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UNITING AVIATION

# ICAO MID GRF Implementation Webinar: Benefits & Implementation Challenges

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**Global Reporting Format (GRF) Methodology**

**ASPIG/2**

**(Virtual Meeting, 24 – 26 November 2020)**





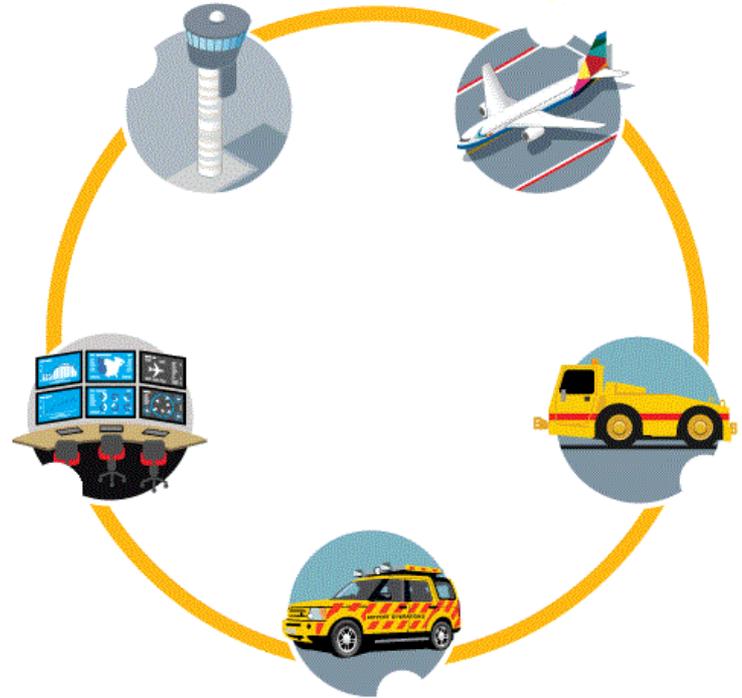
- Runway Safety: A global safety priority
- Runway excursions: highest risk category
  - Top contributing factor: Poor braking action
  - Leading factor: Contaminated Runway
- Mitigation by ICAO's Global Reporting Format (GRF)
  - World-wide implementation agreed
  - Applicability date: **5 November 2020** extended to **4 November 2021** (Ref: **SL AN 2/33-20/73**)





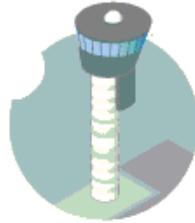
- Accurate reporting on runway surface conditions at the appropriate time.
- Runway Condition Report (RCR) will be used by the flight Crew to calculate the operational performance of the aeroplane during landing and take-off.
- Reduce the risk related to Runway Excursion.

# GRF: Runway Condition Report (RCR)



A **standardized common terminology and phraseology** for the description of runway surface conditions that can be **objectively** used by aerodrome operator inspection personnel, air traffic controllers, aircraft operators and flight crew.

# GRF: Stakeholder responsibilities



- **Aerodrome operators** assess the runway surface conditions, including contaminants, for each third of the runway length, and report them by means of a uniform runway condition report (RCR).
- **Aeronautical information services (AIS)** provide the information received in the RCR to end users (SNOWTAM).
- **Air traffic services (ATS)** convey the information received via the RCR and/or special air-reports (AIREP) to end users (voice communications, ATIS, CPDLC).
- **Aircraft operators** utilize the information in conjunction with the performance data provided by the aircraft manufacturers to determine if landing or take-off operations can be conducted safely and provide runway braking action special air-reports (AIREP).



