

# Global Reporting Format (GRF) at HKIA

*June 2021*



# Joined the ICAO Events on GRF

- AAHK joined the following ICAO events:-
  - New ICAO Methodology for Assessing and Reporting Runway Surface Conditions on 26 May 2020;
  - APAC Regional Seminar on GRF on 24-28 Jun 2019
  - ICAO/ACI Symposium on Implementation of the New Global Reporting Format for Runway Surface Condition on 26-28 Mar 2019
- GRF Implementation Plan was presented by EASA and major actions include the following:-
  - Education
  - Promotion
  - Training
  - Testing
  - AIP



# ICAO Training

- More than 40 AAHK staff have completed ACI/ICAO Global Reporting Format online course in 2020

## Course Content

ACI AIRPORTS COUNCIL INTERNATIONAL

ACI/ICAO Global Reporting Format Home

home resources glossary exit

- ✓ > Section 1 - Welcome
- ✓ > Section 2 - Overview
- ✓ > Section 3 - Background to the ICAO Global Reporting Format (GRF)
- ✓ > Section 4 - Runway Condition Assessment Matrix (RCAM)
- ✓ > Section 5 - Adjusted Runway Condition Codes
- ✓ > Section 6 - When to Conduct a Runway Condition Assessment
- ✓ > Section 7 - Conducting a Runway Condition Assessment
- ✓ > Section 8 - Runway Condition Worksheet
- ✓ > Section 9 - Example Scenarios
- ✓ > Assessment

ceventas

Course completed ✓

## Certificate

ACI AIRPORTS COUNCIL INTERNATIONAL

This is to certify that

has successfully completed the following course:

ACI-ICAO Global Reporting Format

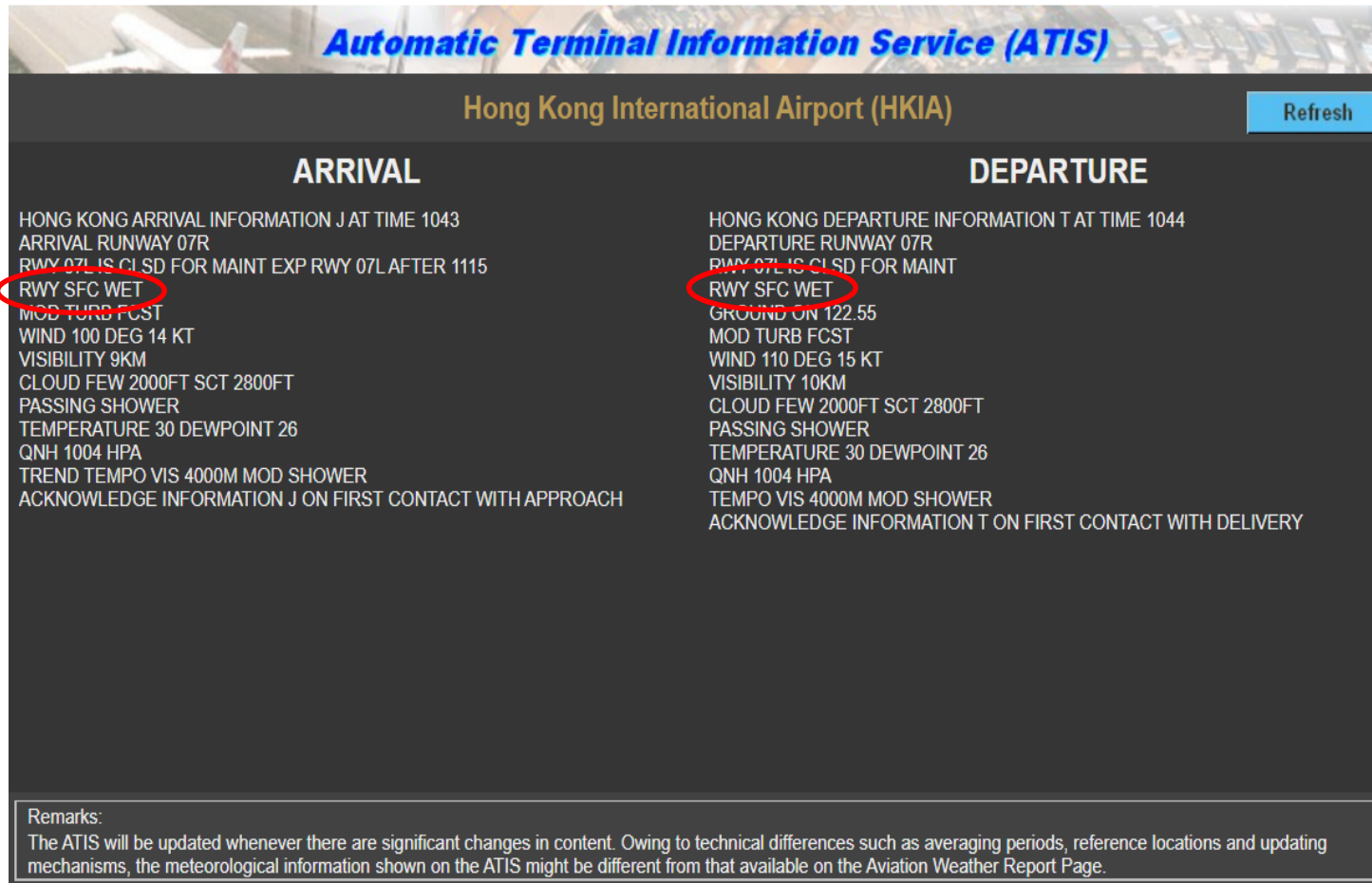
*Kevin Caron*  
Kevin Caron - Director, Capacity Building Programmes

