

AIRFRANCE 



Paris CDG Airport experience in A-CDM implementation

ICAO A-CDM seminar LIMA
27/08/2015



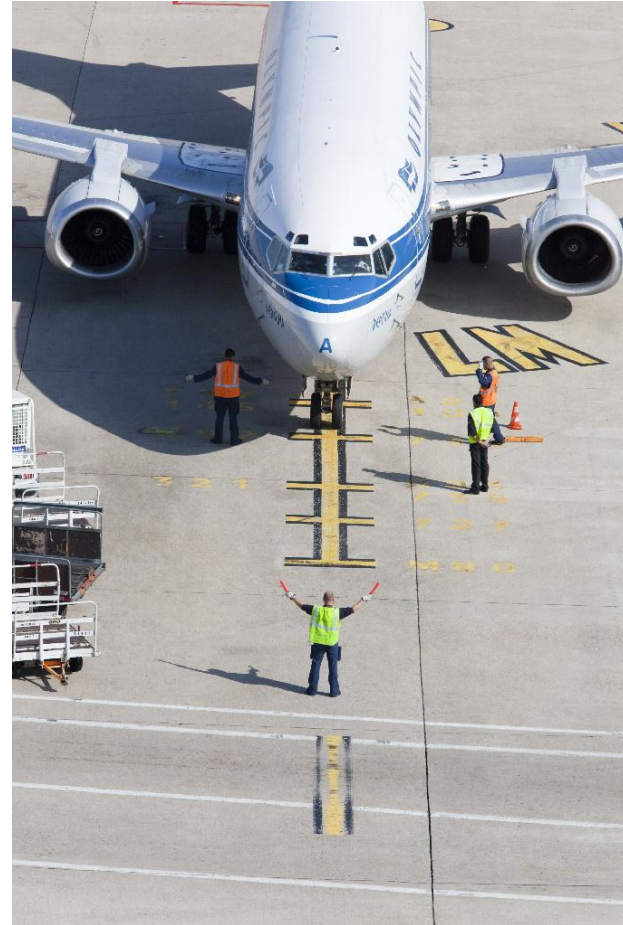


AGENDA

- Challenges
- CDM@CDG Program
 - Organisation
 - Work Breakdown Structure
 - Achievements
- Perspectives
- Conclusion
 - Results
 - Lessons Learnt

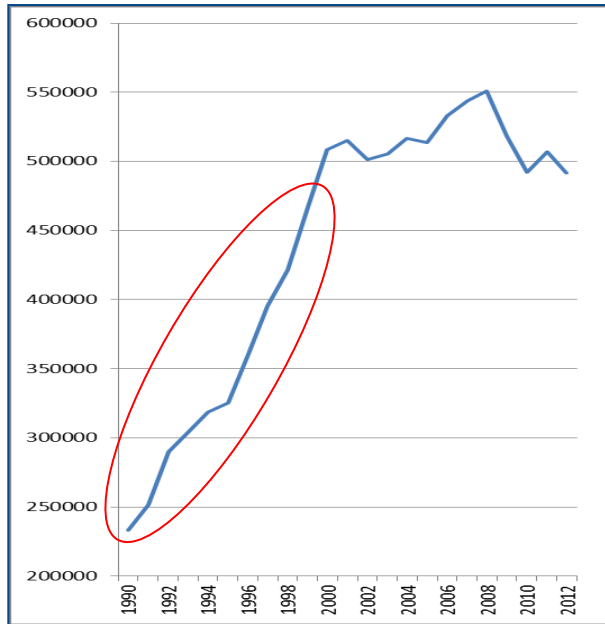


CHALLENGES

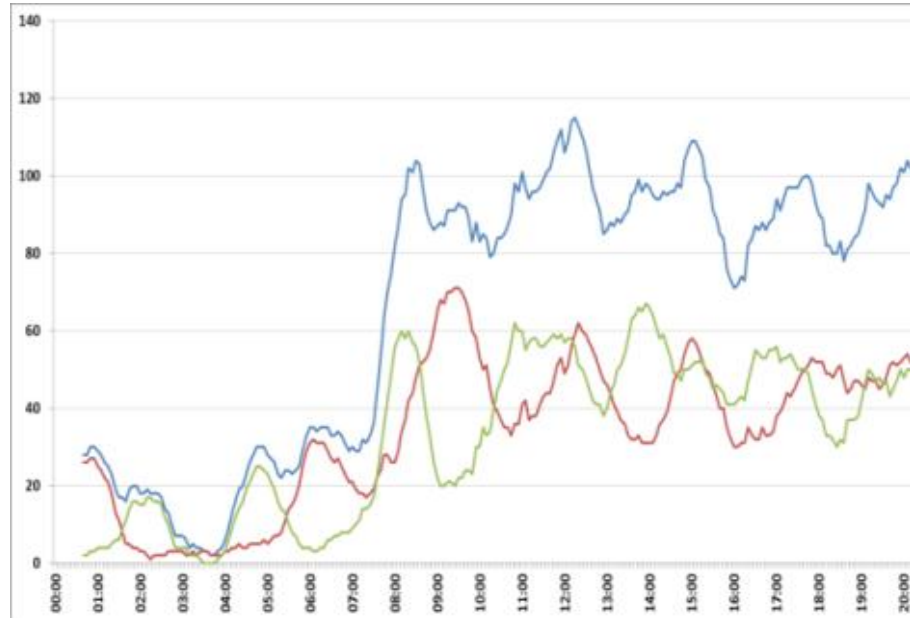




Support new Air France's Hub strategy



Strong and fast growth of the traffic between 1990-2000



Pressure at peak times

Inbound : 1 aircraft / 50 s during peak hour

Max : 72 a/h (Traffic load > 80 a/h)

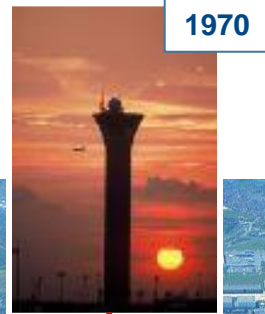
Outbound : 1 aircraft / 50 s during peak hour

Max : 76 d/h

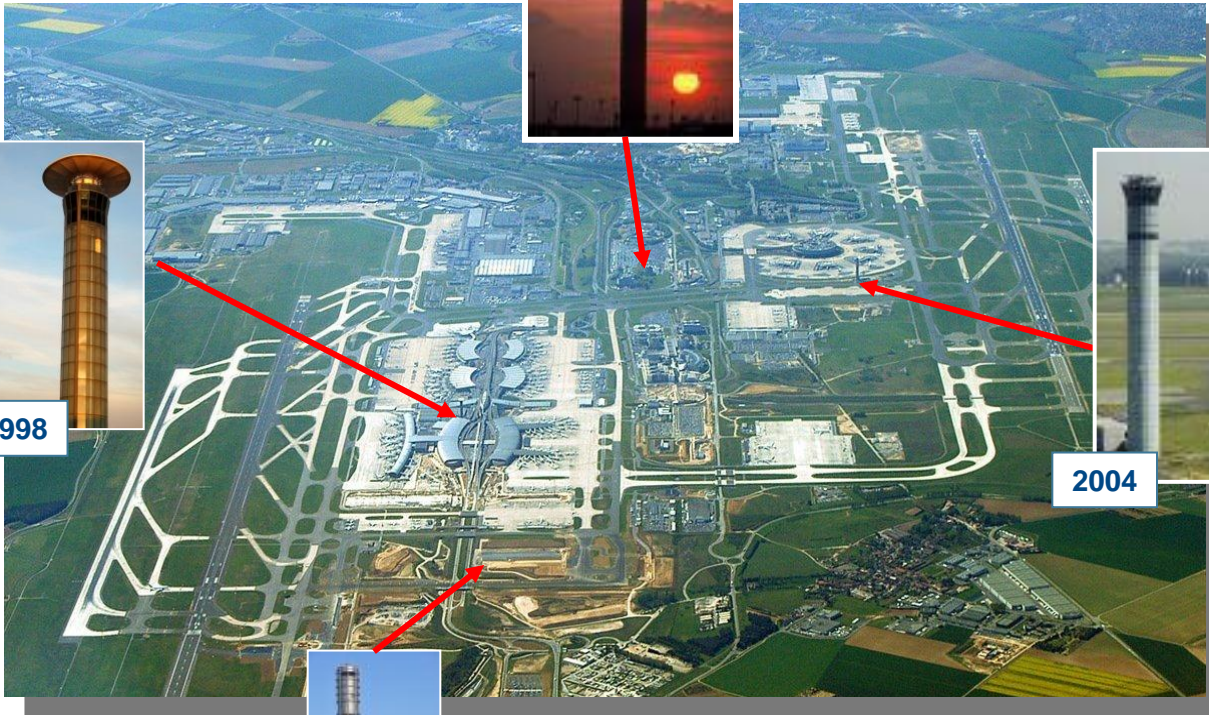


CHALLENGES

And manage the airport's growth



1970



1998



2004



2008

Ranking

- Mvts : 2° in Europe, 11° World
- PAX: 2° in Europe, 8° in world

Surface 3200ha

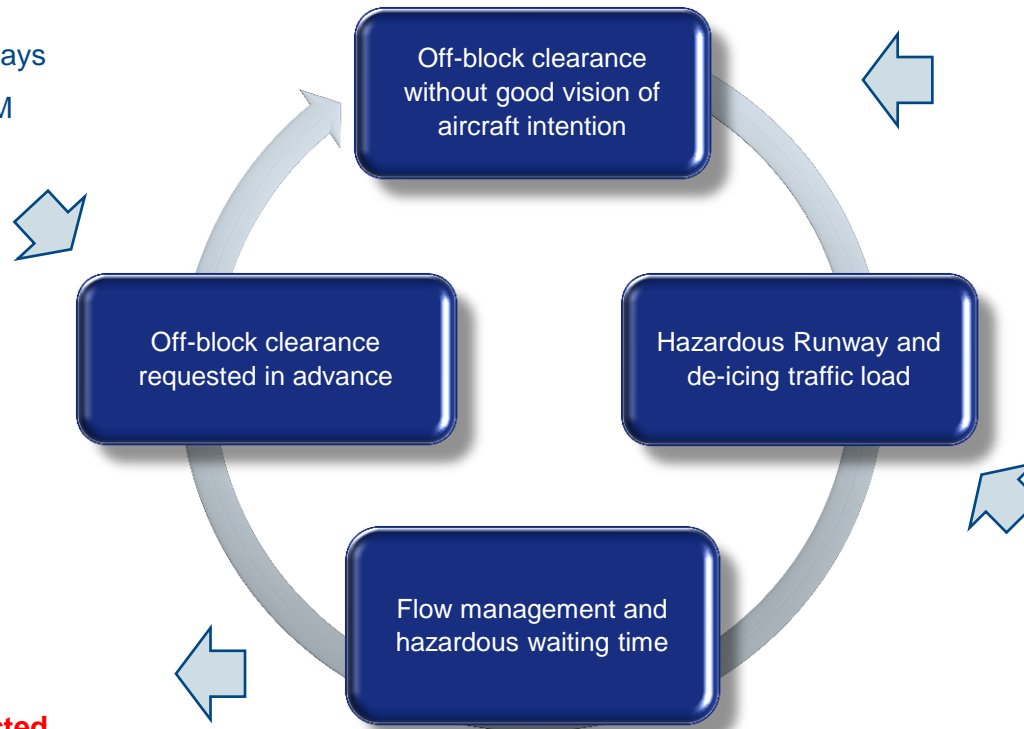
- 4 runways (2 doublets) E-W
- 2 Inner runways for takeoff (4200m)
- 2 Outer runways for landing (2700m)
- ATC capacities:
 - Inbound 71/h
 - Outbound 73/h
- 100 km Taxiways
- 210km service roads

Statistiques

- 200 airlines / year
- 471 000 mvts/year
- 600 000 mvts APP (with LFPB and satellites)
- Tower : 1500mvts/day (record 1773 mvts)
- Approach : 1750mvts/day (record 2091 mvts)
- Record : 127 mvts/hour
- 60 millions of passengers

Some limitations appears / Use case 1 : Operations during nominal day at peak period