Table II-1-5. Runway condition assessment matrix (RCAM)

Runway condition assessment matrix (RCAM)				
Runway condition code	Assessment criteria		Downgrade assessment criteria	
	Runway surface description		Aeroplane deceleration or directional control observation	Pilot report of runway braking action
6	• DRY		---	---
5	<ul style="list-style-type: none"> <li>• FROST</li> <li>• WET (The runway surface is covered by any visible dampness or water up to and including 3 mm depth)</li> </ul> <p><i>Up to and including 3 mm depth:</i></p> <ul style="list-style-type: none"> <li>• SLUSH</li> <li>• DRY SNOW</li> <li>• WET SNOW</li> </ul>		Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	GOOD
4	<p><i>-15°C and Lower outside air temperature:</i></p> <ul style="list-style-type: none"> <li>• COMPACTED SNOW</li> </ul>		Braking deceleration OR directional control is between Good and Medium.	GOOD TO MEDIUM
3	<ul style="list-style-type: none"> <li>• WET (*slippery wet* runway)</li> <li>• DRY SNOW or WET SNOW (any depth) ON TOP OF COMPACTED SNOW</li> </ul> <p><i>More than 3 mm depth:</i></p> <ul style="list-style-type: none"> <li>• DRY SNOW</li> <li>• WET SNOW</li> </ul> <p><i>Higher than -15°C outside air temperature<sup>1</sup>:</i></p> <ul style="list-style-type: none"> <li>• COMPACTED SNOW</li> </ul>		Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	MEDIUM
2	<p><i>More than 3 mm depth of water or slush:</i></p> <ul style="list-style-type: none"> <li>• STANDING WATER</li> <li>• SLUSH</li> </ul>		Braking deceleration OR directional control is between Medium and Poor.	MEDIUM TO POOR
1	<ul style="list-style-type: none"> <li>• ICE<sup>2</sup></li> </ul>		Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	POOR
0	<ul style="list-style-type: none"> <li>• WET ICE<sup>2</sup></li> <li>• WATER ON TOP OF COMPACTED SNOW<sup>2</sup></li> <li>• DRY SNOW or WET SNOW ON TOP OF ICE<sup>2</sup></li> </ul>		Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	LESS THAN POOR



## RCAM : Two Scenarios faced by Airports



- Airports exposed to snow and ice to be fully prepared to use the global reporting format (fully equipped, fully trained).



- Airports are not be exposed to snow and ice and thereby have no need to use the full global reporting format **other than for Wet/Water conditions**;



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5	<ul style="list-style-type: none"> <li>• FROST</li> <li>• WET (The runway surface is covered by any visible dampness or water up to and including 3 mm depth)</li> </ul> <p><i>Up to and including 3 mm depth:</i></p> <ul style="list-style-type: none"> <li>• SLUSH</li> <li>• DRY SNOW</li> <li>• WET SNOW</li> </ul>	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	GOOD
4	<p><i>-15°C and Lower outside air temperature:</i></p> <ul style="list-style-type: none"> <li>• COMPACTED SNOW</li> </ul>	Braking deceleration OR directional control is between Good and Medium.	GOOD TO MEDIUM
3	<ul style="list-style-type: none"> <li>• WET ("slippery wet" runway)</li> <li>• DRY SNOW or WET SNOW (any depth) ON TOP OF COMPACTED SNOW</li> </ul> <p><i>More than 3 mm depth:</i></p> <ul style="list-style-type: none"> <li>• DRY SNOW</li> <li>• WET SNOW</li> </ul> <p><i>Higher than -15°C outside air temperature<sup>1</sup>:</i></p> <ul style="list-style-type: none"> <li>• COMPACTED SNOW</li> </ul>	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	MEDIUM
2	<p><i>More than 3 mm depth of water or slush:</i></p> <ul style="list-style-type: none"> <li>• STANDING WATER</li> <li>• SLUSH</li> </ul>	Braking deceleration OR directional control is between Medium and Poor.	MEDIUM TO POOR
1	<ul style="list-style-type: none"> <li>• ICE <sup>2</sup></li> </ul>	Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	POOR
0	<ul style="list-style-type: none"> <li>• WET ICE <sup>2</sup></li> <li>• WATER ON TOP OF COMPACTED SNOW <sup>2</sup></li> <li>• DRY SNOW or WET SNOW ON TOP OF ICE <sup>2</sup></li> </ul>	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	LESS THAN POOR

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

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Runway condition code	Assessment criteria	Downgrade assessment criteria	
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5	<ul style="list-style-type: none"> <li>• WET (The runway surface is covered by any visible dampness or water up to and including 3 mm depth)</li> </ul>	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	<ul style="list-style-type: none"> <li>• WET ("slippery wet" runway)</li> </ul>	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	MEDIUM
2	<p><i>More than 3 mm depth of water or slush:</i></p> <ul style="list-style-type: none"> <li>• STANDING WATER</li> </ul>	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