20/04/2020  
Date of Issue

42949038  
Certificate Number

# Existing Measure of HKIA

- Report “WET” or “DAMP” via ATIS to describe runway surface condition



**Automatic Terminal Information Service (ATIS)**

Hong Kong International Airport (HKIA) Refresh

ARRIVAL	DEPARTURE
HONG KONG ARRIVAL INFORMATION J AT TIME 1043	HONG KONG DEPARTURE INFORMATION T AT TIME 1044
ARRIVAL RUNWAY 07R	DEPARTURE RUNWAY 07R
RWY 07L IS CLSD FOR MAINT EXP RWY 07L AFTER 1115	RWY 07L IS CLSD FOR MAINT
<b>RWY SFC WET</b>	<b>RWY SFC WET</b>
MOD TURB FCST	GROUND ON 122.55
WIND 100 DEG 14 KT	MOD TURB FCST
VISIBILITY 9KM	WIND 110 DEG 15 KT
CLOUD FEW 2000FT SCT 2800FT	VISIBILITY 10KM
PASSING SHOWER	CLOUD FEW 2000FT SCT 2800FT
TEMPERATURE 30 DEWPOINT 26	PASSING SHOWER
QNH 1004 HPA	TEMPERATURE 30 DEWPOINT 26
TREND TEMPO VIS 4000M MOD SHOWER	QNH 1004 HPA
ACKNOWLEDGE INFORMATION J ON FIRST CONTACT WITH APPROACH	TEMPO VIS 4000M MOD SHOWER
	ACKNOWLEDGE INFORMATION T ON FIRST CONTACT WITH DELIVERY

Remarks:  
The ATIS will be updated whenever there are significant changes in content. Owing to technical differences such as averaging periods, reference locations and updating mechanisms, the meteorological information shown on the ATIS might be different from that available on the Aviation Weather Report Page.



# New Measures: 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 in the initial assessment

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	<b>More than 3 mm depth of water:</b> • 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

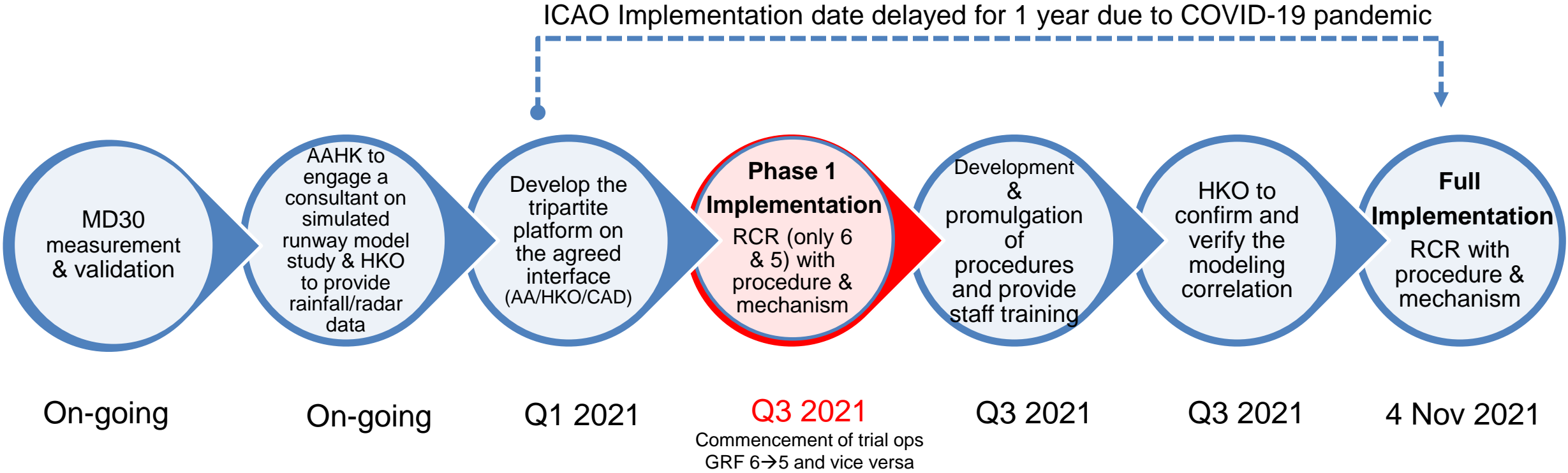
Simplified version of RCAM for airport that never experience snow/icy conditions

