

**AD 1.2 RESCUE AND FIRE FIGHTING SERVICES AND SNOW PLAN****1. RESCUE AND FIREFIGHTING SERVICES****1.1 Regulatory references**

The requirements for RFF level of protection at certified aerodromes are established in paragraphs 454-470 of Civil aerodrome (heliport) standards Order of the Minister for Investment and Development of the Republic of Kazakhstan dated March 31, 2015 № 381

**1.2 Determination of the RFFS level of protection**

RFF level of protection of certified aerodromes is based on the overall length of the aircraft with the longest fuselage and the maximum width of the fuselage of the aircraft normally using at the airport.

If the number of movements of the aeroplanes in the highest category normally using the aerodrome is less than 700 the RFF level of protection can be decreased by one category of the determined category. The RFF level of protection for all certified aerodromes are given in section AD 2.6 for the respective aerodromes.

The amounts of water for foam, discharge rate and RFF vehicles are provided at certified aerodromes for the relevant airport category in compliance with the requirements of Annex 14, Volume 1 of ICAO. These requirements are described in the following table 1:

**Table 1:**

Minimum usable amounts of extinguishing agents						
Aerodrome category	Water (l)		Discharge rate l/m		Amount of RFF vehicles	
	ICAO Annex 14 vol.1	KZ Aerodrome Standard	ICAO Annex 14 vol.1	KZ Aerodrome Standard	ICAO Annex 14 vol.1	KZ Aerodrome Standard
1	350	745	350	360	1	1
2	1000	1580	800	840	1	1
3	1800	2420	1300	1200	1	1
4	3600	7500	2600	3840	1	2
5	8100	11160	4500	4800	1	2
6	11800	14140	6000	6000	2	3
7	18200	22320	7900	7980	2	3
8	27300	30340	10800	10800	3	4
9	36400	38130	13500	13560	3	5
10	48200	45105	16600	15600	3	5

All certified aerodromes on duties are keeping in readiness the required rescue, fire-fighting and other equipment available in case of use in emergency situations of the aerodrome responsible areas.

**2. SNOW PLAN****2.1 Organization of the winter service**

At all certified aerodromes, the list of which is given in AD 1.5, the aerodrome operator is responsible for the operational maintenance of the movement area of the aerodrome (removal of contaminants, conducting measurements, assessments of the condition and worthiness for operation), providing relevant information about the movement area.

## 2.2 Surveillance of movement areas

The aerodrome maintenance service controls the condition of the movement area during its operational hours, which are given in AD 2.3 for each certified aerodrome.

The validity period of any SNOWTAM is 8 hours, and the current SNOWTAM cannot be canceled, and therefore SNOWTAMs with an unexpired validity period may be valid at scheduled aerodromes during non-working hours. Such SNOWTAMs may not be relevant in the event of continued precipitation and other weather conditions that contribute to significant changes in runway surface conditions. In such cases, the aerodrome operator's AS specialist shall include information on the date and time of the next runway condition assessment in the "open text comments" section of the situational awareness section.

More detailed information of snow clearing procedures at aerodromes, in particular, the types of equipment used, priorities for precipitation removal are given in AD 2.7 for each certified aerodrome.

## 2.3 Measuring methods and measurements taken

### 2.3.1 Runway surface condition assessment

All certified aerodromes in Kazakhstan assess runway surface condition according principles laid down by ICAO taking into account the contaminant type, coverage and depth of the contaminants, as well as the pilot's reports on braking efficiency.

These elements are reported in a globally harmonized format and are more commonly known as the Global Reporting Format (GRF).

The GRF works as follows:

Each time there is a significant change in runway surface condition, the aerodrome operator assesses the surface condition for each third of the runway and produces a Runway condition report (RCR), containing a runway condition code (RWYCC) and a set of information describing the runway surface condition, including type of contamination, thickness, coverage for each third of runway.

The determination of the runway condition code is based on the Runway Condition Assessment Matrix (RCAM) which maps the runway surface condition description to aircraft braking performance.

The Runway Condition Assessment Matrix (RCAM) is shown in Table 2.

The runway length taken into account for the assessment and reporting of the runway surface condition is the physical length of the runway excluding runway end safety areas (RESAs), stopways and clearways.

The pilot uses the information disseminated in conjunction with performance data provided by the aircraft manufacturers to determine whether landing or take-off operations can be conducted safely. When the braking performances observed by the pilot do not correspond to that communicated, the pilots produce a braking action report (AIREP) which ATS communicates to the aerodrome operator with a view to a possible new assessment of the runway surface condition. This AIREP will be transmitted by the crew as soon as possible after landing, if possible before leaving the control frequency, in particular to be taken into account by the following crews. The transmission of the AIREP uses the conventional expressions agreed in the RCAM matrix.

