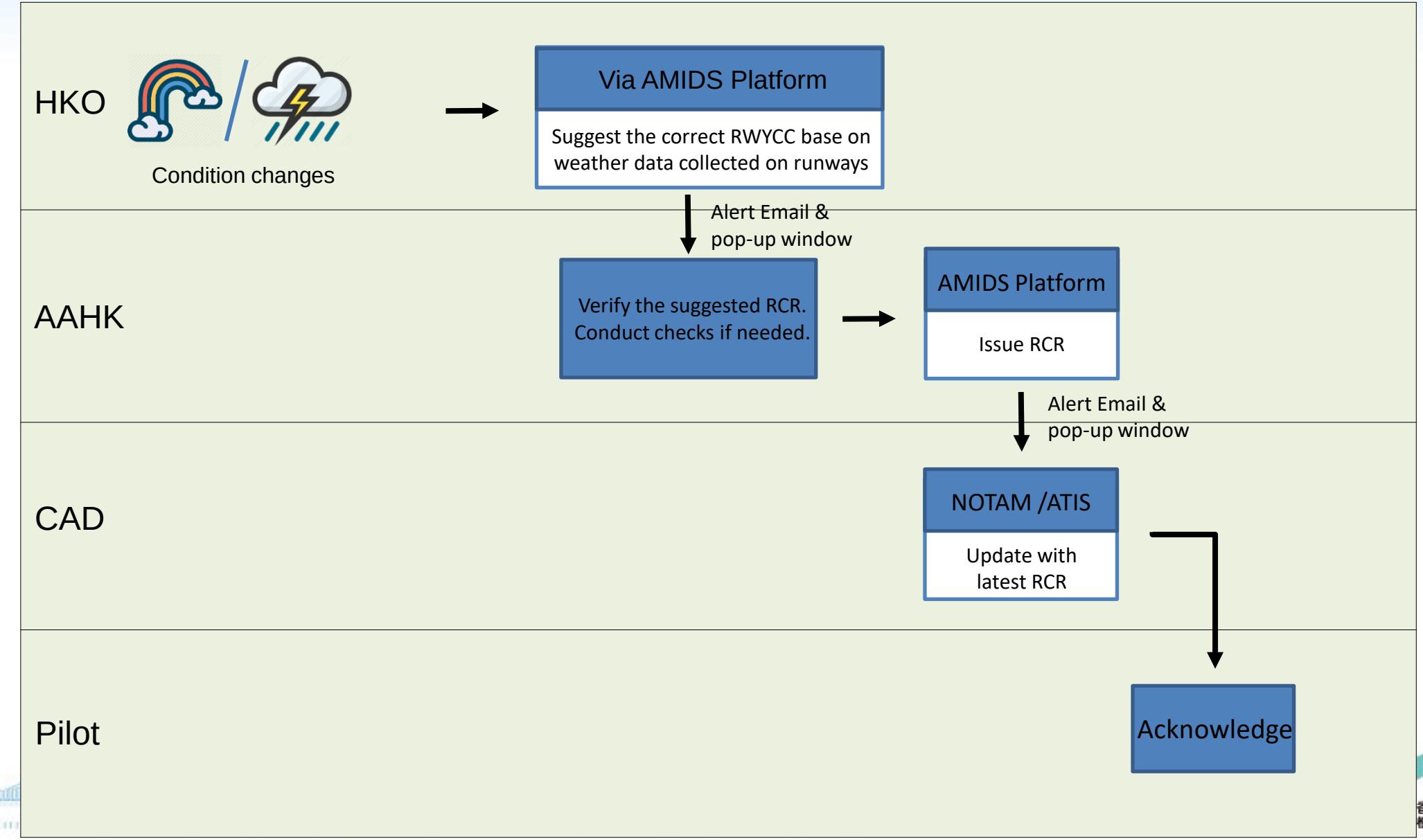