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

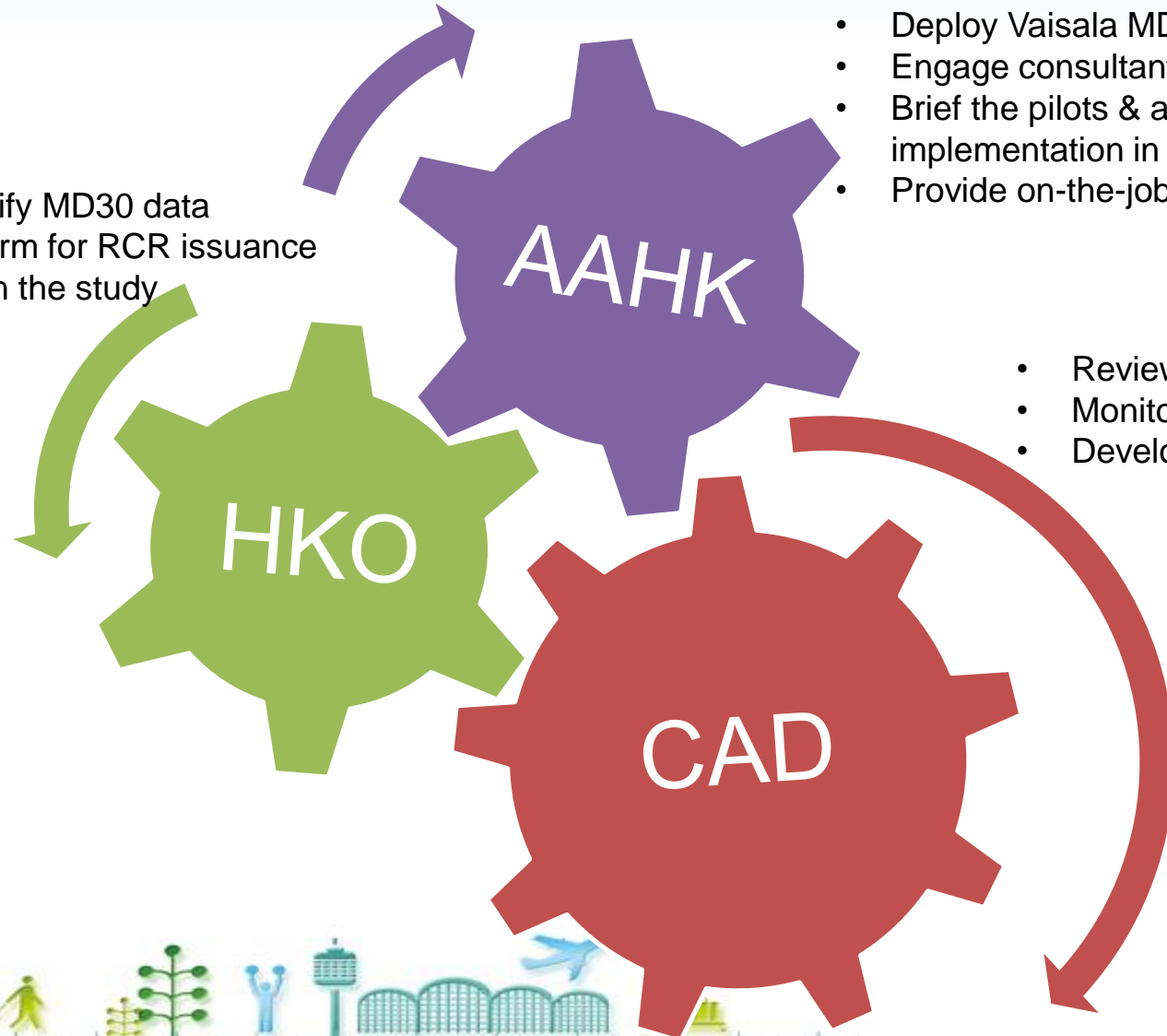




# GRF Implementation Timeline



# Working Concertedly with Civil Aviation Department (CAD) & 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

- Review ICAO provisions and guidance on GRF
- Monitor implementation activities
- Develop and promulgate regulations and standard



# 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:

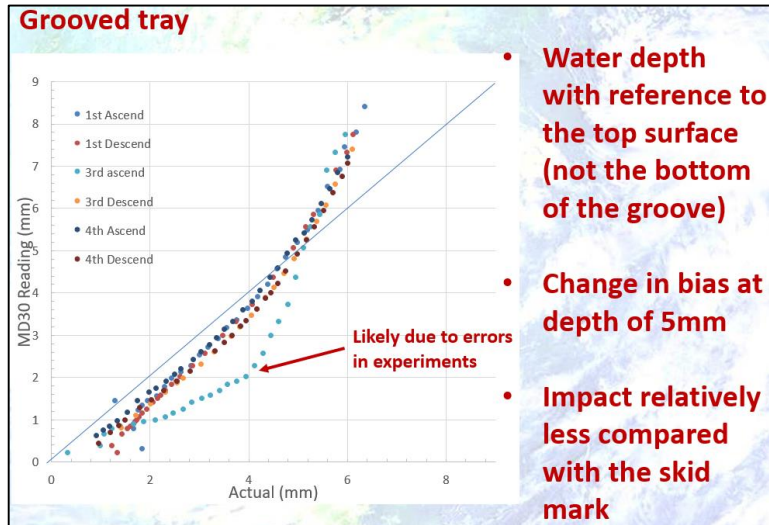
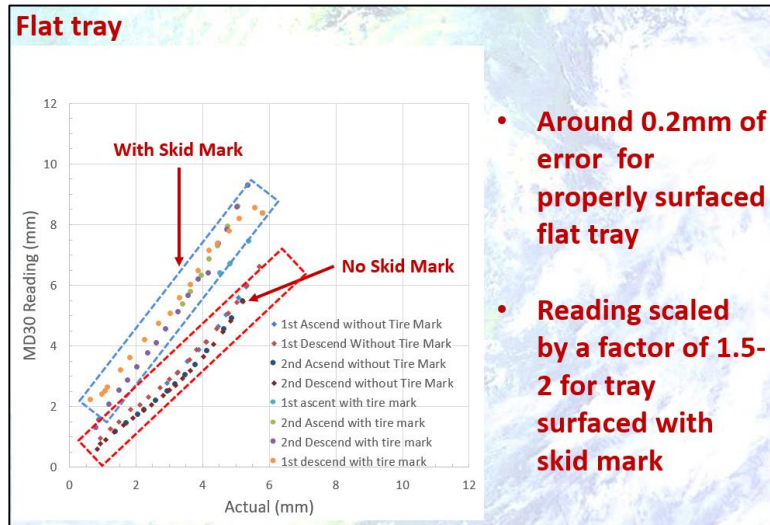


- ✓ Between two runway extremities
- ✓ +/- 5 meters away from the centerline
- ✓ Conduct on both North and South Runway
- ✓ Driving speed: 60km/hr