- Difficulties to anticipate on delays
- Pilots' low confidence in ATFM

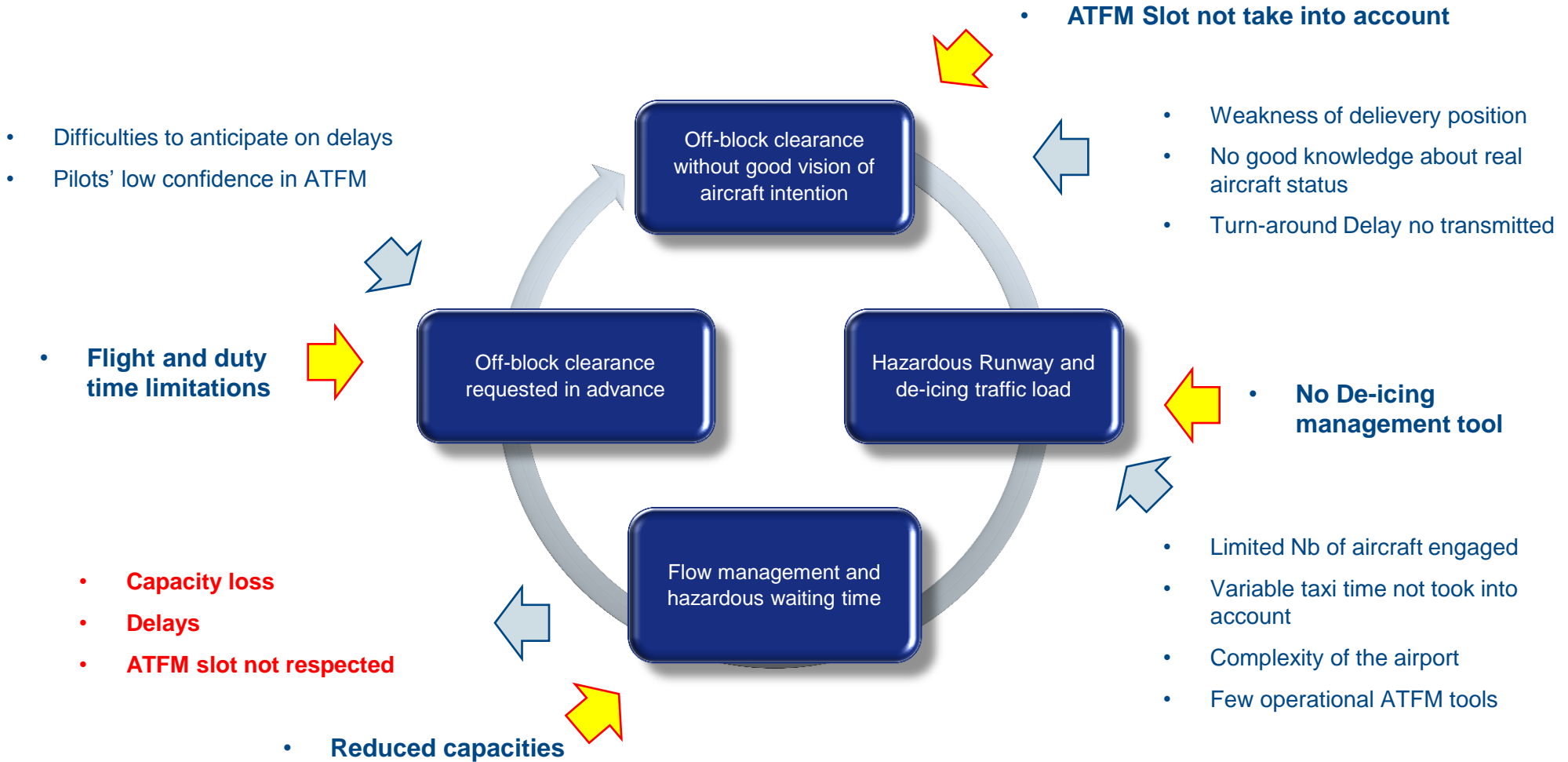


- **Capacity loss**
- **Delays**
- **ATFM slot not respected**

- Weakness of delievery position
- No good knowledge about real aircraft status
- Turn-around Delay no transmitted

- Limited Nb of aircraft engaged
- Variable taxi time not took into account
- Complexity of the airport
- Few operational ATFM tools

Some limitations appears / Use case 2 : Operations under adverse conditions





Example : Disruption during Adverse conditions

Snow event Winter 2003 (2 days)

- (hot) Cancellation : 25%
- Delays : +2h/flight (average)
- +5 000 passengers in terminals
- +5 000 passengers in hotels
- 5 days for the recovery phase



2004 The 3 main stakeholders DSN A, Aéroports De Paris, and Air France decide to launch the CDM@CDG programme

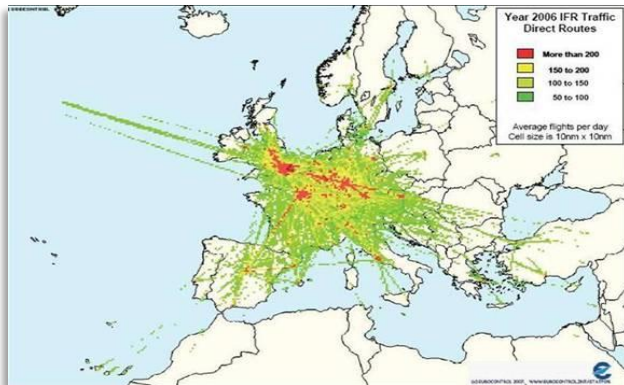
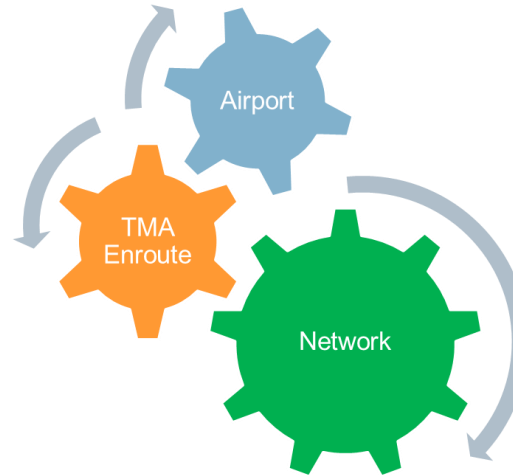


French MET Office joins the Program as an important Partner



CDM@CDG Issues

Improve the global performance of Paris CDG
in nominal situations and adverse conditions

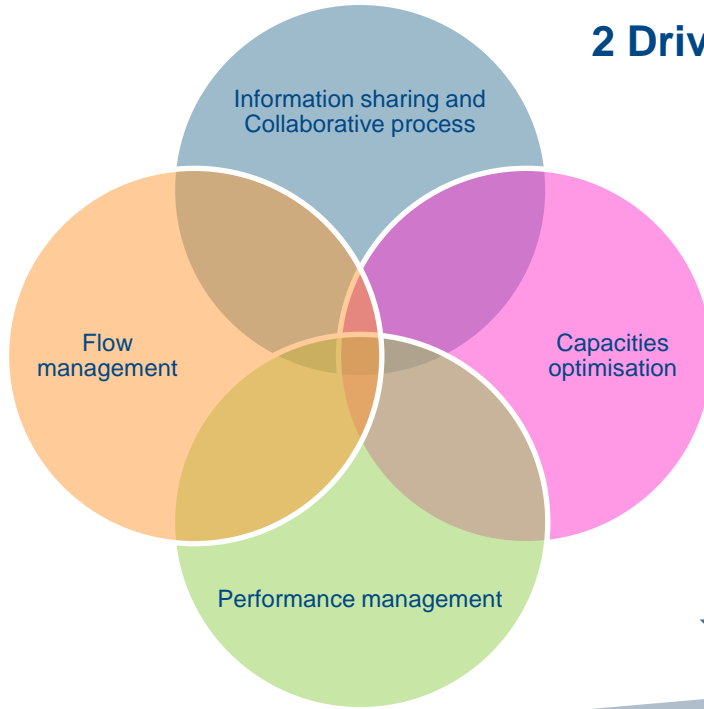


Better integrate the global performance
of the European ATM Network

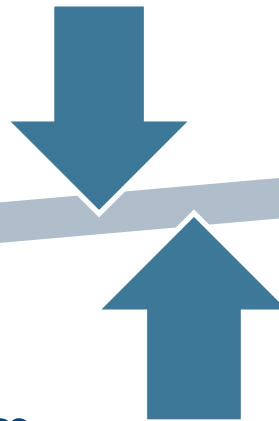


CHALLENGES

2 Drivers for One ambition



CDM@CDG2010
(Local)



CDM program
(Network)





CDM@CDG Objectives

- Commissioning EUROCONTROL A-CDM concept
 - Improving airside operations
 - Allowing each CDM Partner to optimise their decisions based on shared, accurate and timely information
 - Providing to the Airport CDM Partners adapted procedures, processes and tools
- Improve common situational awareness amongst airport partners
- Improve Predictability , Regularity, and Punctuality
- Keep high level of safety
- Optimise resources use
- Limit the environmental impact of airport operations
- Better respect ATFM departure slot
- Performance management
- Culture change !



CDM@CDG PROGRAM



2007 A first organization **project oriented** for implementing the **CDM@CDG 2010**

Strategic Program board & Steering committee – Directorate level
(4 times a year)



CDM Program Team

CDM Program Managers

Europe
(SESAR, Network, PRU)

Working Group
(Tools & KPI definitions)

Operations
(Processus & Performance)



2011 A second organization Process oriented to disseminate the CDM

Strategic Program board – Directorate level



(2 times a year)

Steering committee – Operational Manager



(4 times a year, performance driven)

Operational and Technical Teams

CDM Program Managers

Europe
(SESAR, Network, PRU)

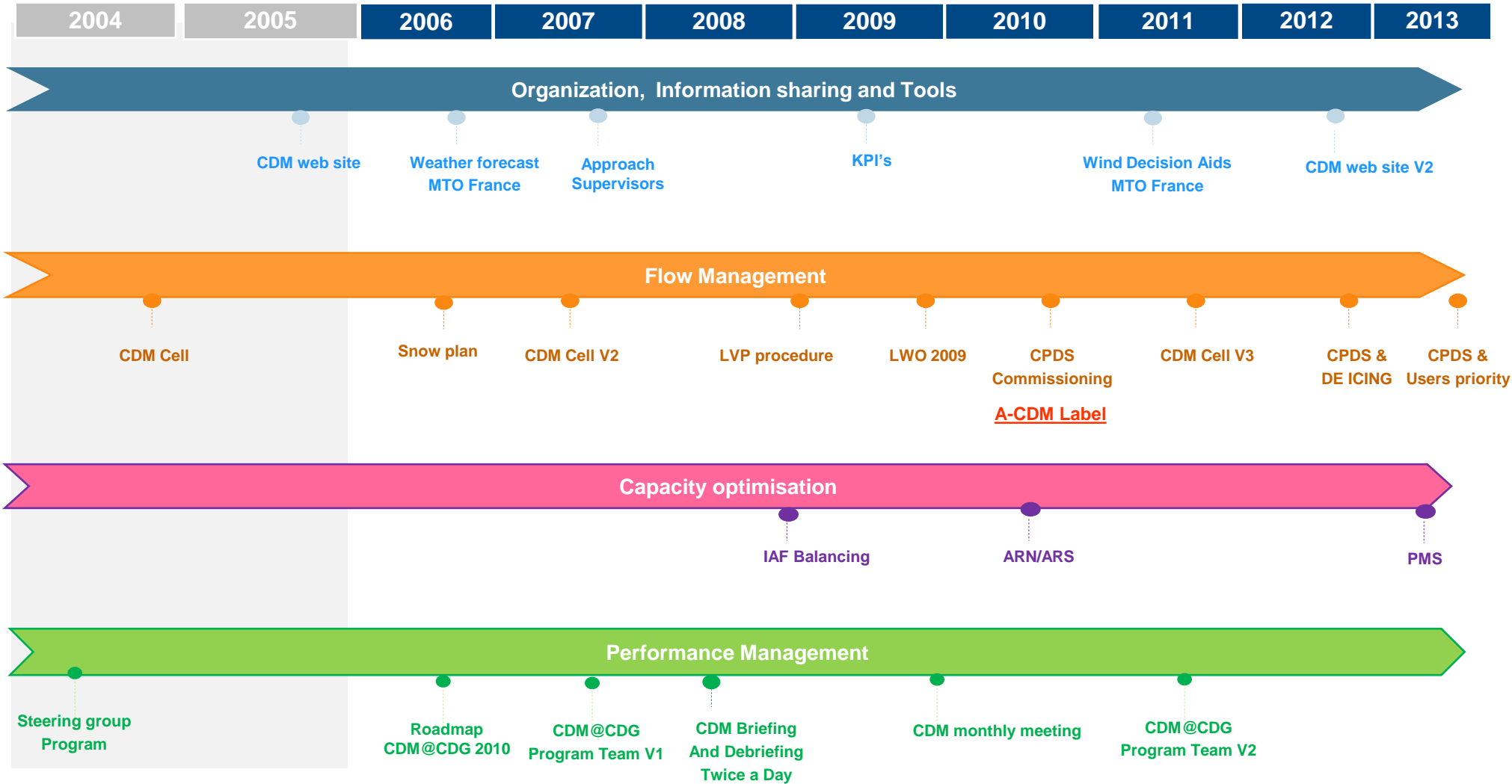
Working Group
(Tools & KPI definitions)