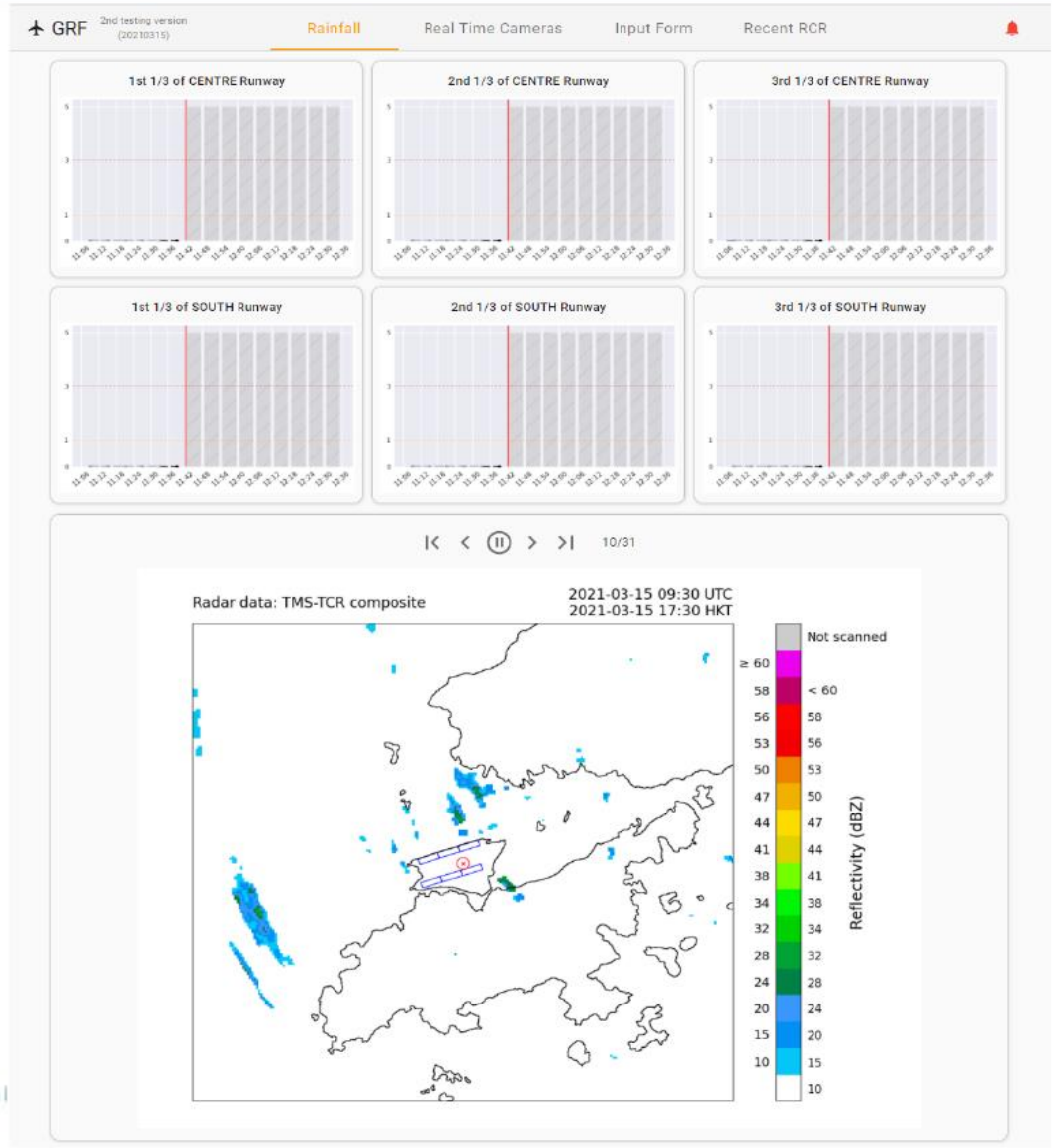
Workflow for RCR Issuance