# MD30 Runway Measurement



- Conduct over 40 runs since May 2020
- HKO verified the measurement data with rainfall radar data and confirmed its accuracy



## Generate report in RCR format:

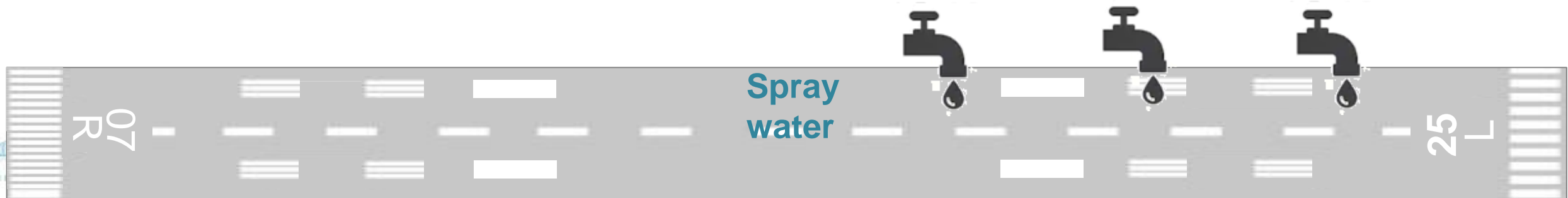
```

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.
    
```



# Consultancy Modelling for Rain Intensity Correlation

- HKIA ranked as one of the busiest airports, request time slot to access active runway for conducting water measurement is not always possible
- Engage consultant to perform a series of laboratory experiments using water sprays and modelled runway sections to simulate possible water depth in different raining scenarios
- The experimental results would be combined with radar data and rain gauge collected by HKO for estimating the water depths on the runway
- Further measurement using MD30 would be performed to calibrate this method



# Workflow for RCR Issuance



## Upon Rainfall

RCC from 6 → 5 with 100% coverage and NR water level

**HKO - AMIDS**  
Alert AAHK and generate suggested RCR based on rainfall / rain gauge data



**AAHK**  
Review the RCR by checking AFODDS / CCTV, conduct visual check if needed and issue the final RCR to CAD via AMIDS



**CAD**  
Adjust the RCR if necessary and convey RCR info to aircraft operator via ATIS/NOTAM



**Pilot**  
Determine the safety measure for take-off or landing



## Upon Cessation of Rainfall

RCC from 5 → 6 which ≤10% runway is wet

**HKO - AMIDS**  
Alert AAHK and generate suggested RCR based on rainfall / rain gauge data



**AAHK**  
After 30 minutes received NR for all 1/3: AAHK will check AFODDS / CCTV, conduct visual check, conduct runway inspection if needed and issue the RCR to CAD via AMIDS



