

Wettervorhersagen als Schlüsselemente für die proaktive Steuerung der Flugoperation

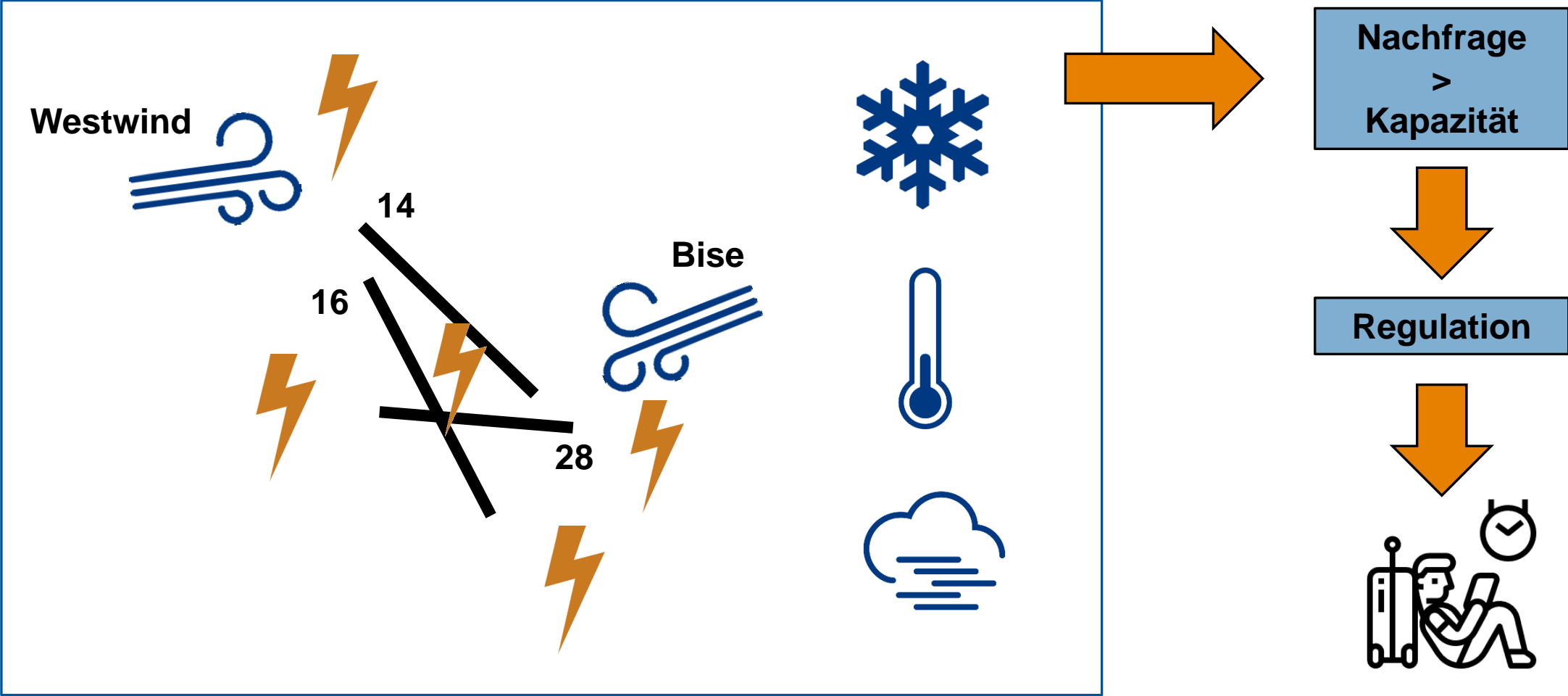


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INHALTE

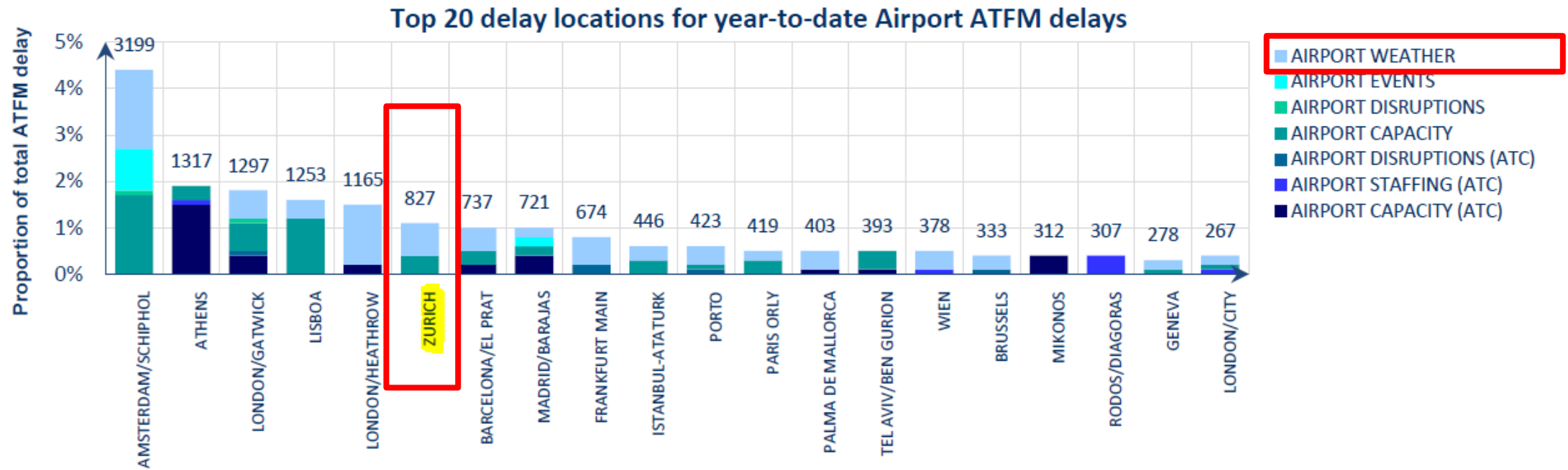
1. Wettereinflüsse am Flughafen Zürich
2. Ansätze zur Steuerung des Flugbetriebs
3. Wichtigkeit von Wetterprognosen zur Steuerung des Flugbetriebs