Operations
(Processus & Performance)



CDM@CDG PROGRAM / WORK BREAKDOWN STRUCTURE

Activities extract





ORGANIZATION, INFORMATION SHARING AND TOOLS

- Weather Forecast Tools suite
- CDM Web site
- KPI
- Human Resources
- Task Forces



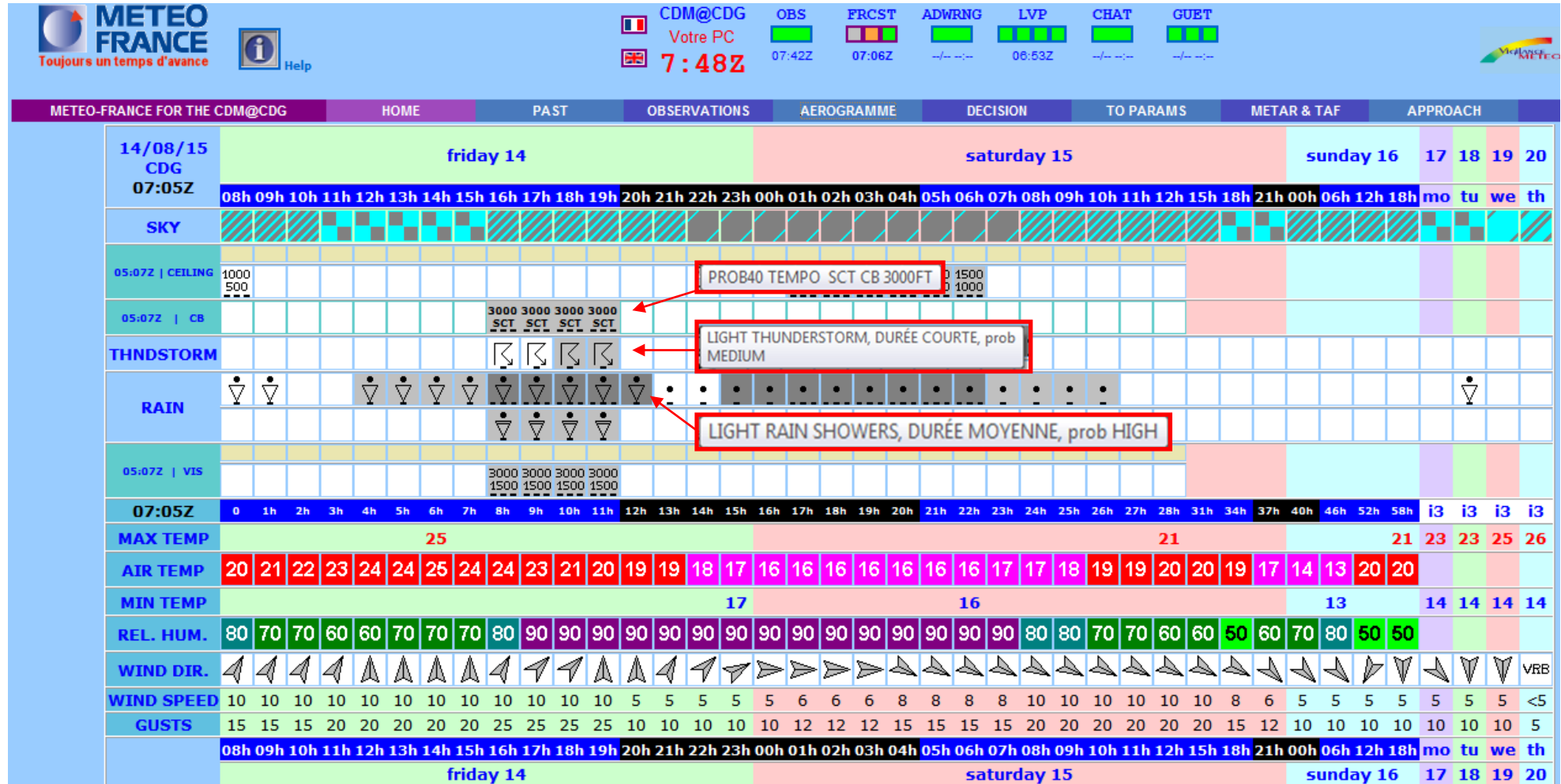


Weather Forecast Tools suite (1/3) : WEATHER OBSERVATIONS (Real Time)

ROISSY CDG (108m) - Observations for Friday august 14th 2015 at 07:12Z (09:12 LT)										
Current weather		Recent rain shower								
Ground state		Damp ground								
VISIBILITY and SKY										
Visibility		Nebulosity			Cloud layers					
10km		7/8			2/8 CU 660ft		7/8 SC 760ft		2/8 AC 10000ft	
TEMPERATURE, HUMIDITY and RAIN										
T Air (sheltered)		Td (Dew point)		Humidity		T +10cm		T ground	T-10cm	Precipitations 6mn
18.8 °C		16.4 °C		86 %		19.7 °C		21.0 °C	22.3 °C	0.0mm
WIND										
average over 10 minutes			average over 2 minutes			maximum gust				
09	190°/8kt (14km/h)			200°/8kt (14km/h)			10kt (18km/h)			27
08	210°/8kt (14km/h)			230°/8kt (14km/h)			10kt (18km/h)			26
09	200°/8kt (14km/h)			200°/8kt (14km/h)			14kt (25km/h)			
08	230°/10kt (18km/h)			230°/12kt (22km/h)			14kt (25km/h)			
PRESSURE										
Sea level pressure		1009.2 hPa			QNH			1009 hPa		POM
										> 10km
HBN		RVR						HBN		
1100ft		09L	> 2000m	MED	> 2000m	27R	> 2000m	27	930ft	
		09R	> 2000m	MED	> 2000m	27L	> 2000m			
		08L	> 2000m	MED	> 2000m	26R	> 2000m			
1000ft		08R	> 2000m	MED	> 2000m	26L	> 2000m	26	930ft	

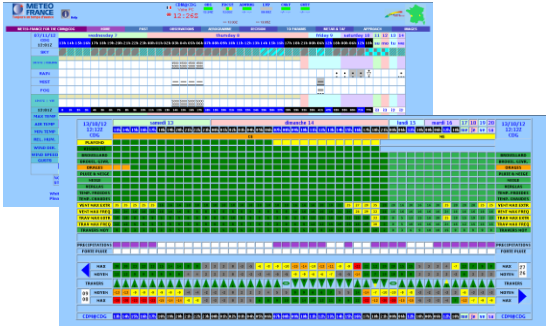


Weather Forecast Tools suite (2/3) : AEROGRAMME (forecast)

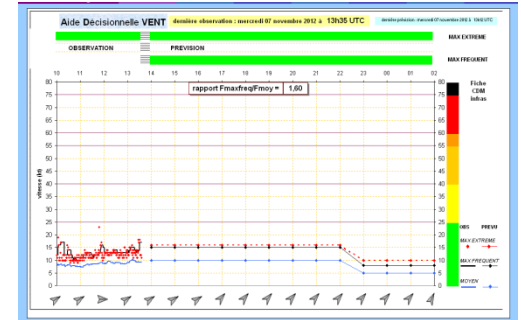


Weather Forecast Tools suite (3/3) : WEATHER OBSERVATIONS (Real Time)

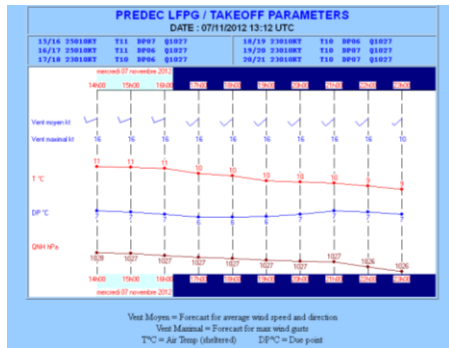
⇐ AEROGRAMME & DASHBOARD



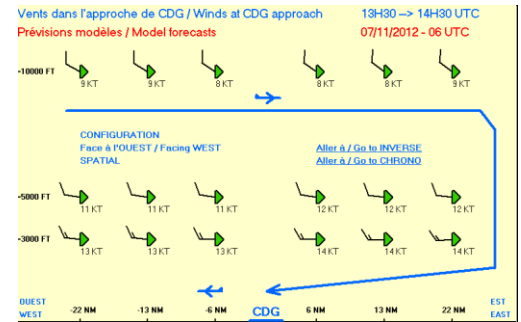
Wind Decision Aids : AD VENT ⇐



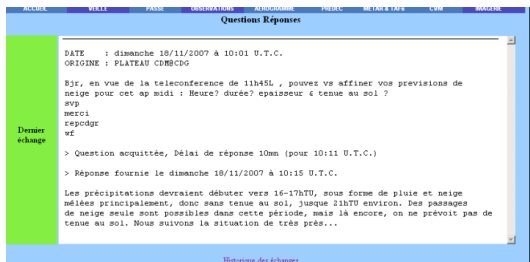
⇐ Graphic Take-off parameters (PREDEC)



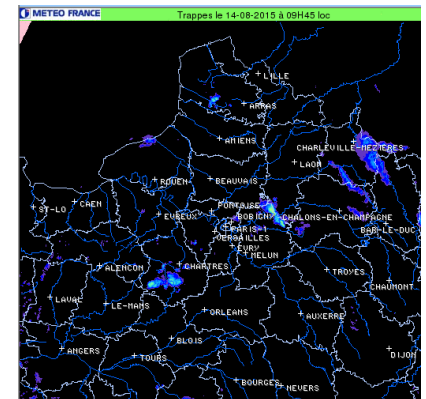
Wind in altitude (> 10000ft) ⇐



⇐ Chat METEO : questions & answers publication

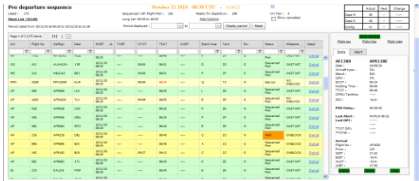


Radar display ⇐



CDM WEB SITE

C-PDS



Real time KPI & Dashboard



•Traffic load; Taxitime

•Stand occupation; De-icing; ...

Daily Debriefing

17/05/2010	Prévision 19 H 30
Participants	CA REP CCO
Compte-rendu	SOUTHERN TWIN RUNWAYS WILL BE CLOSED FROM 22H30 TO 03H00 U.T.C.HO RUNWAY CHANGE EXPECTED.
16/05/2010	Prévision 19 H 30
Participants	CA PCR CCO CCHUB
Compte-rendu	NORTHERN TWIN RUNWAYS WILL CLOSE FROM 00:30 TO 05:00 UTC. WESTBOUND CONFIGURATION EXPECTED TONIGHT AND TOMORROW MORNING.
15/05/2010	Prévision 19 H 30
Participants	DSNA, ADP, CCO et CCHUB AFR
Compte-rendu	No work on the airfield tonight. Tomorrow, low ceiling and poor visibility are forecast but nothing that could lower at this time the capacity in the morning. CDG Arrival capacity will be updated by tower supervisor tonight in case of evolution.

Airside Status

Status + tendencies
CDM Cell Status

Runway configuration
In/Out bound Capacity

Documentation

•Procédures

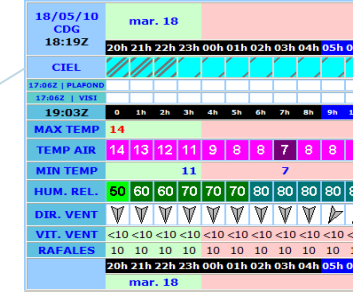
•Aeronautical Information

FAQ

- 1. CDM
- 1. Où est ce que la CDM?
- 2. Génératrice
- 1. Question question
- 2. Trouver question
- Gestion Locale des Départs (GLD)
- 1. Où est ce que la GLD?
- Publications officielles
- 1. Où trouve-t-on l'information aéronautique officielle pour CDG ?