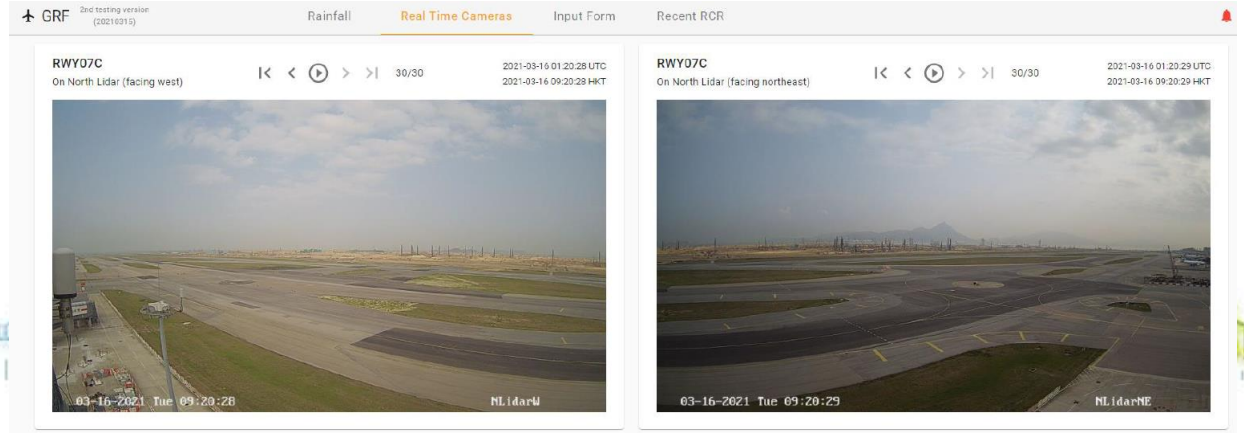
Tripartite Platform between HKO/AA/CAD

1) Tripartite Platform via AMIDS

2) Rainfall from HKO Radar Data & LT 31



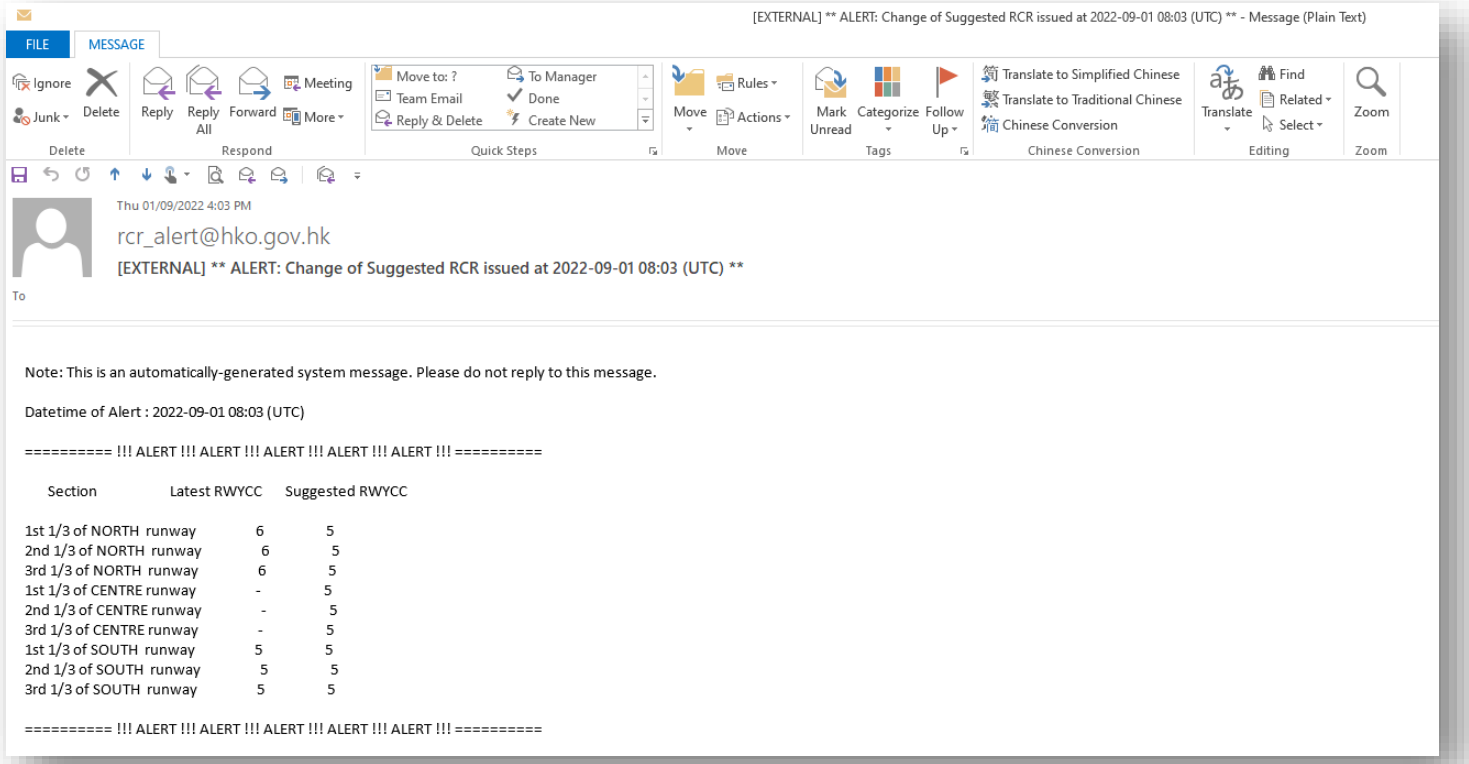
3) Runways Real time monitoring



System Alert When Rains

If it rains at the Runways, alert emails will be received from HKO

1) Alert by emails to change RCR



[EXTERNAL] ** ALERT: Change of Suggested RCR issued at 2022-09-01 08:03 (UTC) ** - Message (Plain Text)

FILE | MESSAGE

Ignore | Junk | Delete | Reply | Reply All | Forward | Meeting | More | Move to: ? | Team Email | Reply & Delete | To Manager | Done | Create New | Move | Rules | Actions | Mark Unread | Categorize | Follow Up | Translate to Simplified Chinese | Translate to Traditional Chinese | Chinese Conversion | Translate | Find | Related | Select | Zoom

Delete | Respond | Quick Steps | Move | Tags | Chinese Conversion | Editing | Zoom

Thu 01/09/2022 4:03 PM

rcr_alert@hko.gov.hk

[EXTERNAL] ** ALERT: Change of Suggested RCR issued at 2022-09-01 08:03 (UTC) **

To

Note: This is an automatically-generated system message. Please do not reply to this message.

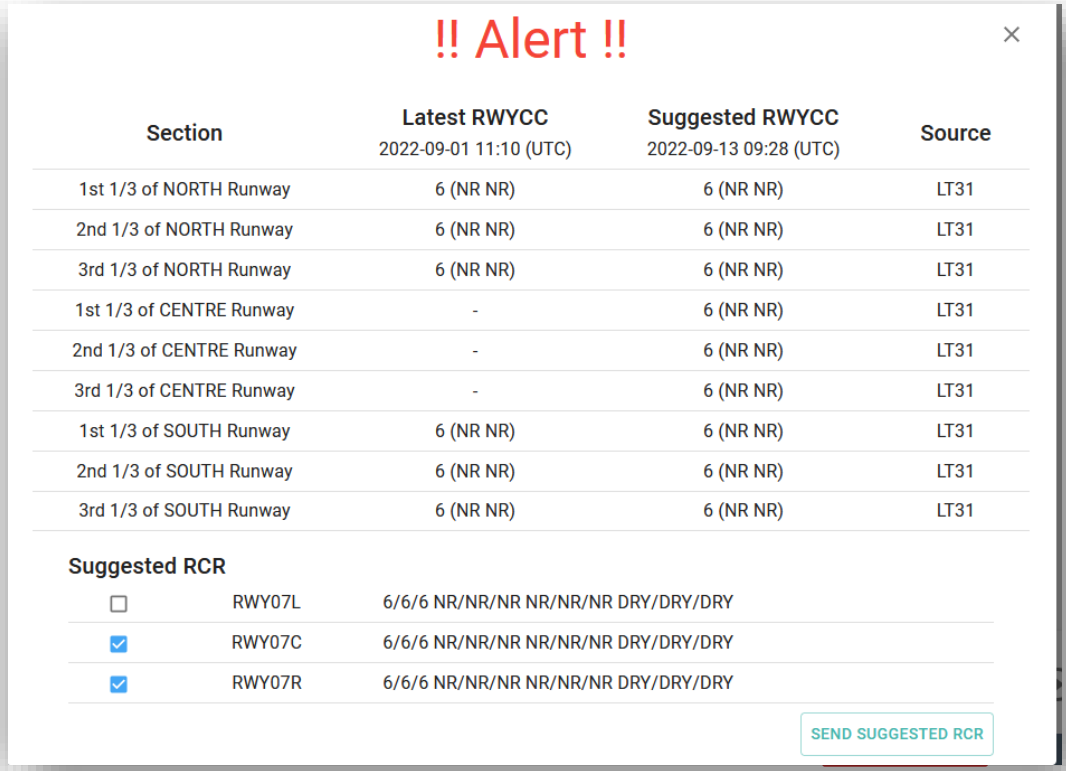
Datetime of Alert : 2022-09-01 08:03 (UTC)