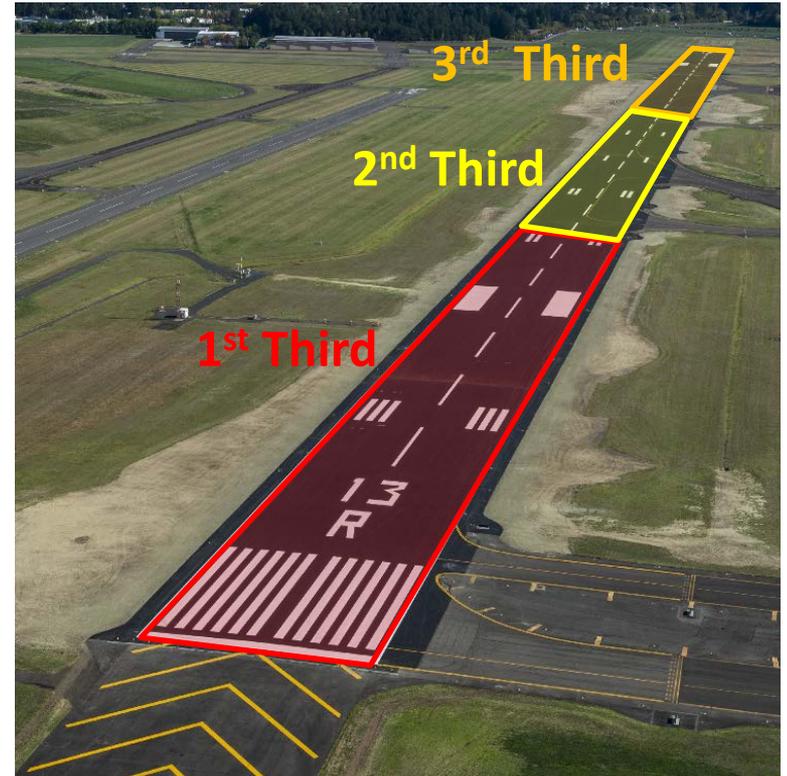


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4	<i>-15°C and Lower outside air temperature:</i> <ul style="list-style-type: none"> <li>• COMPACTED SNOW</li> </ul>	Braking deceleration OR directional control is between Good and Medium.	GOOD TO MEDIUM
3	<ul style="list-style-type: none"> <li>• WET ("slippery wet" runway)</li> <li>• DRY SNOW or WET SNOW (any depth) ON TOP OF COMPACTED SNOW</li> </ul> <i>More than 3 mm depth:</i> <ul style="list-style-type: none"> <li>• DRY SNOW</li> <li>• WET SNOW</li> </ul> <i>Higher than -15°C outside air temperature:</i> <ul style="list-style-type: none"> <li>• COMPACTED SNOW</li> </ul>	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	MEDIUM
2	<i>More than 3 mm depth of water or slush:</i> <ul style="list-style-type: none"> <li>• STANDING WATER</li> <li>• SLUSH</li> </ul>	Braking deceleration OR directional control is between Medium and Poor.	MEDIUM TO POOR
1	• ICE <sup>2</sup>	Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	POOR
0	<ul style="list-style-type: none"> <li>• WET ICE <sup>2</sup></li> <li>• WATER ON TOP OF COMPACTED SNOW <sup>2</sup></li> <li>• DRY SNOW or WET SNOW ON TOP OF ICE <sup>2</sup></li> </ul>	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	LESS THAN POOR

- **Aeroplane Deceleration or Directional Control Observation**
- **Pilot report on braking action/ special air-report (AIREP)**
- An assigned RWYCC 5, 4, 3 or 2 shall not be upgraded.
- An assigned RWYCC 1 or 0 can be upgraded.
- Upgrading of RWYCC 1 or 0 using the appropriate procedures shall not be permitted to go beyond a RWYCC 3.