4. O2-Briefing Sheet zur frühzeitigen Erkennung von betrieblichen Einschränkungen

WETTEREINFLÜSSE AM FLUGHAFEN ZÜRICH



WETTEREINFLÜSSE AM FLUGHAFEN ZÜRICH

ATFM AIRPORT DELAY STATISTIKEN (1)



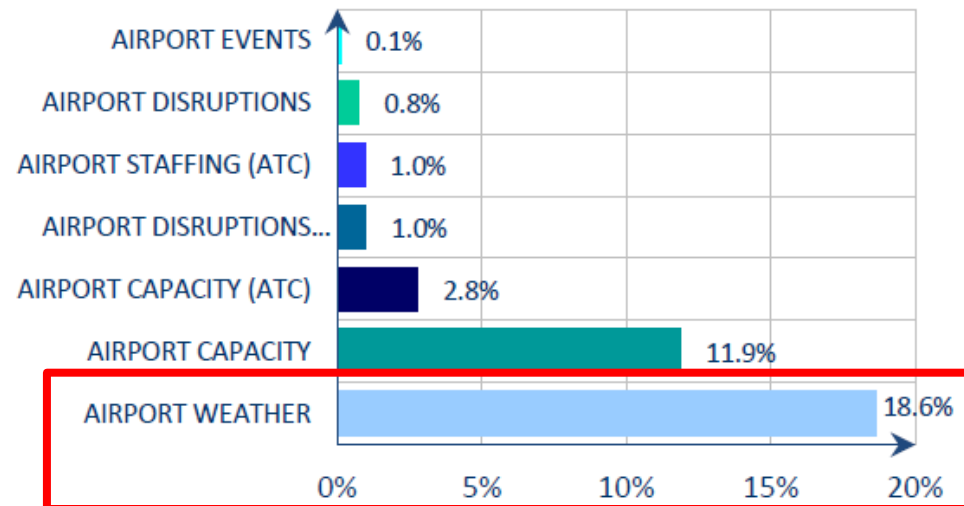
Quelle: NM Monthly Network Operations Report – Analysis, Eurocontrol, October 2019