Weather forecasts

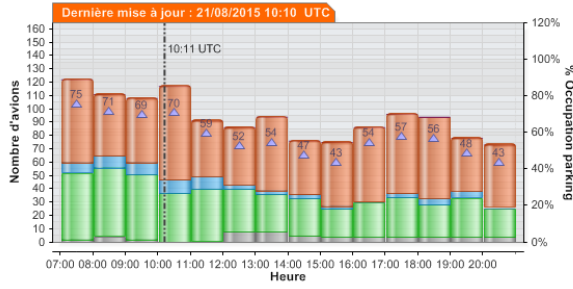
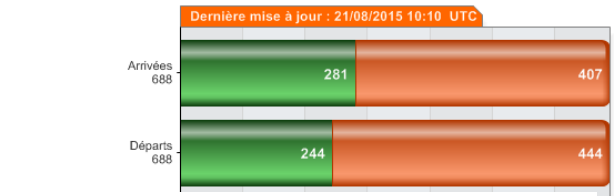
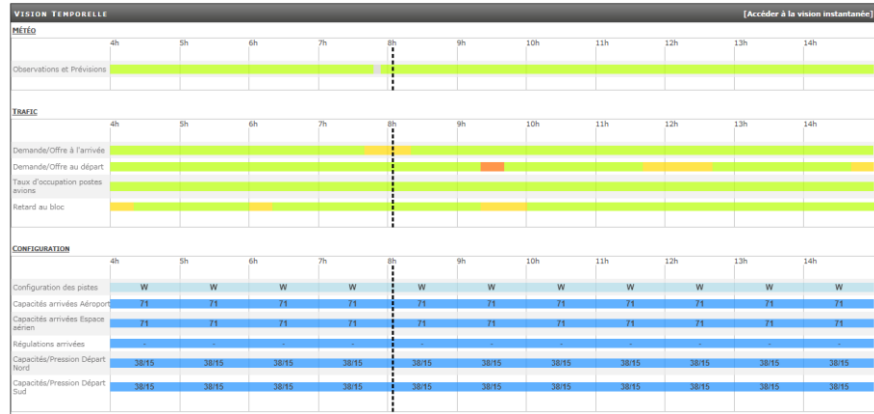


News

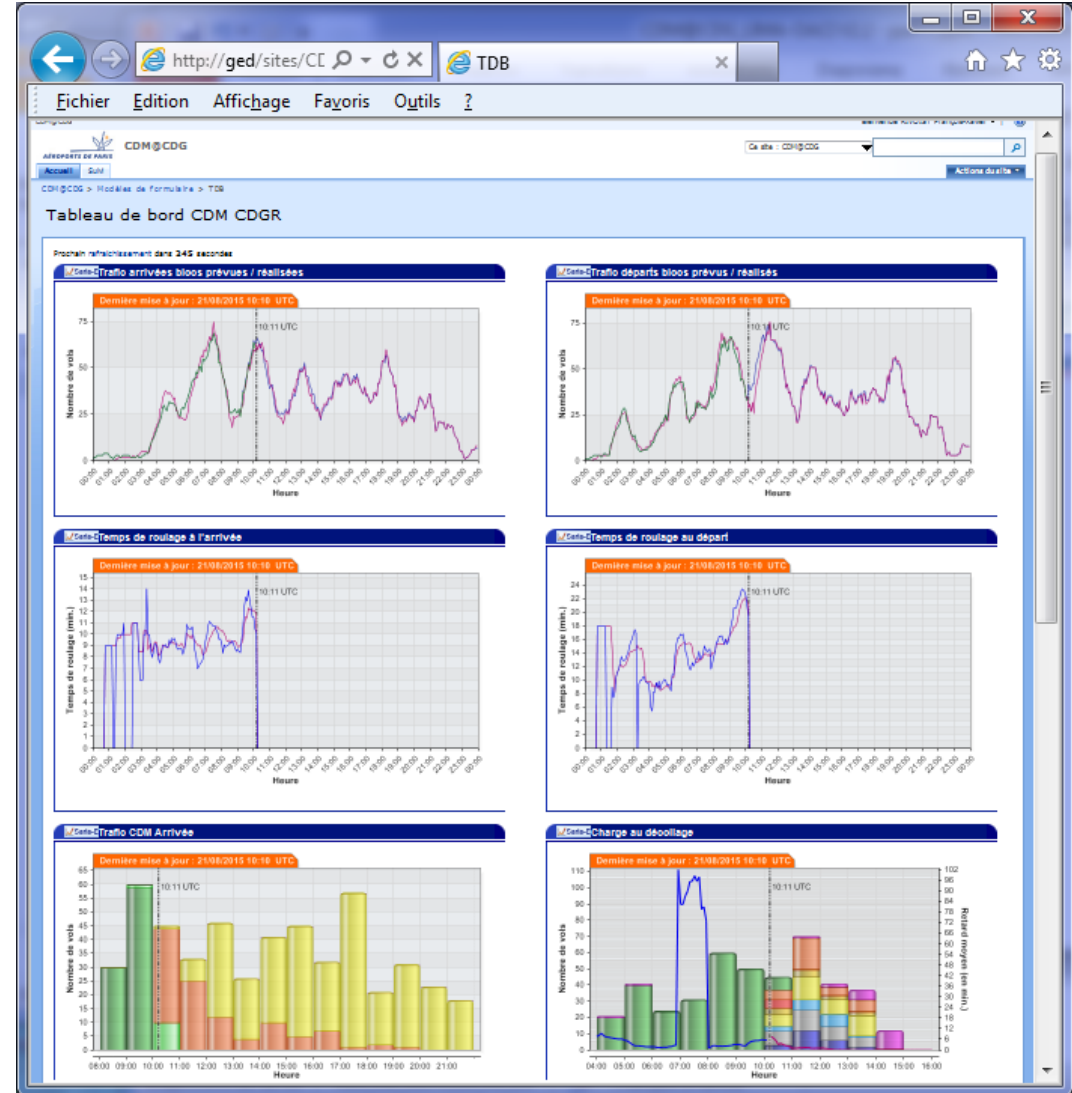
Airside Works (forecast & in progress);
Flash, procedures



DATAWAREHOUSE (1/3): KPI & Dashboard



Terminal	Retard x>=16'	% Global
	26	32% 🟡
	12	41% 🔴
	8	35% 🔴
	16	26% 🟡
	65	43% 🔴
	44	25% 🟡
	12	20% 🟡
	19	49% 🔴
CF	6	11% 🟢
Total CDG	208	31% 🟡
Total	208	31%





DATAWAREHOUSE (2/3): on Demand request

To analyse the performances, we can make some adhoc studies

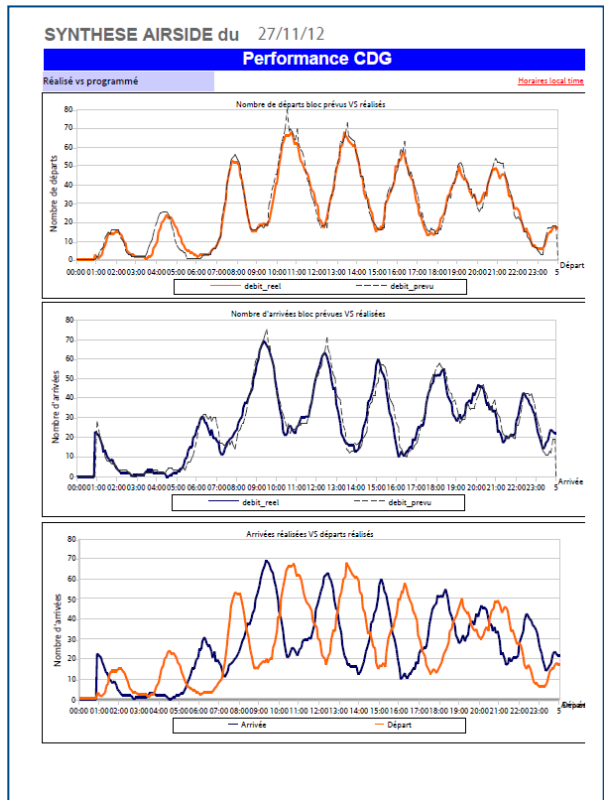
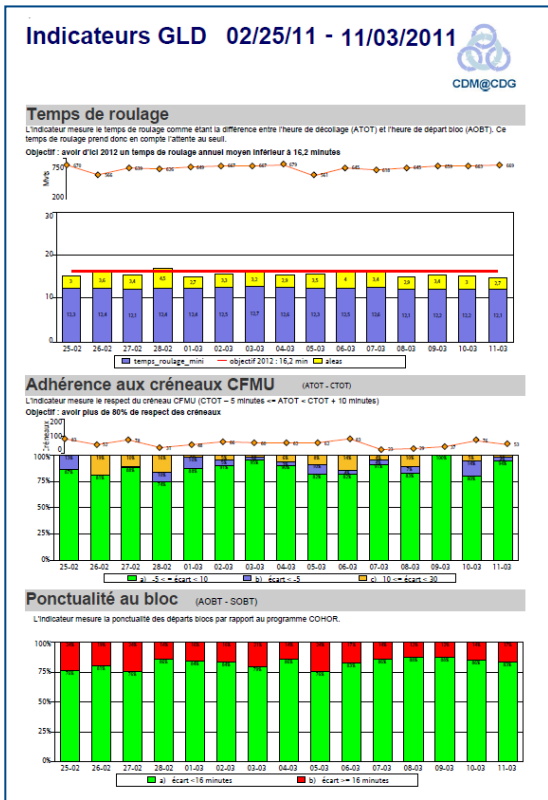
For airport internal users

The screenshot displays the SARIA-E web application interface. The main window shows a line graph titled 'Courbe des vols prévus et réalisés' (Forecasted and realized flight curve) for the date 21/08/2015. The graph plots 'Nombre de vols' (Number of flights) on the y-axis against 'Heure' (Hour) on the x-axis. Three data series are shown: 'Heure Courante' (Current hour), 'Nb Vols Prévu Réac.' (Forecasted flights - Reacted), and 'Nb Vols Prévu' (Forecasted flights). A legend indicates 'Nb Vols Constaté: 43'. Below the graph, there are filter sections for 'Mvt (1/2)' and 'Plateforme (1/2)'. The 'Mvt' filter includes 'Arrivée' and 'Départ', while the 'Plateforme' filter includes 'CDG' and 'ORY'. To the right, a detailed filter menu is visible, allowing users to refine data by various criteria such as 'Provenance / Destination', 'Type de mouvement', 'Alliance / Compagnie', 'Aire aéronautique', 'Type avion', 'Type poste de stationnement', and 'Type piste / Caractère de piste'. A yellow callout box points to this filter area with the text 'For airport internal users'.



DATAWAREHOUSE (3/3): Synthesis broadcast

Daily synthesis are sent by email to stakeholders



Synthèse trafic au 02/12/2012

	Arrivées				Départs				%								
	Nombre de vol	Temps de roulage	Somme Retard au bloc	Retard au bloc par vol	Nombre de vols	Temps de roulage	Somme retard aéroport (local)	Retard local moyen par vol									
Sam 03/11	585	0,6	7 073	12,1	591	14,9	320	38	5,5	6%	268	34	7,0	0%	43	35,3%	96%
Dim 04/11	654	0,6	8 368	14,3	658	15,4	457	48	9,5	7%	402	36	12,8	5%	45	82,2%	96%
Lun 05/11	908	0,9	9 908	11,8	899	15,1	377	42	9	6%	301	31	0,7	5%	38	100,0%	100%
Mar 06/11	655	0,6	6 349	8,2	648	15,3	443	44	10,1	7%	145	22	0,6	3%	29	99,7%	100%
Mer 07/11	605	0,4	3 755	6,2	607	15,5	352	35	10,1	5%	170	21	8,1	3%	29	93,1%	100%
Jeu 08/11	681	0,4	6 227	7,7	682	14,5	314	35	9	5%	211	25	8,4	4%	27	81,2%	100%
Ven 09/11	686	0,8	8 472	12,3	701	16,1	2 338	115	20,3	16%	347	31	11,2	4%	30	77,8%	29%
Sam 10/11	673	0,6	4 430	7,7	676	14,8	178	24	7,4	4%	181	28	6,5	5%	34	88,2%	100%
Dim 11/11	640	0,7	5 802	9,2	644	15,2	169	22	7,7	3%	103	18	5,7	3%	25	76,0%	100%
Lun 12/11	672	0,7	6 894	10	641	16,9	2 170	90	24,1	14%	126	16	7,9	2%	18	94,4%	100%
Mar 13/11	665	0,5	3 813	5,8	650	16,4	338	36	9,4	6%	177	26	6,8	4%	32	93,5%	10%
Mer 14/11	631	0,8	4 545	7,2	649	17,8	1 992	110	17,2	16%	598	51	11,7	8%	57	75,4%	0%
Jeu 15/11	688	0,4	6 652	9,7	684	15,9	344	35	9,5	5%	1 035	60	17,3	9%	67	88,1%	0%
Ven 16/11	684	11,1	12 453	18,2	689	22,9	4 664	184	26,3	26%	662	43	15,9	6%	47	74,9%	0%
Sam 17/11	591	10,8	9 972	16	556	20,5	2 034	103	18,7	18%	276	18	16,3	3%	20	79,6%	7%
Dim 18/11	617	0,3	4 558	7,4	627	15,6	289	33	8,8	5%	119	23	5,2	4%	20	88,8%	20%
Lun 19/11	660	0,5	4 985	7,7	640	15,1	345	37	9,3	6%	590	44	13,4	7%	45	77,3%	41%
Mar 20/11	641	0,4	3 443	5,7	637	17,3	659	60	11	9%	486	35	13,9	5%	45	90,0%	44%
Mer 21/11	607	0,3	3 235	4,9	607	15,5	228	23	9,8	4%	231	24	9,8	4%	33	90,4%	75%
Jeu 22/11	671	10,4	7 261	10,8	665	18,9	1 154	84	13,7	13%	289	24	12	4%	34	79,4%	43%
Ven 23/11	668	0,9	3 998	6	684	15,8	374	39	10,4	5%	117	22	5,3	3%	29	95,4%	94%
Sam 24/11	597	0,2	3 977	7,1	582	15,9	238	30	7,9	5%	195	13	14,2	2%	18	83,3%	7%
Dim 25/11	612	0,6	5 156	8,4	620	15,1	242	31	7,4	5%	473	48	10,3	7%	55	92,1%	100%
Lun 26/11	646	0,4	5 226	8,1	628	15,3	193	23	8,4	4%	147	24	8,1	4%	30	88,7%	100%
Mar 27/11	651	0,6	6 173	9,5	647	15,1	189	26	7,3	4%	98	11	7,8	2%	18	94,4%	100%
Mer 28/11	654	0,1	5 204	8	651	16	395	36	10,1	6%	195	16	10,3	3%	21	90,5%	16%
Jeu 29/11	665	0,6	5 021	7,6	676	15,2	332	38	8,7	6%	299	20	9,3	4%	37	94,8%	100%
Ven 30/11	685	0,9	7 900	11,7	688	18	1 723	106	16,3	15%	270	21	12,9	3%	27	77,6%	100%
Sam 01/12	554	10,3	7 908	14,3	558	17	405	42	9,6	7%	378	24	15,8	4%	30	80,0%	100%
Dim 02/12	612	10,1	7 051	11,5	620	17	262	33	7,9	5%	123	19	6,5	3%	20	86,0%	100%