========== !!! ALERT !!! ALERT !!! ALERT !!! ALERT !!! ALERT !!! ==========

Section	Latest RWYCC	Suggested RWYCC
1st 1/3 of NORTH runway	6	5
2nd 1/3 of NORTH runway	6	5
3rd 1/3 of NORTH runway	6	5
1st 1/3 of CENTRE runway	-	5
2nd 1/3 of CENTRE runway	-	5
3rd 1/3 of CENTRE runway	-	5
1st 1/3 of SOUTH runway	5	5
2nd 1/3 of SOUTH runway	5	5
3rd 1/3 of SOUTH runway	5	5

========== !!! ALERT !!! ALERT !!! ALERT !!! ALERT !!! ALERT !!! ==========

2) Alert by System to change RCR



!! Alert !!

Section	Latest RWYCC 2022-09-01 11:10 (UTC)	Suggested RWYCC 2022-09-13 09:28 (UTC)	Source
1st 1/3 of NORTH Runway	6 (NR NR)	6 (NR NR)	LT31
2nd 1/3 of NORTH Runway	6 (NR NR)	6 (NR NR)	LT31
3rd 1/3 of NORTH Runway	6 (NR NR)	6 (NR NR)	LT31
1st 1/3 of CENTRE Runway	-	6 (NR NR)	LT31
2nd 1/3 of CENTRE Runway	-	6 (NR NR)	LT31
3rd 1/3 of CENTRE Runway	-	6 (NR NR)	LT31
1st 1/3 of SOUTH Runway	6 (NR NR)	6 (NR NR)	LT31
2nd 1/3 of SOUTH Runway	6 (NR NR)	6 (NR NR)	LT31
3rd 1/3 of SOUTH Runway	6 (NR NR)	6 (NR NR)	LT31