**Table 2: Runway Condition Assessment Matrix applicable at Kazakhstan aerodromes**

Runway condition assessment matrix (RCAM)			
Assessment criteria		Downgrade assessment criteria	
Runway condition code	Runway surface description	Aeroplane deceleration or directional control observation	Pilot report of runway braking action
6	• DRY	-	-

Table 2: Runway Condition Assessment Matrix applicable at Kazakhstan aerodromes

Runway condition assessment matrix (RCAM)			
Assessment criteria		Downgrade assessment criteria	
Runway condition code	Runway surface description	Aeroplane deceleration or directional control observation	Pilot report of runway braking action
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> <b>Up to and including 3 mm depth:</b> <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	<b>–15°C and Lower outside air temperature:</b> <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> <b>More than 3 mm depth:</b> <ul style="list-style-type: none"> <li>DRY SNOW</li> <li>WET SNOW</li> </ul> <b>Higher than –15°C outside air temperature:</b> <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	<b>More than 3 mm depth of water or slush:</b> <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</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</li> <li>WATER ON TOP OF COMPACTED SNOW</li> <li>DRY SNOW or WET SNOW ON TOP OF ICE</li> </ul>	Braking deceleration is minimal to non-existent for the wheel braking effort applied OR directional control is uncertain.	LESS THAN POOR

### 2.3.2 Measuring the depth of deposits

The average depth of the layer on each third of runway is measured with the precision of up to 04 mm for standing water, up to 03 mm for slush, wet snow and dry snow.

Measurements of the depth of these deposits are made on each third of the runway length at a distance of 5-10 m from its axis on the right and left, by triple measurements at the estimated points and calculating the arithmetic mean values of the measured depths on each third of the runway.

The depth of deposit is measured using a metal millimeter ruler, and the water layer is determined using an optical ruler OL-1.

The values of the deposit depth are measured and reported in millimeters.

In cases where there is no need for measurements, information about the depth of deposit is not reported.

When no information is to be reported, insert “NR” at its relevant position in the message of SNOWTAM to indicate to the user that no information exists

2.3.3 Friction measurements

At the aerodromes of Aktau, Aktobe, Almaty, Astana, Atyrau, Karaganda, Kostanay, Kokshetau, Pavlodar, Semey, Taldykorgan, Taraz, Tengiz, Ust-Kamenogorsk, Shymkent, an aerodrome brake trolley ATT-2 is used for the measurement of friction.

At the aerodromes of Kyzylorda, Uralsk, an aerodrome brake trolley ATT-RWY is used for the measurement of friction.

At the aerodromes of Petropavlovsk, Usharal, an aerodrome brake trolley ATT-2M is used for the measurement of friction.

At the aerodromes of Almaty, Astana, Atyrau, Balkhash, Zhezkazgan, Karaganda, Shymkent, electronic portable decelerometer DEP-5A is used for the measurement of friction.

At the aerodromes of Zaisan, Turkistan, Urdzhar, electronic portable decelerometer DE-01 is used for the measurement of friction.

At the aerodromes of Aktau, Turkistan, Skiddometer BV 11 is used for the measurement of friction.

The friction measurement is made on each third along the runway 5-10m on either side of the runway centerline.

When measuring the friction with a decelerometer, the number of measurements on each section should be at least 8 (4 to the right and left of the runway centerline).

If the conditions on the edges of the cleared runway area differ significantly from the conditions within basic measurement area, additional measurements will be made when necessary.

The values of the friction measurements coefficients are published in the situational awareness section of the Runway Condition Report (RCR), provided that the fricton measurements are used as part of the overall assessment of the runway surface covered with compacted snow or ice.

Friction measurements on loose dirt, in particular such as snow and slush, are unreliable and the values of the friction measurements coefficient are provided only at the request of the pilots.

Only the measured friction coefficient values are provided.

Table 3: Conversion of the measured friction coefficient values to the normative value of the friction coefficients for ATT-2.

Measured coefficient	0,1	0,15	0,18	0,2	0,25	0,26	0,29	0,3	0,35	0,39	0,4	0,45	0,5
Normative friction coefficient	0,26	0,29	0,3	0,32	0,34	0,35	0,36	0,37	0,39	0,41	0,42	0,45	0,49

The measured values of the decelerometer correspond to the normative values of the friction coefficient given in Table 3.

2.4 Actions taken to maintain the usability of movement areas

2.4.1 Runway width available

During the winter season the basic aim is to clear the runway up to the published runway width. The actual cleared runway width may be less than the published width.

2.4.2 Improvement of surface friction decrease drag effect for rolling

The intention is that the aerodrome operator, during the operation hours of the aerodrome, maintains the friction characteristics on the runway at level not lower than the medium braking efficiency, and also removes contaminants in order to decrease drag effect for rolling of the aircraft during take-off as far as weather conditions and traffic density allow.