HUMAN RESOURCES

➤ New roles

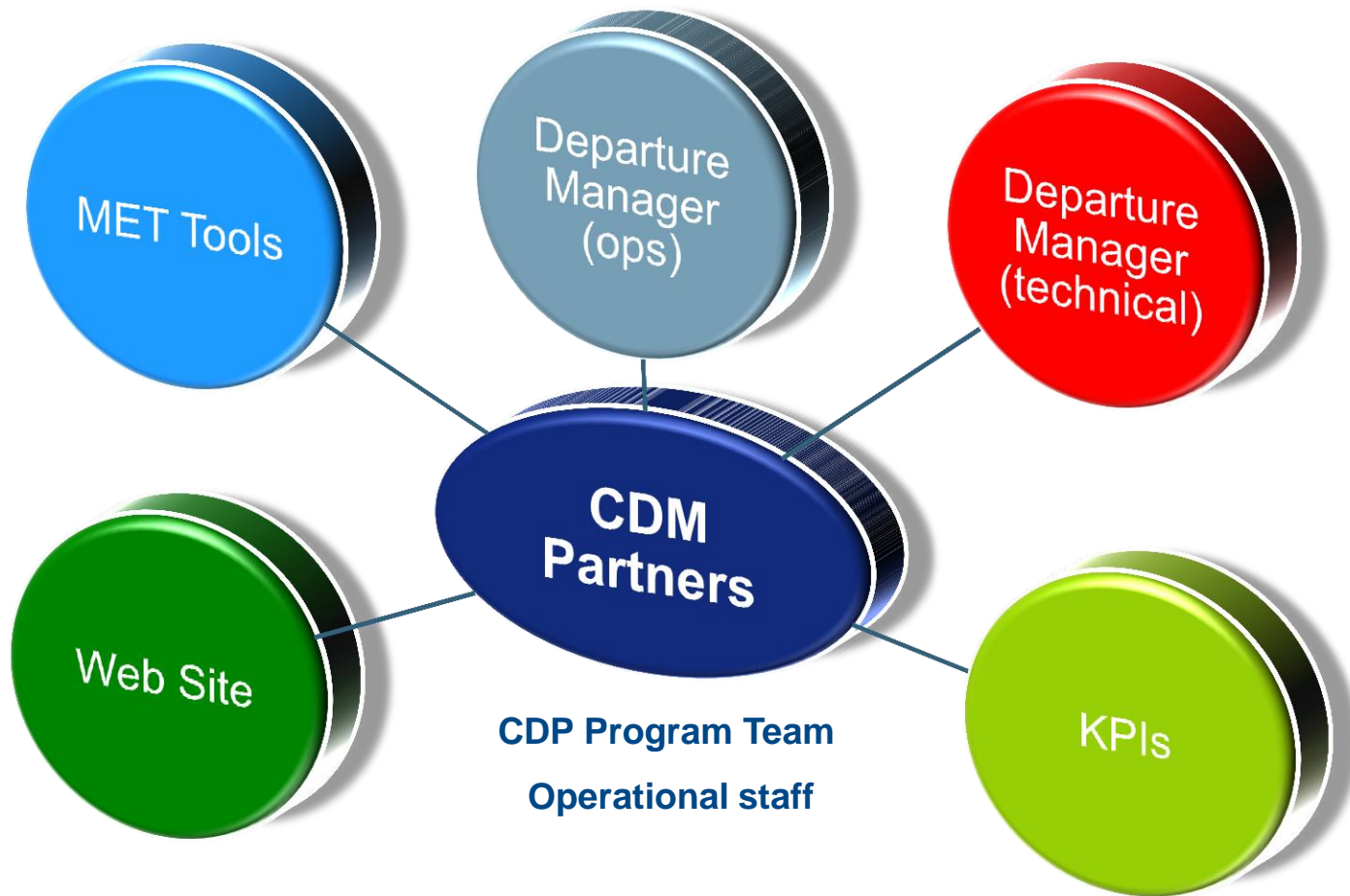
- ATC : Approach Supervisor (App room, Operational Expert, CDM duty Manager)
- Airport :
 - COT : Technical and Operational Manager (CDM Cell)
 - RPE : Operation manager (CPDS) & De-icing Dispatcher (CPDS & De-icing)

➤ Common training course

- Human Factor : adverse conditions & CDM
- Winter Briefing : ATC / Airport / Airlines



LOCAL TASK FORCES





EUROPEAN WORKS

- Harmonization A-CDM
- Operations
 - MASS DIV (Massive Diversion)
 - EIE (Enhanced Information Exchange)
- Performance PRU/PRB
- R&D : SESAR JU





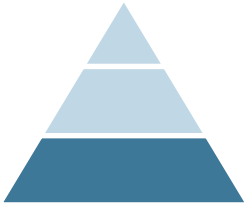
FLOW MANAGEMENT

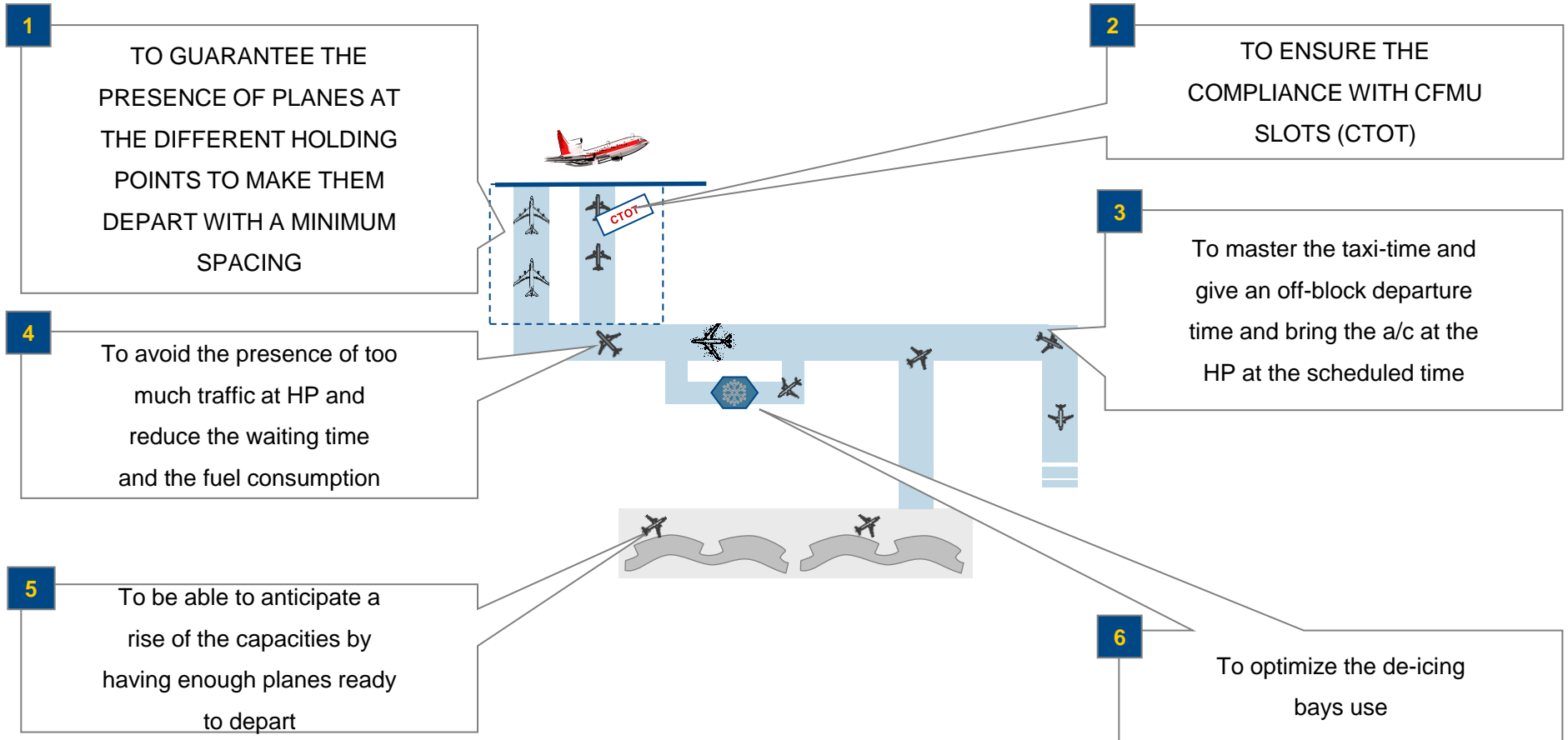
- ❑ Collaborative Pre Departure Sequence
- ❑ Adverse conditions