**CAD**  
Adjust the RCR if necessary and convey RCR info to aircraft operator via ATIS/NOTAM



**Pilot**  
Determine the safety measure for take-off or landing



# Reporting Mechanism (AMIDS)

## 1) Tripartite Platform via AMIDS

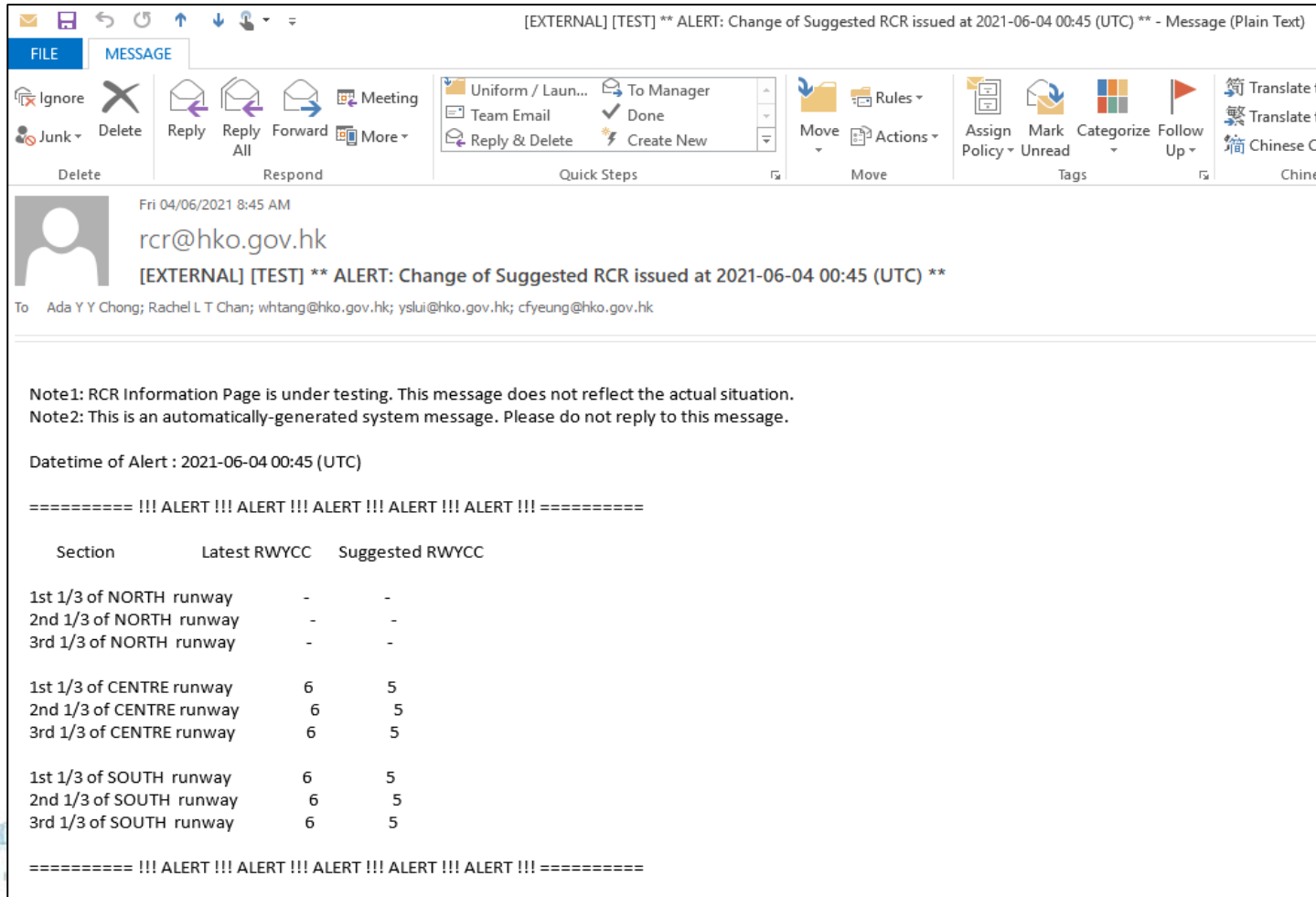
## 3) North Runway Real time monitoring

## 2) Rainfall from HKO Radar Data & Rain Gauge

# System Alert by AMIDS

If it rains at the Runways, ACC (Apron Control Center) will receive the alerts from HKO

## 1) Alert by emails to change RCR



[EXTERNAL] [TEST] \*\* ALERT: Change of Suggested RCR issued at 2021-06-04 00:45 (UTC) \*\* - Message (Plain Text)

FILE MESSAGE

Ignore Delete Reply Reply Forward Meeting More

Uniform / Laun... To Manager

Team Email Done

Reply & Delete Create New

Move Rules

Assign Mark Categorize Follow

Policy Unread Tags Up

Translate t Translate t

Chinese C

Chine

Fri 04/06/2021 8:45 AM

rcr@hko.gov.hk

[EXTERNAL] [TEST] \*\* ALERT: Change of Suggested RCR issued at 2021-06-04 00:45 (UTC) \*\*

To Ada Y Y Chong; Rachel L T Chan; whtang@hko.gov.hk; yslui@hko.gov.hk; cfyeeung@hko.gov.hk

Note1: RCR Information Page is under testing. This message does not reflect the actual situation.  
Note2: This is an automatically-generated system message. Please do not reply to this message.

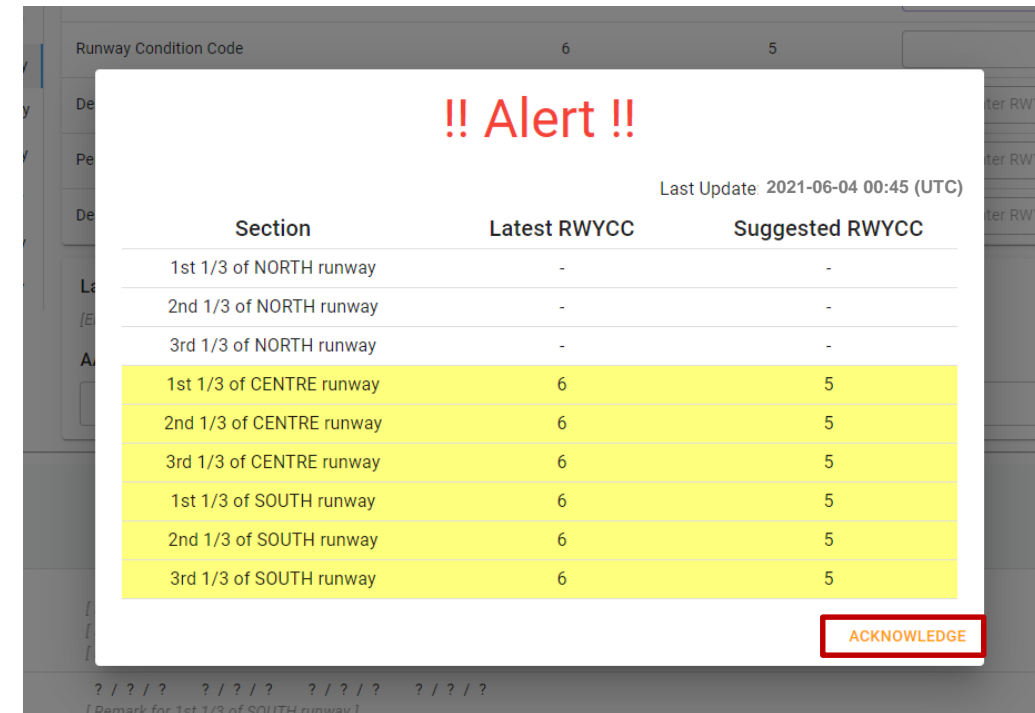
Datetime of Alert : 2021-06-04 00:45 (UTC)

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

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

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

## 2) Alert by System to change RCR



Runway Condition Code

6 5

!! Alert !!

Last Update: 2021-06-04 00:45 (UTC)

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

ACKNOWLEDGE

??/? ?/?/? ?/?/? ?/?/?