- For each third of the runway length the Airport Operator assesses the:
  - % coverage of the contaminant
  - Depth of the contaminant
  - Type of the contaminant





5	<ul style="list-style-type: none"><li>• FROST</li><li>• WET (The runway surface is covered by any visible dampness or water up to and including 3 mm depth)</li></ul> <p><b>Up to and including 3 mm depth:</b></p> <ul style="list-style-type: none"><li>• SLUSH</li><li>• DRY SNOW</li><li>• WET SNOW</li></ul>	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	GOOD	60
4	<p><b>-15°C and Lower outside air temperature:</b></p> <ul style="list-style-type: none"><li>• COMPACTED SNOW</li></ul>	Braking deceleration OR directional control is between Good and Medium.	GOOD MEDIUM	
3	<ul style="list-style-type: none"><li>• WET ("slippery wet" runway)</li><li>• DRY SNOW or WET SNOW (any depth) ON TOP OF COMPACTED SNOW</li></ul> <p><b>More than 3 mm depth:</b></p> <ul style="list-style-type: none"><li>• DRY SNOW</li><li>• WET SNOW</li></ul> <p><b>Higher than -15°C outside air temperature:</b></p> <ul style="list-style-type: none"><li>• COMPACTED SNOW</li></ul>	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	MEDIUM	
2	<p><b>More than 3 mm depth of water or slush:</b></p> <ul style="list-style-type: none"><li>• STANDING WATER</li><li>• SLUSH</li></ul>	Braking deceleration OR directional control is between Medium and Poor.	MEDIUM POOR	27



# GRF in Practice

5	<ul style="list-style-type: none"><li>• FROST</li><li>• WET (The runway surface is covered by any visible dampness or water up to and including 3 mm depth)</li></ul> <p><b>Up to and including 3 mm depth:</b></p> <ul style="list-style-type: none"><li>• SLUSH</li><li>• DRY SNOW</li><li>• WET SNOW</li></ul>	Braking deceleration is normal for the wheel braking effort applied and directional control is normal.	GOOD	60	<b>90% Coverage</b>
4	<p><b>-15°C and Lower outside air temperature:</b></p> <ul style="list-style-type: none"><li>• COMPACTED SNOW</li></ul>	Braking deceleration OR directional control is between Good and Medium.	GOOD MEDIUM		<b>80% Coverage</b>
3	<ul style="list-style-type: none"><li>• WET ("slippery wet" runway)</li><li>• DRY SNOW or WET SNOW (any depth) ON TOP OF COMPACTED SNOW</li></ul> <p><b>More than 3 mm depth:</b></p> <ul style="list-style-type: none"><li>• DRY SNOW</li><li>• WET SNOW</li></ul> <p><b>Higher than -15°C outside air temperature<sup>1</sup>:</b></p> <ul style="list-style-type: none"><li>• COMPACTED SNOW</li></ul>	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	MEDIUM		<b>70% Coverage</b>
2	<p><b>More than 3 mm depth of water or slush:</b></p> <ul style="list-style-type: none"><li>• STANDING WATER</li><li>• SLUSH</li></ul>	Braking deceleration OR directional control is between Medium and Poor.	MEDIUM POOR	27	



# GRF in Practice

5	<ul style="list-style-type: none"> <li>• FROST</li> <li>• WET (The runway surface is covered by any visible dampness or water up to and including 3 mm depth)</li> </ul> <p><b>Up to and including 3 mm depth:</b></p> <ul style="list-style-type: none"> <li>• SLUSH</li> <li>• DRY SNOW</li> <li>• WET SNOW</li> </ul>	Braking deceleration is normal for the wheel braking effort applied and directional control is normal.	60 3	RWYCC 3/3/2
4	<p><b>-15°C and Lower outside air temperature:</b></p> <ul style="list-style-type: none"> <li>• COMPACTED SNOW</li> </ul>	Braking deceleration OR directional control is between Good and Medium.	GOOD 3	
3	<ul style="list-style-type: none"> <li>• WET ("slippery wet" runway)</li> <li>• DRY SNOW or WET SNOW (any depth) ON TOP OF COMPACTED SNOW</li> </ul> <p><b>More than 3 mm depth:</b></p> <ul style="list-style-type: none"> <li>• DRY SNOW</li> <li>• WET SNOW</li> </ul> <p><b>Higher than -15°C outside air temperature!:</b></p> <ul style="list-style-type: none"> <li>• COMPACTED SNOW</li> </ul>	Braking deceleration is noticeably reduced for the wheel braking effort applied OR directional control is noticeably reduced.	MEDIUM 2	
2	<p><b>More than 3 mm depth of water or slush:</b></p> <ul style="list-style-type: none"> <li>• STANDING WATER</li> <li>• SLUSH</li> </ul>	Braking deceleration OR directional control is between Medium and Poor.	MEDIUM 27	