Suggested RCR

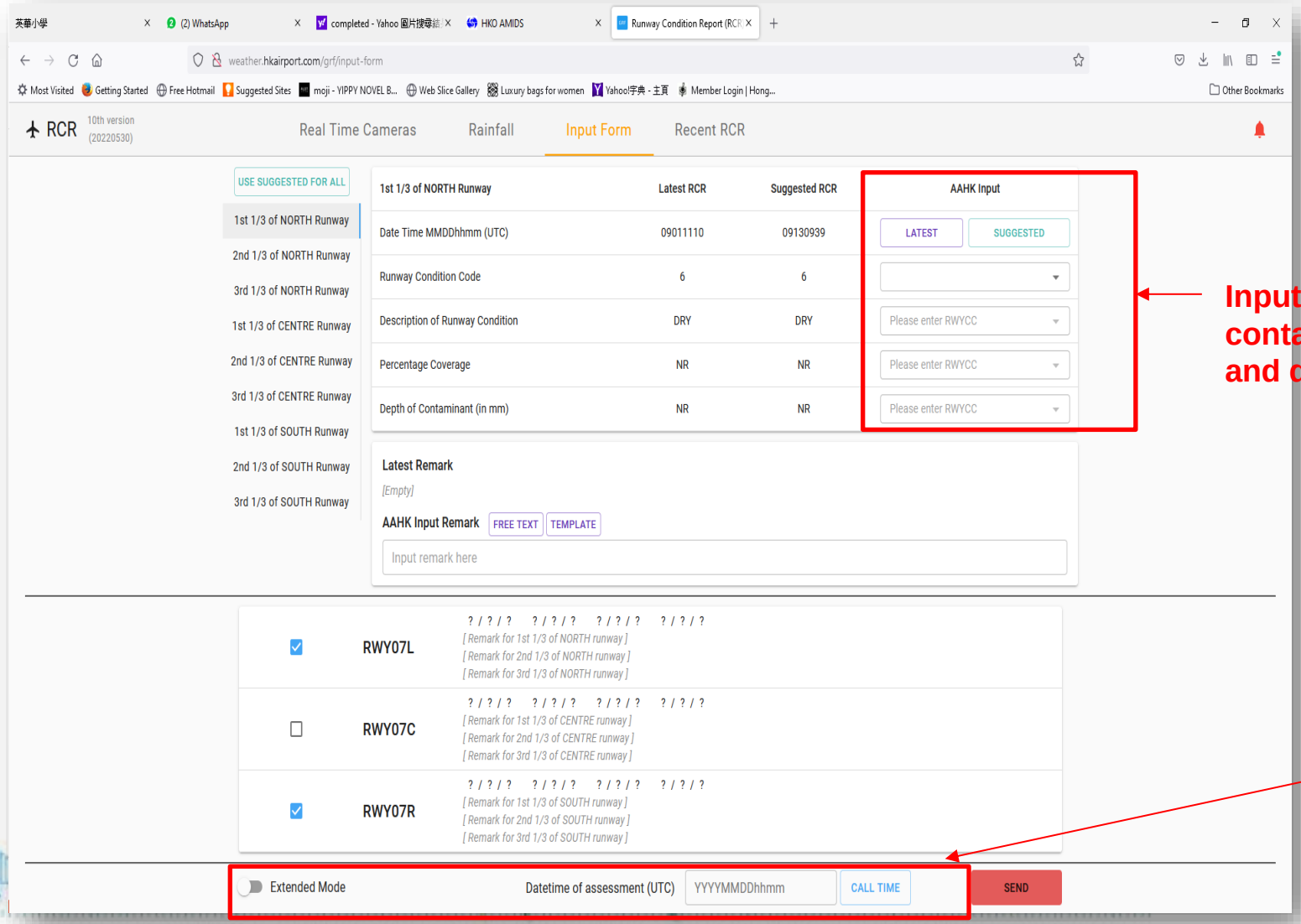
☐	RWY07L	6/6/6 NR/NR/NR NR/NR/NR DRY/DRY/DRY
☑	RWY07C	6/6/6 NR/NR/NR NR/NR/NR DRY/DRY/DRY
☑	RWY07R	6/6/6 NR/NR/NR NR/NR/NR DRY/DRY/DRY