[Remark for 1st 1/3 of SOUTH runway]

\*Note: Centre Runway = existing North Runway

# Tripartite Platform

- RCR input format:

✈ GRF 3rd testing version (20210602)

Rainfall Real Time Cameras **Input Form** Recent RCR

	1st 1/3 of CENTRE runway	Latest RCR	Suggested RCR	AAHK Input
1st 1/3 of NORTH runway				
2nd 1/3 of NORTH runway				
3rd 1/3 of NORTH runway				
1st 1/3 of CENTRE runway				<input type="button" value="LATEST"/> <input type="button" value="SUGGESTED"/>
2nd 1/3 of CENTRE runway				<input type="text" value="Please enter RWYCC"/>
3rd 1/3 of CENTRE runway				<input type="text" value="Please enter RWYCC"/>
1st 1/3 of SOUTH runway				<input type="text" value="Please enter RWYCC"/>
2nd 1/3 of SOUTH runway				<input type="text" value="Please enter RWYCC"/>
3rd 1/3 of SOUTH runway				<input type="text" value="Please enter RWYCC"/>

Date Time MMDDhhmm (UTC) 06040258 06070121

Runway Condition Code 6 6

Description of Contaminant DRY DRY

Percentage Coverage NR NR

Depth of Contaminant (In mm) NR NR

Latest Remark [Empty]

AAHK Input Remark

Input remark here

---

RWY07L	NOT AVAILABLE
RWY07C	? / ? / ? ? / ? / ? ? / ? / ? ? / ? / ? ? [ Remark for 1st 1/3 of CENTRE runway ] [ Remark for 2nd 1/3 of CENTRE runway ] [ Remark for 3rd 1/3 of CENTRE runway ]
RWY07R	? / ? / ? ? / ? / ? ? / ? / ? ? / ? / ? ? [ Remark for 1st 1/3 of SOUTH runway ] [ Remark for 2nd 1/3 of SOUTH runway ] [ Remark for 3rd 1/3 of SOUTH runway ]

Extended Mode

Datetime of assessment (UTC)

Choose each one-third of Centre\*/South Runway

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

Enter assessment time and send to CAD

\*Note: Centre Runway = existing North Runway



# RCR Received by Air Traffic Control (ATC)

## Successful joint system test (AA, ATC & HKO) on 21 April 21

From: rcr@hko.gov.hk  
To:  
Date: 05/13/2021 05:37 PM  
Subject: [TEST] Runway Condition Report issued at 2021-05-13 09:36 (UTC)

Note1: RCR Information Page is under testing. This message does not reflect the actual situation.  
Note2: This is an automatically-generated system message. Please do not reply to this message.

Datetime of issuance : 2021-05-13 09:36 (UTC)  
Datetime of assessment : 2021-05-13 09:36 (UTC)

=====

RWY07L  
NOT AVAILABLE

RWY07C  
VHHH 05130936 07C 5/5/6 75/50/NR NR/NR/NR WET / WET / WET  
25% of 1st runway third is covered by <= 3mm water (0% of DRY) and 75% of 1st runway third is covered by > 3mm water.  
100% of 2nd runway third is covered by <= 3mm water (0% of DRY) and 0% of 2nd runway third is covered by > 3mm water.  
100% of 3rd runway third is covered by <= 3mm water (100% of DRY) and 0% of 3rd runway third is covered by > 3mm water.

RWY07R  
VHHH 05130936 07R 2/5/5 25/NR/NR 04/NR/NR STANDING WATER / WET / WET  
75% of 1st runway third is covered by <= 3mm water (0% of DRY) and 25% of 1st runway third is covered by > 3mm water.  
100% of 2nd runway third is covered by <= 3mm water (100% of DRY) and 0% of 2nd runway third is covered by > 3mm water.  
100% of 3rd runway third is covered by <= 3mm water (100% of DRY) and 0% of 3rd runway third is covered by > 3mm water.

=====

RWY25R  
NOT AVAILABLE

RWY25C  
VHHH 05130936 25C 6/5/5 NR/50/75 NR/NR/NR WET / WET / WET  
100% of 3rd runway third is covered by <= 3mm water (100% of DRY) and 0% of 3rd runway third is covered by > 3mm water.  
100% of 2nd runway third is covered by <= 3mm water (0% of DRY) and 0% of 2nd runway third is covered by > 3mm water.  
25% of 1st runway third is covered by <= 3mm water (0% of DRY) and 75% of 1st runway third is covered by > 3mm water.

RWY25L  
VHHH 05130936 25L 5/5/2 NR/NR/25 NR/NR/04 WET / WET / STANDING WATER  
100% of 3rd runway third is covered by <= 3mm water (100% of DRY) and 0% of 3rd runway third is covered by > 3mm water.  
100% of 2nd runway third is covered by <= 3mm water (100% of DRY) and 0% of 2nd runway third is covered by > 3mm water.  
75% of 1st runway third is covered by <= 3mm water (0% of DRY) and 25% of 1st runway third is covered by > 3mm water.

Rainfall Real Time Cameras

A new RCR has been submitted.

NOT AVAILABLE	NOT AVAILABLE
RWY07C	RWY25C
RWY07R	RWY25L

Issue datetime (UTC)

2021-05-13 09:36 (Latest)

VHHH 05130936 07C 5/5/6 75/50/NR NR/NR/NR WET / WET / WET  
25% of 1st runway third is covered by <= 3mm water (0% of DRY) and 75% of 1st runway third is covered by > 3mm water.  
100% of 2nd runway third is covered by <= 3mm water (0% of DRY) and 0% of 2nd runway third is covered by > 3mm water.  
100% of 3rd runway third is covered by <= 3mm water (100% of DRY) and 0% of 3rd runway third is covered by > 3mm water.

2021-05-13 09:31

VHHH 05130930 07C 5/5/6 75/50/NR NR/NR/NR WET / WET / WET  
25% of 1st runway third is covered by <= 3mm water (0% of DRY) and 75% of 1st runway third is covered by > 3mm water.  
100% of 2nd runway third is covered by <= 3mm water (0% of DRY) and 0% of 2nd runway third is covered by > 3mm water.  
100% of 3rd runway third is covered by <= 3mm water (100% of DRY) and 0% of 3rd runway third is covered by > 3mm water.