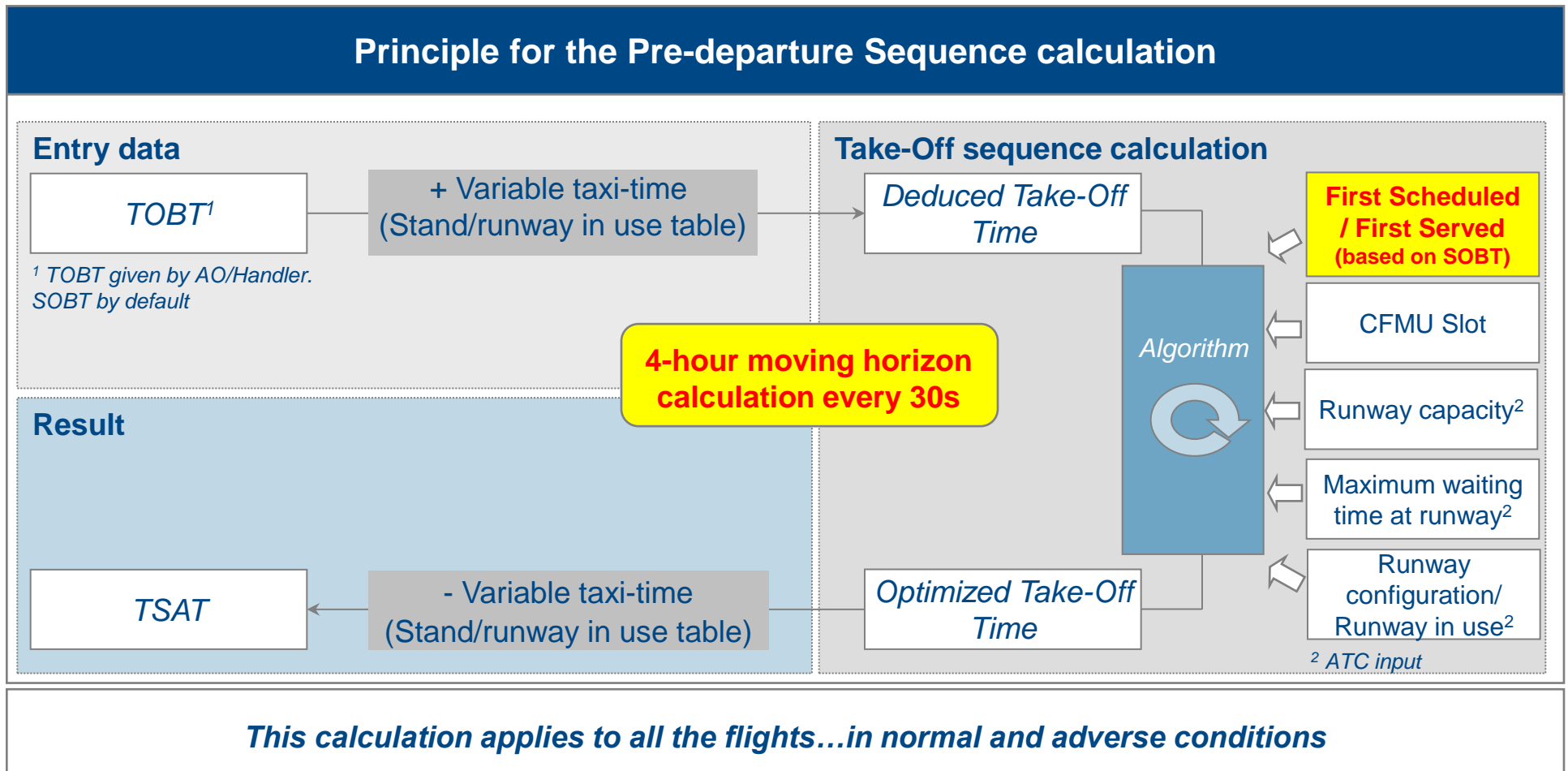


Collaborative Pre Departure Sequence

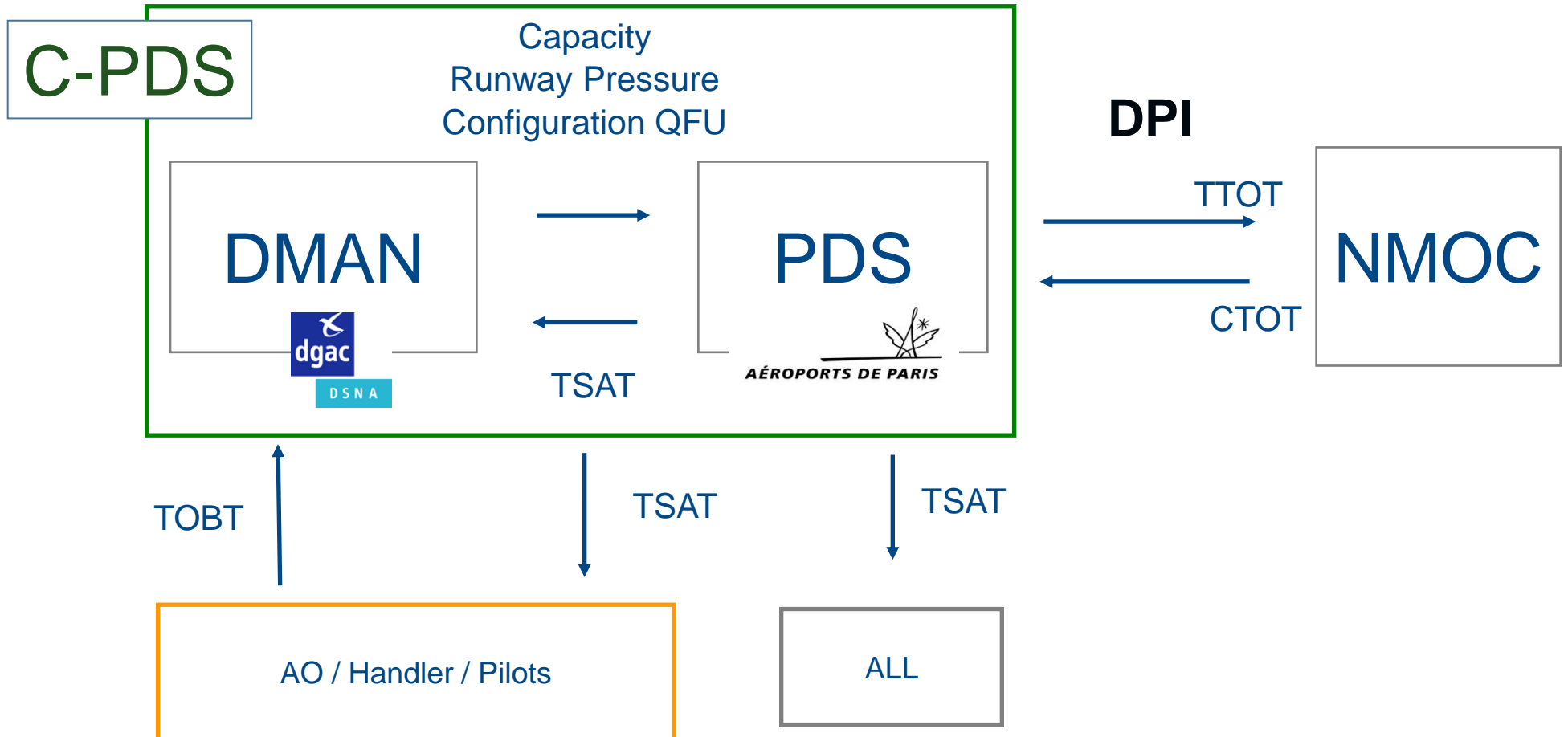
Start-up at TSAT 10:00 !