<https://www.eurocontrol.int/publication/network-operations-report-october-2019>

WETTEREINFLÜSSE AM FLUGHAFEN ZÜRICH

ATFM AIRPORT DELAY STATISTIKEN (2)

Reasons for airport delays in October 2019



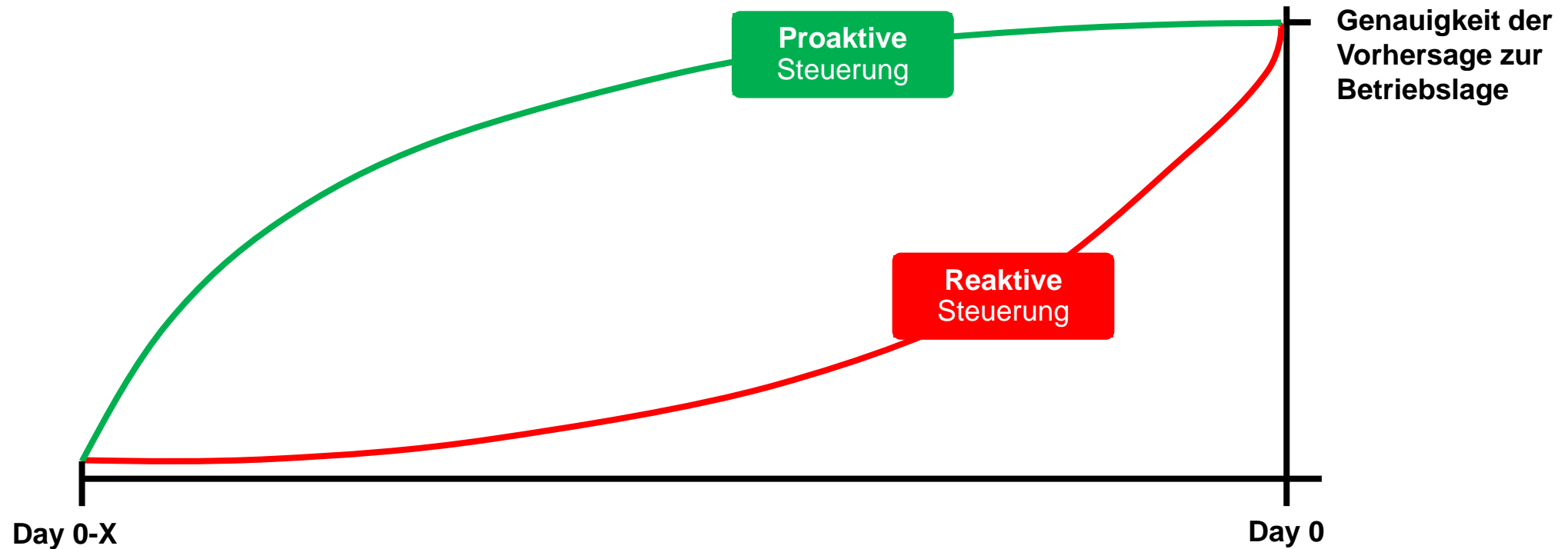
Airports accounted for 36.1% of all ATFM delays in October 2019, mainly due to weather and airport capacity.