Search RCR

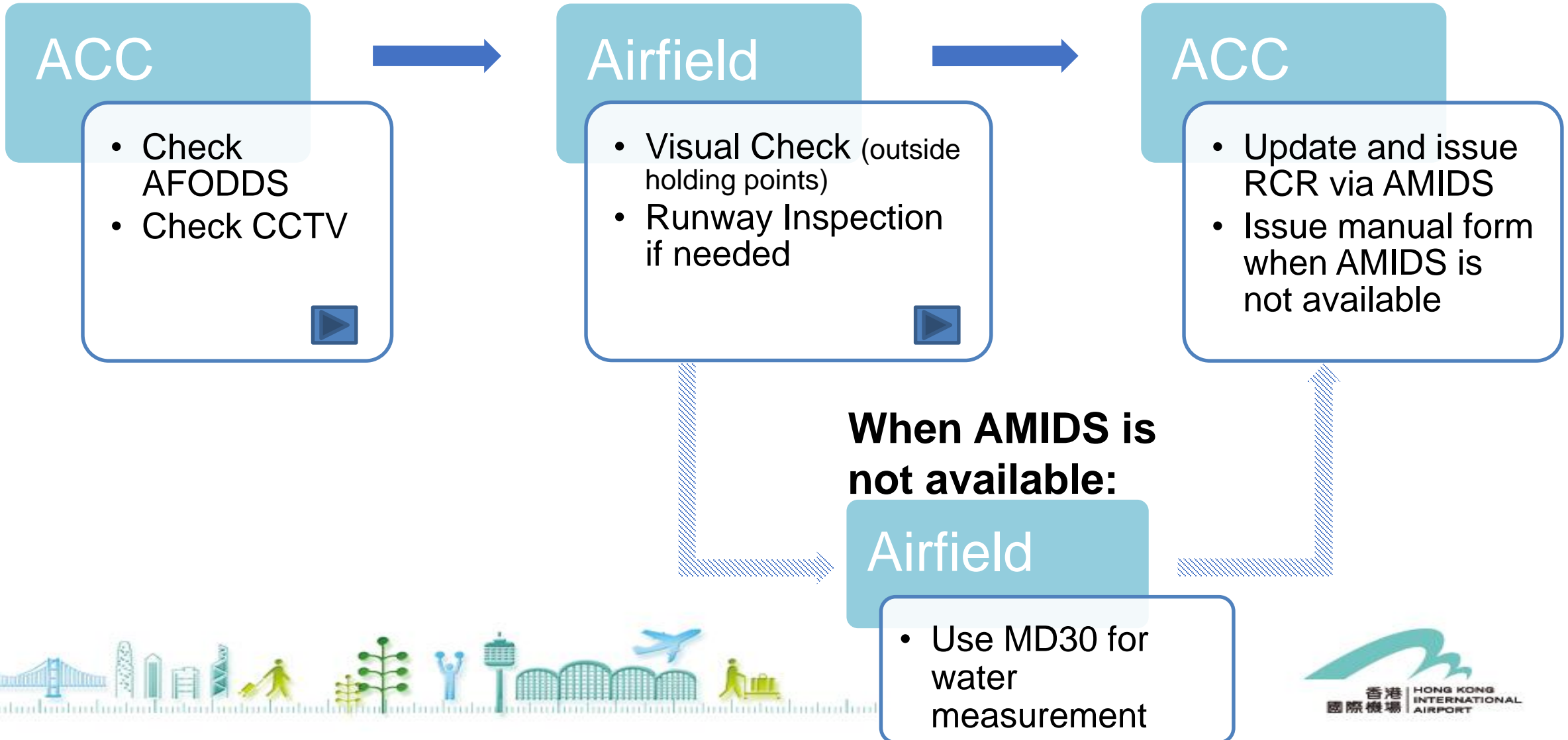
Start Date (UTC) End Date (UTC) SEARCH

**FULL RCR is only available when running MD30 measurement**



# Action to be Taken by AAHK

- How to confirm whether the runway is DRY?



# Community Consultation & Engagement

- Brief pilots since 18<sup>th</sup> Runway Safety Team (RST) meeting on 15 Oct 2020
- Feedback from pilots that they are accustomed to the format
- Will provide the GRF presentation to Pilots & Airfield Operations Committee (AOC)
  - Target completion date: July 2021

## Minute:

The workflow of issuing RCRs in HKIA was presented as below.

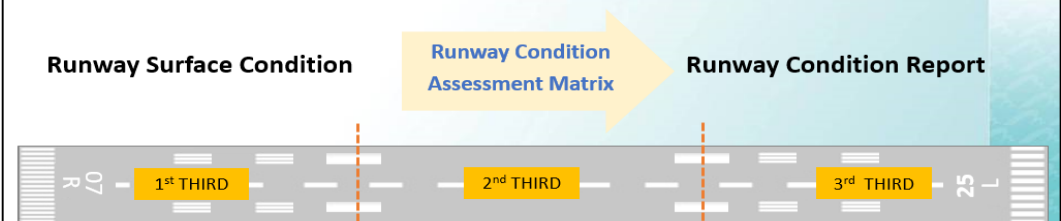


Mr. (HKALPA) further supplemented that the reports would be helpful for pilots in assessing aircraft performance and safety margin for each landing or take-off.