- The RCR consists of two sections:
  - **Aeroplane take-off and landing performance calculations;** and
  - **Situational awareness** of the surface conditions on the runway, taxiways and aprons.



- National regulatory Framework Implementation on GRF.
- GRF Deployment on Aerodromes:
  - Runway surface assessment and reporting accuracy.
  - Operational Personnel qualification.
  - Coordination process with concerned stakeholders.
  - Management of change.



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# GRF Implementation Challenges

## Training, Training and Training



TRAINAIR  
PLUS™

# Global Reporting Format (GRF) for Runway Surface Conditions Courses

This course aims to assist aviation personnel to understand, use and meet the new ICAO requirements for runway surface condition assessment and reporting requirements as outlined in ICAO Annex 14, Volume 1; Doc 10064 and Circular 355.

## ICAO Compliance date 4 November 2021



### ICAO-ACI Global Reporting Format (GRF)

#### Target Population:

- Airport Operations Management, Officers and Staff
- Airport Emergency Managers, Officers and Staff
- Airport Safety Managers, Officers and Staff

#### Structure of the course:

Course duration: 3 Hours  
Delivery mode: Online Course  
Language of instruction: English

### ICAO-IATA Introduction to the Global Reporting Format (GRF)

#### Target Population:

- Flight crew
- Airline operational staff
- Dispatchers

#### Structure of the course:

Course duration: 3 Hours  
Delivery mode: Online Course  
Language of instruction: English





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# ICAO Provisions on GRF

ICAO International Standards and Recommended Practices

Annex 14 to the Convention on International Civil Aviation

Aerodromes

ICAO

Doc 10066

PROCEEDINGS FOR AIR NAVIGATION SERVICES

Aeronautical Information Management

ICAO International Standards and Recommended Practices

Annex 6 to the Convention on International Civil Aviation

Operation of Aircraft

ICAO International Standards and Recommended Practices

Annex 8 to the Convention on International Civil Aviation

Airworthiness of Aircraft

ICAO

Doc 9981

PROCEEDINGS FOR AIR NAVIGATION SERVICES

Aerodromes

Second Edition, 2016



This edition supersedes, on 8 November 2016, all previous editions of Doc 9981.

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ICAO

Circular 355

Assessment, Measurement and Reporting of Runway Surface Conditions



Approved by and published under the authority of the Secretary General.

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ICAO

Doc 10064

Aeroplane Performance Manual

First Edition (Advanced unedited) — 2020

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This document is an unedited version of an ICAO publication and has not yet been reviewed in final form. As its content may still be supplemented, removed, or otherwise modified during the editing process, ICAO shall not be responsible whatsoever for any errors or omissions incurred as a result of its use.

Approved by and published under the authority of the Secretary General.

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ICAO International Standards and Recommended Practices

Annex 8 to the Convention on International Civil Aviation

Airworthiness of Aircraft

Twelfth Edition, July 2018



This edition incorporates all amendments and supersedes, on 8 November 2018, all previous editions of Annex 8.

For information regarding the applicability of the Standards and Recommended Practices, see sections 1.1, 2.1.3.1 and 2.1 of Part II, and sections 1.1 of Parts IIIA, III, IV, V, VI, VII, VIII and IX, and the Foreword.