Quelle: NM Monthly Network Operations Report – Analysis, Eurocontrol, October 2019

<https://www.eurocontrol.int/publication/network-operations-report-october-2019>

ANSÄTZE ZUR STEUERUNG DES FLUGBETRIEBS

PROAKTIVE VS. REAKTIVE STEUERUNG



WICHTIGKEIT VON WETTERPROGNOSEN PRODUKTE UND INFORMATIONEN

Meteogram Airport Zürich, 06.11.2019 9 - 8 UTC

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra


Eidgenössisches Departement des Innern EDI
Département fédéral de l'intérieur DFI
Bundesamt für Meteorologie und Klimatologie MeteoSchweiz
Office fédéral de météorologie et de climatologie MétéoSuisse

	Time (UTC)																							
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8
12000 ftmsl	220/19	250/18	260/15	280/14	290/14	290/18	280/17	270/16	290/15	290/16	290/11	290/08	290/10	280/08	250/10	250/11	240/10	240/15	230/22	240/28	230/26	230/31	240/33	230/32
8000 ftmsl	280/17	260/14	280/12	270/17	270/15	250/15	260/14	280/11	280/16	270/18	270/14	260/15	250/15	250/15	240/19	230/16	220/18	230/16	220/17	230/19	230/26	230/27	240/28	230/35
4000 ftmsl	270/23	270/18	270/17	270/15	270/14	250/15	270/13	260/17	250/17	270/18	260/20	260/20	260/18	260/17	250/18	250/17	240/16	220/15	200/11	170/12	180/11	180/13	180/13	180/13
3000 ftmsl	270/22	280/14	260/15	250/12	260/11	250/14	260/13	250/20	260/19	260/14	250/22	250/22	250/21	250/19	250/17	240/17	240/15	230/14	190/09	140/07	160/04	150/04	150/04	150/04
2000 ftmsl	240/09	240/09	240/08	240/09	250/11	250/15	240/14	240/19	250/14	230/13	240/12	240/13	240/11	220/06	220/08	230/08	240/06	170/04	220/02	120/02	330/01	080/01	080/01	080/01
GND-North	240/07	240/07	240/07	240/07	240/07	240/07	250/06	220/04	220/04	240/05	190/04	210/04	220/04	190/03	150/01	140/03	130/03	150/03	180/01	340/02	330/01	340/02	090/02	100/01
Wind Gusts North							19	10		11		10												
GND-South	240/07	240/07	240/07	240/07	240/07	240/07	240/06	230/04	220/05	240/04	210/03	210/06	240/03	190/03	190/03	200/02	200/03	190/02	120/01	310/01	240/01	090/01	100/02	100/01
Wind Gusts South							18	12		13		10	10											
TfTd	08/06	09/05	09/06	09/06	10/06	09/06	09/05	08/05	07/05	07/05	07/05	06/05	06/04	06/04	05/04	05/04	05/04	05/04	05/03	05/03	04/03	04/03	05/04	05/04
QNH	1006	1006	1006	1006	1006	1006	1006	1006	1007	1007	1007	1007	1007	1007	1007	1006	1006	1005	1005	1004	1004	1004	1004	1004
Ceiling	3500	3500	3500	3500	3500	3500	6100	5200	5400	5700	6100	6400	6000	5700	5600	6000	5800	5600	5800	5600	5700	6100	5500	6200
Prob Ceiling < 200ftagl	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely
Prob Ceiling < 900ftagl	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely
Prob Ceiling < 1500ftagl	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely
Visibility	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999
Prob Visibility < 5000m	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely
Prob Visibility < 400m	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely
Prob CB/TS A/P	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely	unlikely
Precipitation	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA	SHRA

9 10 11

Probability: unlikely = 0-30%, likely = 31-70%, certain = 71-100%
Data source: Cosmo-1, INCA, TAF

TAF LSZH 051725Z 0518/0624 19005KT 5000 BR OVC004 TX05/0613Z
TNM02/0601Z TEMPO 0518/0520 OVC005 BECMG 0519/0522
3000 BR PROB40 0601/0606 PRFG OVC004
0400 FZFG VV002 BECMG 0609/0611 6000
0611/0613 23008KT FEW010 PROB40 0614/0621
0621/0624 BKN060=