CPDS issues


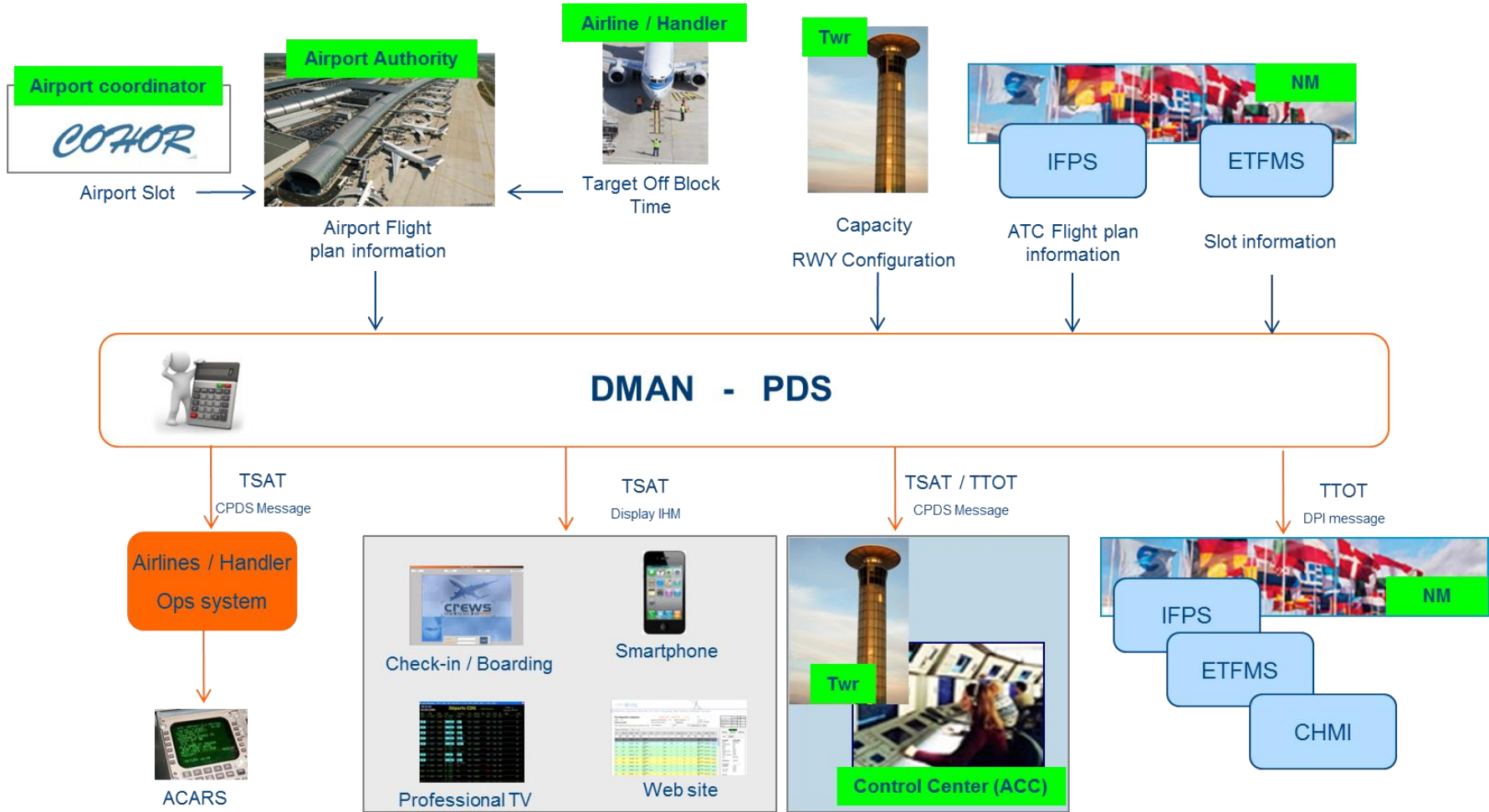
CPDS : Principles


CPDS : Principles





CPDS : Details

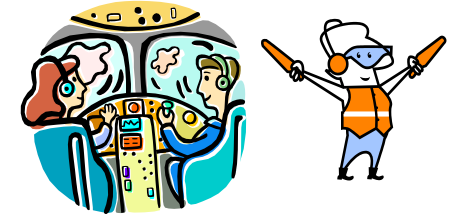


CPDS : Actors



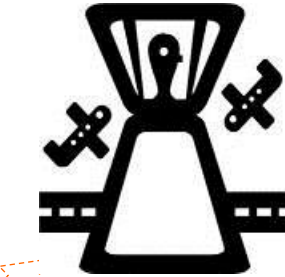
AIRLINES
HANDLERS

TOWER SUPERVISOR



TSAT
TOBT

RPE PCR



DMAN

START UP
CLEARANCE
TOBT - 10mn

PUSH BACK
TSAT

SOBT



CAPA
PRESSURE

PDS

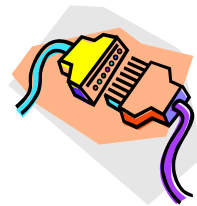
DELIVERY POSITION

APRON or GROUND POSITION



COHOR

CTOT
TTOT

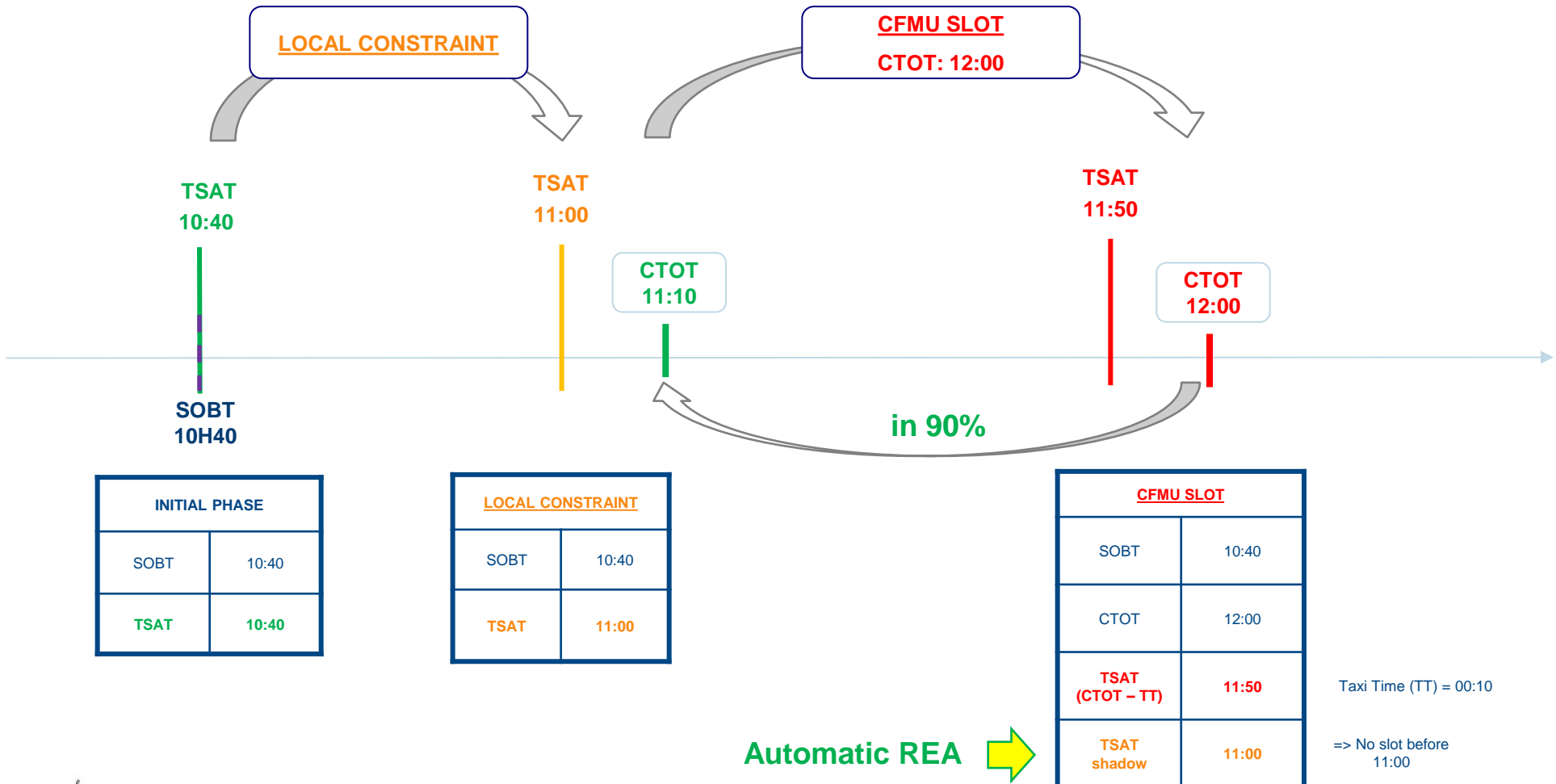


DMAN



EUROCONTROL

CFMU

CPDS Example




CPDS : Pre Departure Sequencer HMI

This view is available on the website and on the airport network (handlers, users...)

Pre departure sequence mai 01 2011 - 16:13 UTC - 18:13 LT

Listed : 163 Sequenced with Flight Plan : 171 Ready for departure : 12 On Taxi : 10

Short List +03:00 Long List -00:05 to 18:00 Add Column Show cancelled

Period Listed from 05/01/2011 at 16:08 to 05/01/2011 at 19:13 Period displayed : [] to [] Display period Reset

AO	Flight No	CallSign	Dest	SOBT	EOBT	TOBT	TSAT	AOBT	CTOT	TTOT	ATOT	Stand	Ar	Term	Rw	Status	Milestone	Detail
XLF	756		SVQ	05/01/... 17:30	--:--	21:30	--:--	--:--	--:--	--:--	--:--	Q	T3	N	Seque... Plan	ONBL...	Detail	
AF	1080	AFR10...	LHR	05/01/... 16:05	16:05	16:10	16:10	16:08	--:--	16:19	--:--	B	2B	S	Seque... Plan	OFFB...	Detail	
SK	1560	SAS15...	CPH	05/01/... 16:10	16:10	--:--	16:10	16:03	--:--	16:13	--:--	Y	1	N	Seque... Plan	OFFB...	Detail	
SU	256		VO	05/01/... 16:10	16:10	--:--	16:10	--:--	--:--	16:30	--:--	E	2E	N	Seque... Plan	OFFB...	Detail	
LS	316		BA	05/01/... 16:10	16:10	--:--	16:10	--:--	--:--	16:25	--:--	Q	T3	N	Seque... Plan	OKST...	Detail	
WW	5252	BMI30A	EMA	05/01/... 16:10	16:10	--:--	16:10	--:--	--:--	16:21	--:--	T	1	N	Seque... Plan	OFFB...	Detail	
AF	2112	AFR21...	LIN	05/01/... 16:15	16:15	--:--	16:15	--:--	--:--	16:25	--:--	E	2F	S	Seque... Plan	OKST...	Detail	
AF	7708	AF708...	NCE	05/01/... 16:15	16:15	16:25	16:15	--:--	--:--	16:25	--:--	F	2F	S	Seque... Plan	OKST...	Detail	
AF	2482	AFR24...	PRG	05/01/... 16:15	16:15	--:--	16:15	--:--	--:--	16:28	--:--	D	2D	N	Seque... Plan	OKST...	Detail	
AF	2226	AFR02...	VCE	05/01/... 16:15	16:15	--:--	16:15	--:--	--:--	16:15	--:--	2F	S	S	Seque... Plan	OKST...	Detail	
LG	8020	LGL8020	LUX	05/01/... 16:15	16:15	--:--	16:15	--:--	--:--	16:15	--:--	2D	N	N	Seque... Plan	OKST...	Detail	
VY	8246	VLG8246	ALC	05/01/... 16:15	16:15	--:--	16:15	--:--	--:--	16:15	--:--	T3	S	S	Alert NOCLR	ONBL...	Detail	
AF	2522	AFR25...	MUC	05/01/... 16:15	16:15	16:20	16:20	--:--	--:--	16:20	--:--	2D	S	S	Seque... Plan	OKST...	Detail	

Capacity / Pressure

	Actual	Next	Change
Capa/Pressure N	38/15 (d)	--/--	--:--
Capa/Pressure S	38/15 (d)	--/--	--:--
Config	E	--	--:--

Flight information

Flight Log Flight Msg Flight Alert

Data Alert

AF2214 **AFR2214**

Date : 05/01/2011

Aircraft type : 320

Registration : FGIOV

Stand : F34

QFU : 08L

EXOT : 00:13

Holding Time : 00:03

TTOT : 16:46

CFMU Taxitime: 00:00

SID : LANV11H

PDS Delay : 00:00:00

Last Alert : -----

Last DPI : T_DPI_s

15:50

TTOT DPI: 16:45

TTOTsh : -N/A-

Arrival

Flight No : AF1739

From : VIE

SIBT : 15:40

EIBT : 15:31

ALDT : 15:22

AIBT : 15:33

SARIS DMAN CFMU

Flight identification

Commercial ID
Airline/Airport

ATC ID

Time information

SOBT / EOBT
Airport/ATC Slot

TOBT
Estimated Departure

TSAT
Target Startup Approval Time

AOBT
Actual Of Bloc Time

CTOT
CFMU Slot

TTOT
Target Take Of Time

ATOT
Actual Take Of Time

Alert / State

EXOT
Estimated Taxi Time

Holding Time
Threshold waiting time

PDS Delay
Stand waiting time

DPI information
Last DPI sent

Inbound information



CPDS : Departure Manager DMAN HM

This view is available on the delivery controller position

DHMI Discus 17:42:48

Capacité Nord 30 Sud 30 Pression Nord 5' Sud 5' Activés Nord 2 Sud 4

PVL Activés

41 Eveillés 21 Nord 20 Sud 3 En attente 2 Nord 1 Sud 09:40:17

CTM0001	EEBR NIPOR	EXEN	BMI30A	EGNX OPALE	09:57E	2	KLM1224	EHAM NURMO	09:47
AFR999A	LEBL ERIXU	09:34	BCY132L	EGEB OPALE	09:56	F	AFR206F	ESSA NURMO	09:52
AFR1300	LEMD AGOPA	09:44E	AFR1426	LIPZ LANVI	10:53	E			
AFR195D	DAAG ERIXU	09:40	BEE1252	EGHI OPALE	09:58	A			
SMX5997	LIML LANVI	09:40	AFR5960	LEBB LGL	10:00	A			
BCY5032	ESGG NURMO	09:53	BZ707NS	LFFN LGL	10:00	E			
AFR1450	EKCH NURMO	09:47	BEE1502	EGTE EVX	10:05	A			
TSC187	CYUL ATPEX	10:00	COA57	KEWR ATPEX	10:13				
KLM1228	EHAM NURMO	09:44	SWR633	LSZH BUELI	10:18				
IYE749	OYSN OKASI	09:45	BLE546P	LFLC MONOT	10:04				
BEE7032	EGEB OPALE	09:50	AFR2698	ULLI NURMO	10:05				
AFR1606	EDDL NIPOR	09:48	AAL45	KJFK EVX	10:06				
AFR1254	LDZA LANVI	09:49	RAE518	EDDN NIPOR	10:08E				
BAW305	EGLL OPALE	09:50	AFR184L	LSGG PILUL	10:06				
RAE494	EDDV NIPOR	09:50	CSA759	LKPR NIPOR	10:11				
AFR5572	LEVX LGL	09:51	AFR1590	LTBA LANVI	10:10				
AFR618K	EDDF NIPOR	09:55	BCY5040	EIDW OKASI	10:10				

2 Alertes LDAS

AF736HF AFR1532

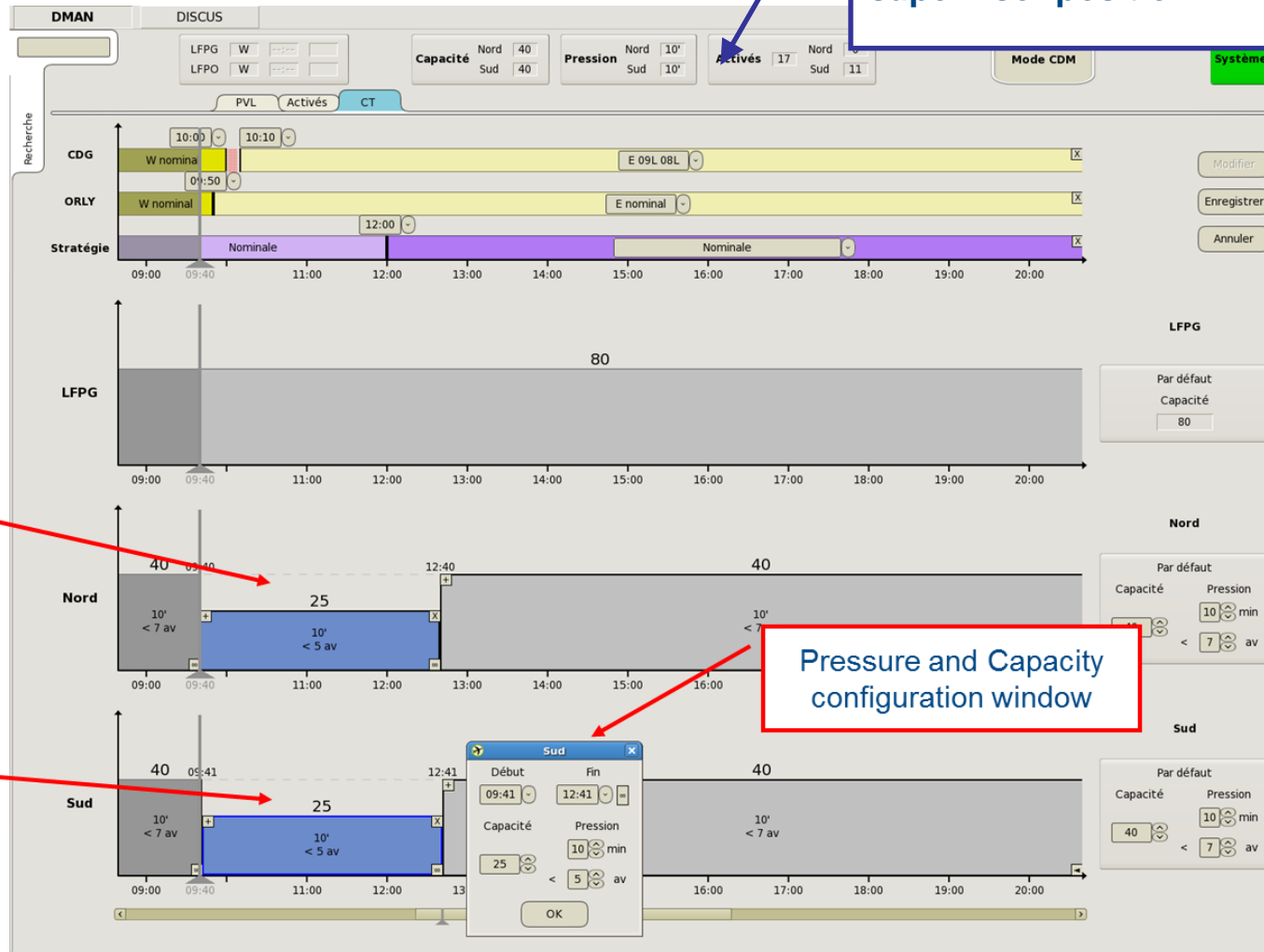
TSAT

These 2 flights are In waiting list, ready but not yet allowed to start up because of their TSAT