These aims will be achieved in most cases by:

- Applications of plow-brush, screw-rotor snowplows, graders, bulldozers, wind machines for removing snow, slush, water.
- The use of thermal machines, chemical reagents and their combinations for the removal of ice, compacted snow.

The list of de-ice products are used by certified aerodromes is published in AIC A.

## 2.5 System and means of reporting

Reports on the condition of the runway are formed by aerodrome maintenance service specialists of certified aerodromes. Reports are transmitted to ATS and AIS.

Runway condition information is reported in a Runway Condition Report (RCR) which consists of 2 sections ordered as follows :

A section containing information necessary for the aeroplane performance calculation:

- aerodrome location indicator;
- date and time of the assessment;
- lowest runway designation number;
- runway condition code for each third of the runway;
- percentage contaminant coverage for each third of the runway;
- depth of loose contaminants;
- condition description for each runway third;
- width of the runway to which the RWYCC applies, if lower than the published width.

A situational awareness section containing additional information relevant to safe operations:

- reduced runway length where applicable;
- drifting snow on the runway;
- loose sand on the runway;
- chemical treatment on the runway;
- snowbanks on the runway;
- snowbanks on the taxiway;
- snowbanks adjacent to the runway;
- taxiway conditions;
- apron conditions;
- measured friction coefficient and friction measuring device;
- plain language remarks.

When the runway is wholly or partly contaminated by standing water, snow, slush, ice or frost, or is wet

associated with the clearing or treatment of snow, slush, ice or frost, the runway condition report should be disseminated through the AIS and ATS services.

When the runway is wet, not associated with the presence of standing water, snow, slush, ice or frost, the assessed information should be disseminated using the runway condition report through the ATS only

On the basis of the RCR produced by the aerodrome operator, ATS will disseminate this information to crews on the frequency and on the ATIS. This communication will be completed by the dissemination of a SNOWTAM in the cases provided for by the regulations.

## 2.6 The cases of runway closure

Weather conditions can change rapidly, and access to the runway may be limited due to the high intensity of flights. In cases where the state of the taxiway is identical to the runway, then the assessment of the runway condition can be carried out on the basis of an assessment of the surface condition of the exit and main taxiways, when access to the runway is limited due to take-off and landing operations performed on it, and weather conditions change rapidly.

When the condition of the runways no longer allows operations to be carried out safely in particular when the runway condition code is lower than 1 and/or the measured friction coefficients are lower than the minimum values given in Table 4. the aerodrome operator communicates the information available to him to the ATS and AIS, when present on the platform, in view of a possible suspension of operations on the movement area of the aerodrome.

In this case, this situation is reported to the crews by NOTAM, as well as on the frequency and on the ATIS.

When the need arises, a runway or the movement area or parts of it can be closed for a period of time required for the inspection of pavement conditions, snow and ice clearance or the measurement or the estimation of the friction level. The decision on the closure of a runway or another part of the movement area will be made by the aerodrome operator.

**Table 4: The minimum level of friction established in Kazakhstan for various types of friction measurement equipment**

ATT-2	Skiddometer	Decelerometer DAP-5A
0,18	0,18	0,30

## 2.7 Distribution of information about snow conditions

### 2.7.1 Seasonal snow plan

A seasonal plan (AIC A), which contains seasonal supplements and changes to the standing Snow plan (AIP, AD 1.2) will be issued annually before the normal onset of winter conditions.

### 2.7.2 Dissemination information about runway surface condition by ATS organizations

Runway surface condition information shall be passed to aircraft by the ATS during their hours of operation and aerodrome operator's operation hours using frequency only in case crews haven't already received all or part of the information from other sources, including SNOWTAMs, ATIS. The GRF information disseminated by ATS will be given in priority on the ATIS if available.

The communication of information by runway thirds by ATS units is done in the direction of landing or take-off operations.

The following information will be transmitted via ATIS for each third of the runway:

- operational runway in use at time of the issuance;
- RWYCC for operational RWY for each third in the operational direction;
- condition description, coverage and depth (for loose contaminant);
- width of operational RWY to which RWYCC apply if less than published;

- reduced length if less than published.

This transmission may be partial to take into account the congestion of the control frequency. However, all available information may be transmitted at the request of the crew.

### **2.7.3 Dissemination information about runway surface condition by AIS**

This information concerning snow, slush, ice, frost, standing water or water associated with snow, slush, ice or frost on the movement area is also disseminated by means of SNOWTAM.

The AIS provider issues a SNOWTAM for a maximum validity of 8 hours for each RCR received.

When the runway is considered as "slippery wet", a NOTAM indicating the length of the degraded runway section is issued in addition to the preceding communications.

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