SEND SUGGESTED RCR

*Note: Centre Runway is closed for reconfiguration

AA to Issue RCR

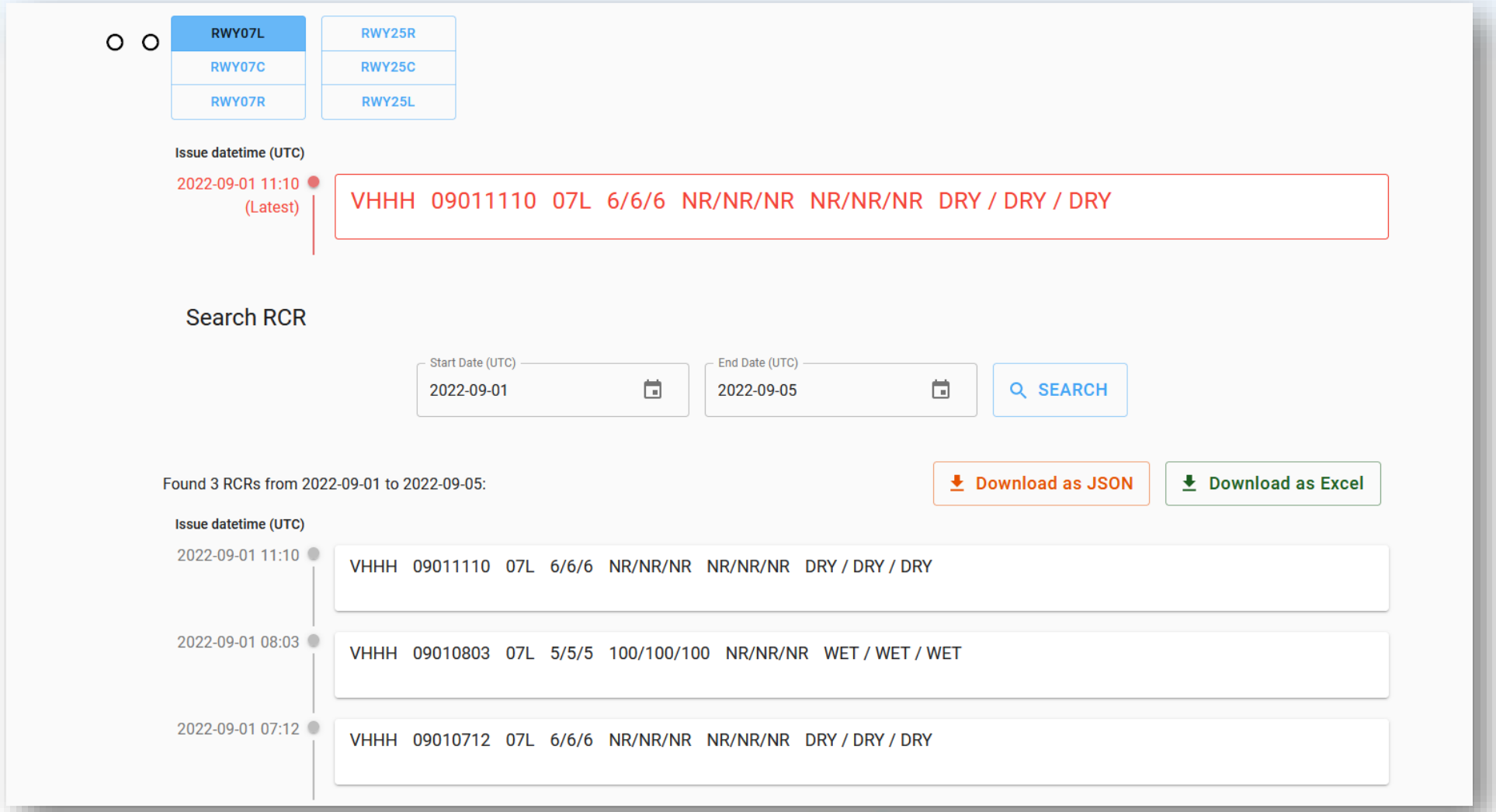
- RCR input format:



Input RWYCC, type of contaminant, coverage % and depth for each one-third

Enter assessment time and send to CAD

CAD Received the issued RCR



→ ATC onward update pilots via Notam/ATIS

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Pilots & Airlines Engagement

- Well engaged Hong Kong Airline Pilots Association (HKALPA) and Local airlines via different forums, i.e. AOC, RST, AOSC meetings
- Agreed on braking action report to ATC

ATC /CAD

Receives 4 consecutive braking action reports of "GOOD to MEDIUM", "MEDIUM" or "MEDIUM to POOR"

3 consecutive "GOOD" pilot braking action reports

Phone call

AA

- Update RCR via AMIDS

Conclusion

- Hong Kong Observatory has offered enormous support in GRF implementation
- HKCAD has offered unfailing support and guidance to AAHK during the course of GRF development
- AAHK pledge to ensure reporting the accurate runway condition to the airmen and working closely with stakeholders including but not limited to HKALPA and HKCAD to refine the GRF process in a continuous manner
- HKALPA and local airlines pilots offered tremendous support to AAHK in the course of GRF development

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Thank You

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