## Presentation Slides

### What is GRF?

- The new ICAO methodology for assessing and reporting runway surface conditions



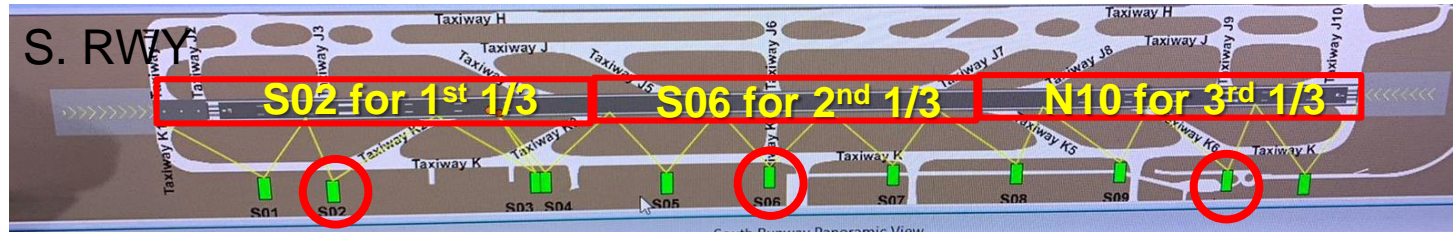
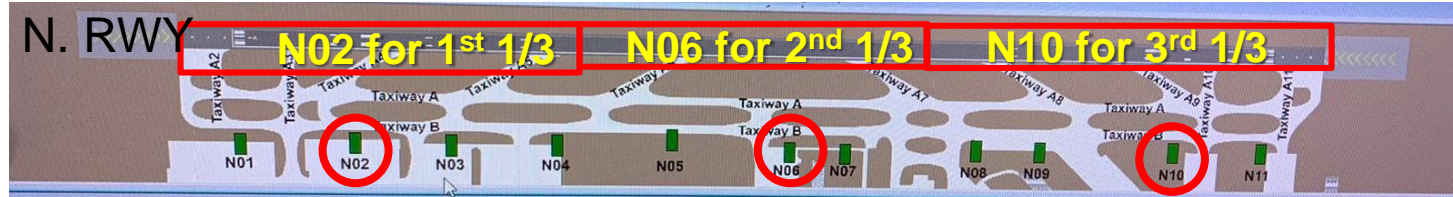
Runway Condition Assessment Matrix (RCAM) is used to assess the runway condition including runway condition code (RWYCC), contaminant coverage and contaminant depth.

# Thank You



# Check AFODDS / CCTV

## AFODDS:



Note: above camera numbers are for indication only, you may use other camera(s) if needed

## CCTV at AMIDS (North RWY only):

DRY



WET

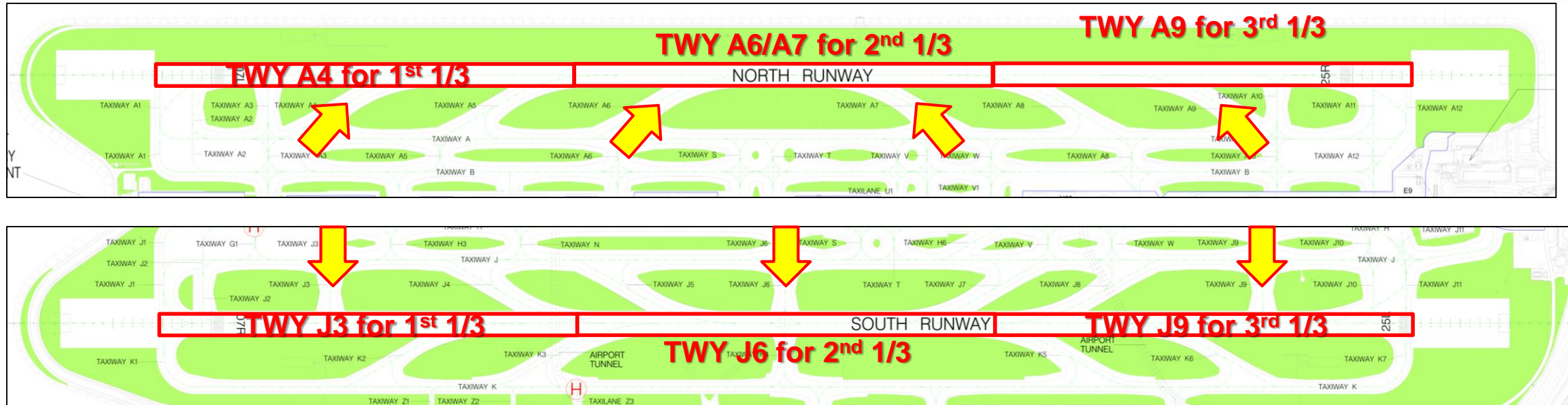


DRY

WET



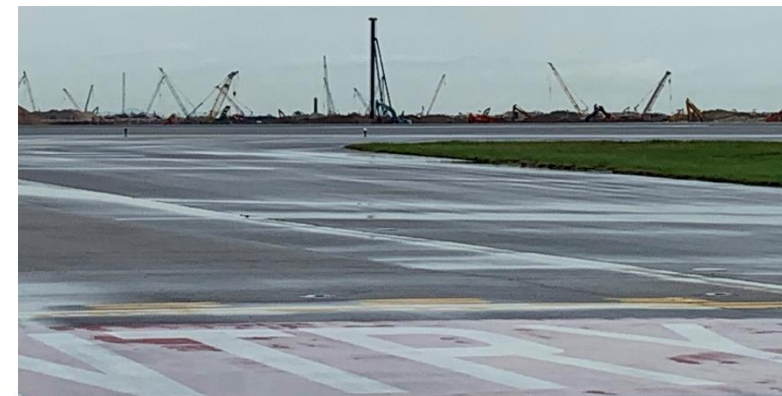
# Visual Check at Holding Points



Note: above holding point locations are for indication only, you may check at other holding point(s) if needed



DRY



WET