O² briefing sheet
created on 5th December 2019, 18:05 LT

NEU

Expected meteorological conditions during operational hours

	19 LT	20 LT	21 LT	22 LT	23 LT	05 LT	06 LT	07 LT	08 LT	09 LT	10 LT	11 LT	12 LT	13 LT	14 LT	15 LT	16 LT	17 LT					
Wind (deg kt)	VRB/03	VRB/03	VRB/03	VRB/03	VRB/03	210/03	160/02	190/03	200/04	200/03	220/03	150/02	220/03	120/02	170/02	140/02	160/03	190/06					
Wind (deg)	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	12					
W (deg)	00/M01	M01/M01	M01/M02	M01/M02	M01/M02	M01/M02	M01/M02	M01/M03	M01/M03	M01/M03	00/M02	00/M02	02/M02	03/M01	04/M01	05/M01	05/00	05/M01	04/M01				
W (deg)	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL			
not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely			
very likely	very likely	very likely	very likely	very likely	very likely	very likely	very likely	very likely	likely	likely	likely	likely	likely	likely	not likely	not likely	not likely	not likely	not likely	not likely			
LVT	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely	not likely

Expected operational concept

	19 LT	20 LT	21 LT	22 LT	23 LT	05 LT	06 LT	07 LT	08 LT	09 LT	10 LT	11 LT	12 LT	13 LT	14 LT	15 LT	16 LT	17 LT
Concept	Nord	Nord	South	South	South	Sued	Sued	Nord	Nord	Nord	Nord	Nord	Nord	Nord	Nord	Nord	Nord	Nord
Likelihood	NIL	NIL	very likely	very likely	very likely	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
DEP RWY16	0.1	0.9	NIL	NIL	NIL	NIL	NIL	0.7	0.3	7.5	2.4	3.7	8.0	7.7	1.1	0.1	1.3	4.3

Expected traffic situation

	19 LT	20 LT	21 LT	22 LT	23 LT	05 LT	06 LT	07 LT	08 LT	09 LT	10 LT	11 LT	12 LT	13 LT	14 LT	15 LT	16 LT	17 LT
ARR planned	28	18	28	11	0	0	14	4	26	14	21	36	13	3	9	20	36	16
DEP planned	17	17	13	8	0	0	13	32	11	25	16	17	41	18	5	11	18	38

Expected meteorological conditions during night

	00 LT	01 LT	02 LT	03 LT	04 LT	05 LT
Temperature/dewpoint (deg C)	M01/M02	M01/M02	M01/M02	M01/M02	M01/M02	M01/M02
Ceiling (ft AGL)	400	400	300	300	300	300
Precipitation	NIL	NIL	NIL	NIL	NIL	NIL

O2 BRIEFING-SHEET

INFORMATIONEN

Format	HTML-Sheet
Versandzeitpunkte (LT)	0519 / 1119 / 1519 / 1819 / 2219 (automatisch)
Prognosezeitraum	jeweils 24 Stunden
Datenauflösung	stündlich
Datenfelder	Meteogramm + RWY Konzept Vorhersage + Erwartete ARR und DEP gem. Flugplan + Erwartete meteorologische Verhältnisse in der Nacht + PRIDEP Empfehlung basierend auf Anzahl ARR und LVP Wahrscheinlichkeit

O2 BRIEFING SHEET

ZIELE UND NEXT STEPS

Ziele

- Stakeholder-übergreifendes Situationsbewusstsein der Zukunft schaffen
- Betriebliche Einschränkungen aufgrund der zur erwartenden Witterungsverhältnisse aufzeigen
- Einheitlichkeit des Handelns schaffen
- Förderung der proaktiven Entscheidungsfindung

Nächste Schritte

- Erweiterung der Datenfelder und bessere Datenauflösung
- Erweiterung der Prognoseperiode
- Weiterausbau der Datenschnittstellen
- Ausarbeitung von gemeinsam abgestimmten Mitigationsmassnahmen basierend auf vordefinierten Schwellwerten
- Online-Plattform mit interaktivem Dashboard, zugänglich für alle Stakeholder
- Erweiterter Informationsaustausch mit anderen Flughäfen