INTERNATIONAL CIVIL AVIATION ORGANIZATION



### **Action by the Meeting:**

The meeting is invited to review, update and agree on the milestones identified in the Draft MID Region GRF Implementation Plan Template as at Appendix A to be presented to the MIDANPIRG/18 & RASG-MID/8 virtual meeting for endorsement and agree that the following Draft Conclusion will replace and supersede the ***RSC Conclusions 7/8 on GRF IMPLEMENTATION AND DEPLOYMENT AT AERODROMES***

### **Draft Conclusion 2/2: MID REGION GRF Implementation Action Plan**

That States, nominate National GRF implementation Focal Points for coordination of all issues related to GRF Implementation, including the provision of regular progress reports/updates on the subject to the ICAO MID Office using the MID Region GRF Implementation Plan Template at **Appendix A**.





APPENDIX A

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

**MID REGION GRF IMPLEMENTATION ACTION PLAN TEMPLATE**

(to be tailored and detailed by each State)

STATE NAME \_\_\_\_\_

Milestone ID	ACTION	ENTITY RESPONSIBLE	TARGET DATE <sup>1</sup>	EFFECTIVE DATE	REMARKS
<b>GRF 1</b>	Review ICAO provisions and guidance and other Organisations guidance (see below)	CAA	<b>30/12/2020</b>		
<b>GRF 2</b>	Designate a focal point to coordinate implementation activities at the national level	CAA	<b>30/12/2020</b>		
<b>GRF 3</b>	Identify concerned focal points in each entity (CAA, Airport, ANSP, Aircraft operators – include BA, GA and military as applicable)	CAA, Airports, ANSP, Aircraft operators	<b>30/12/2020</b>		
<b>GRF 4</b>	Establish an Implementation Coordination Team including staff from the identified stakeholder entities	CAA	<b>15/01/2021</b>		
<b>GRF 5</b>	Conduct the initial training for the CAA, Airports, ANSP and Aircraft Operators' personnel (e.g. ICAO/ACI/IATA online courses, national awareness workshop, etc.)	CAA	<b>15/02/2021</b>		
<b>GRF 6</b>	Identify regulations, standards, procedures and guidance material to be developed/amended	National Focal Point and the Implementation Coordination Team	<b>15/02/2021</b>		
<b>GRF 7</b>	Develop a detailed national implementation plan and safety risk assessment. Each entity should also establish its specific implementation plan and safety risk assessment.	CAA, Airports, ANSP, Aircraft operators	<b>30/02/2021</b>		

<sup>1</sup> Target dates are indicative only and should be replaced by realistic dates determined by individual State

Milestone ID	ACTION	ENTITY RESPONSIBLE	TARGET DATE <sup>1</sup>	EFFECTIVE DATE	REMARKS
<b>GRF 8</b>	Identify the necessary means and resources for the implementation (human, financial and material resources)	National Focal Point and the Implementation Coordination Team	<b>30/02/2021</b>		
<b>GRF 9</b>	Coordinate with Airport Runway Safety Teams	Airports	<b>28/02/2021</b>		
<b>GRF 10</b>	Develop and promulgate regulations and standards	CAA	<b>30/03/2021</b>		
<b>GRF 11</b>	Develop procedures and guidance material (translate if required)	National Focal Point and the Implementation Coordination Team	<b>15/04/2021</b>		
<b>GRF 12</b>	Provide the necessary means and resources for the implementation (human, financial and material resources)	CAA, Airports, ANSP, Aircraft operators	<b>31/05/2021</b>		
<b>GRF 13</b>	Conduct On-the-Job Training (OJT) on the implementation	CAA, Airports, ANSP, Aircraft operators	<b>30/06/2021</b>		
<b>GRF 14</b>	Perform tests/trials prior to the effective implementation	All	<b>31/07/2021</b>		
<b>GRF 15</b>	Applicability date for the new methodology for assessing and reporting runway surface conditions	All	<b>4/11/2021</b>		

**Notes:** ICAO Runway Safety Go-Team Assistance Missions are available to support States and Airports. ACI APEX Safety Reviews are also available to support Airports.

References:

- ICAO GRF web site <https://www.icao.int/safety/Pages/GRF.aspx>
- ICAO MID GRF Regional Webinar: <https://www.icao.int/Meetings/webinar-series/Pages/Global-Reporting-Format-Methodology-Webinar.aspx>

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