The flight is within TSAT tolerance, it's time to allow start up

CPDS : Departure Manager DMAN HMI / Supervisor

This view is available on the tower supervisor position



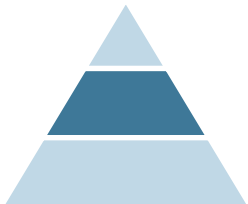
North RWY capacity

South RWY capacity

Pressure and Capacity configuration window



CPDS & DE-ICING



CPDS & DE-ICING : Overview

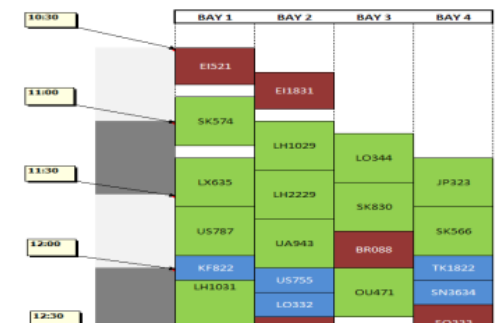
Objectives

1. Optimizing the use of deicing bays and runways
2. Improve traffic fluidity and avoid congestion at the threshold and/or at deicing bays
3. Improve take-off time predictability for the Network and slot adherence

General principle

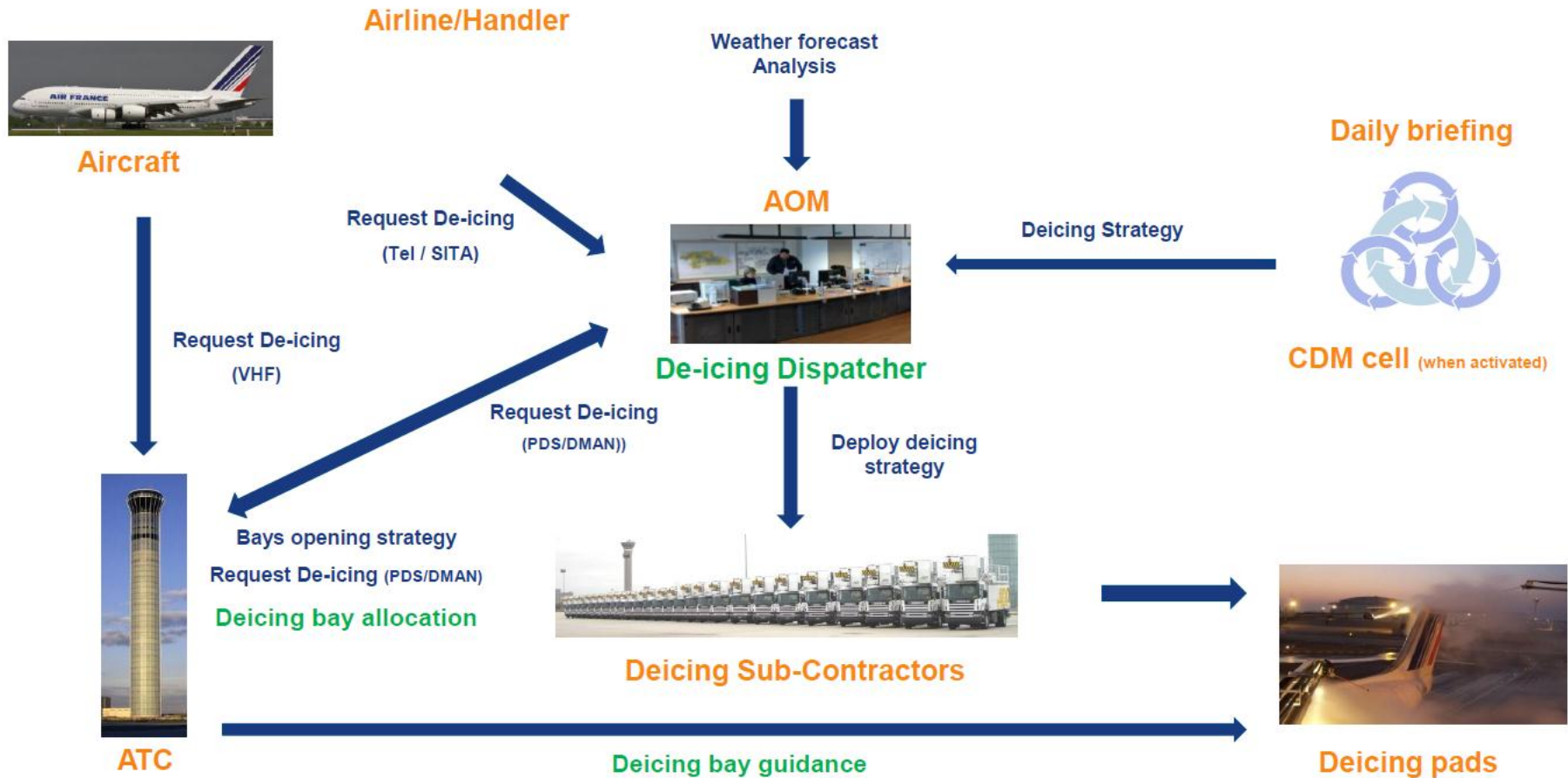
- ✓ **Take in account all constraints**
 - Airlines / Handlers (TOBT)
 - Network capacity (CFMU Slot)
 - ATC capacity
 - Deicing capacity (ADP bays, Fedex bays, on-stand deicing)

- ✓ **Separate Deicing and Runway capacities**
 - New position : Deicing Dispatcher
 - New tool : Deicing Manager
 - Automatic pre-assignment of aircraft on deicing sites



CPDS & De-icing

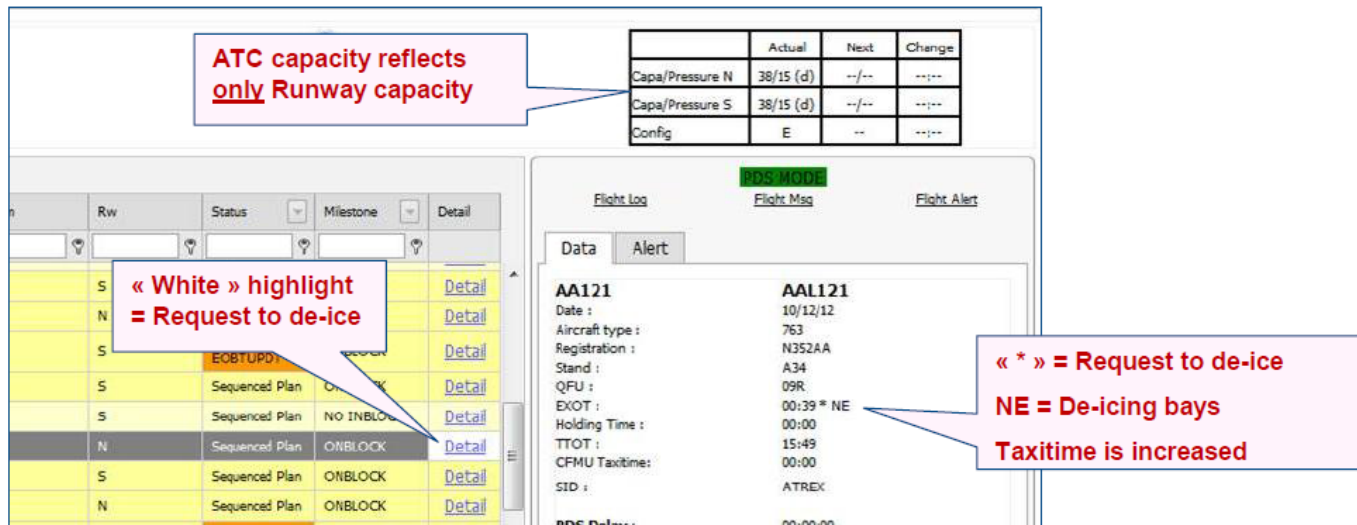
New coordination procedures



CPDS & De-icing

PDS improvements

- ✓ New Variable taxitime : Stand => De-icing pads & De-icing pads => Thresholds
- ✓ Manage capacity of deicing sites
 - New sequence to each De-icing area
 - Take into account “Max Aircrafts accepted front the holding deicing area”
- ✓ IHM evolutions (available on web site)



ATC capacity reflects only Runway capacity

	Actual	Next	Change
Capa/Pressure N	38/15 (d)	--/--	--/--
Capa/Pressure S	38/15 (d)	--/--	--/--
Config	E	--	--/--

« White » highlight = Request to de-ice

Rw	Status	Milestone	Detail
S			Detail
N			Detail
S			Detail
S	EOBTUPD		Detail
S	Sequenced Plan	ONBLOCK	Detail
S	Sequenced Plan	NO INBLOCK	Detail
N	Sequenced Plan	ONBLOCK	Detail
S	Sequenced Plan	ONBLOCK	Detail
N	Sequenced Plan	ONBLOCK	Detail

**« * » = Request to de-ice
NE = De-icing bays
Taxitime is increased**

Data	Alert
AA121	AAL121
Date :	10/12/12
Aircraft type :	763
Registration :	N352AA
Stand :	A34
QFU :	09R
EXOT :	00:39 * NE
Holding Time :	00:00
TTOT :	15:49
CFMU Taxitime :	00:00
SID :	ATREX
BDS Delay :	00:00:00



CPDS & De-icing

De-icing Manager tool (main functions)

Deicing bays activity Monitoring

Plateforme 1 baie(s) ouverte(s)	NW 1 baie(s) ouverte(s)	NE (fermé)	SE (fermé)
Debit : 0 av/h T GP : 0 min T MP : 0 min T PP : 0 min Retard : 0 min Demandes : 5 Attente moy : 10 min Nb attente : 1 av Antigrivage : 0	Debit : 0 av/h T GP : 0 min T MP : 0 min T PP : 0 min Retard : 0 min Demandes : 5 Attente moy : 10 min Nb attente : 0/2 av	Debit : 0 av/h T GP : 0 min T MP : 0 min T PP : 0 min Retard : 0 min Demandes : 5 Attente moy : 10 min Nb attente : 0	Debit : 0 av/h T GP : 0 min T MP : 0 min T PP : 0 min Retard : 0 min Demandes : 5 Attente moy : 10 min Nb attente : 0

Request the sub-contractor to open/close a bay
Indicator monitoring (throughput, ...)
Max aircrafts accepted at the holding deicing area

Flight list monitoring

Creer	Cie OACI	Cie	N° de vol	Id ATC	Immat	TSAT
						Enter date
+	AFR	AF	1114	AFR1114	FGRXF	
+	AFR	AF	5104	BCY104X	EIRJY	
+	AFR	AF	7738	AF738-HF	FGRZI	
+	AFR		418A		FGSQG	
+	AFR		10	AFR1620	FGKXM	

QU CDGDEXH
 QU CDGDEXH CDGDEXH CDGPOXH CDGDEXH CDGPOXH
 CDG53XH RSYKAF CDGKZAF
 CDGDACR RSYKWAF CDGKBAF CDGABXH RSYKIAF CDGKAAF
 RSYKQAF RSYKLAF
 CDGMOTP
 RSYKQAF 010451 029038 MAR11/DEI
 -TITLE DEI
 -COMID
 -ARCID CTM1101
 -DEAREA REMOTE
 -ADES
 -REG
 -ARCTYP
 -SOBD 110301

753
320
733

Monitor the de-icing demand (confirm/cancel)
Change de-icing site allocation
Modify De-icing Time

Monitor unknown formatted SITA messages

Estimated of De-Icing Time depending on aircraft type

Temps de traitement

Temps de traitement actuel

Type de dégivrage : Complet Type de produit : Type 1

Temps gros-porteur : 20 minutes Temps moyen porteur : 20 minutes Temps petit porteur : 20 minutes

Temps avant le début de traitement en baie : 5 minutes Temps avant le début du traitement au poste : 5 minutes

Temps après la fin du traitement en baie : 5 minutes Temps après la fin du traitement au poste : 5 minutes

Type de dégivrage : **Complet** Type de produit : **Type 1** Appliquer les valeurs par défaut

Temps gros-porteur : 0

Temps moyen porteur : 0

Temps petit porteur : 0

Temps avant le début de traitement en baie : 0

Temps avant le début de traitement au poste : 0

Temps après la fin du traitement : 0

EDITS default time is chosen by the de-icing coordination (Dispatcher & Sub-contractor)

Automatic pre-assignment function

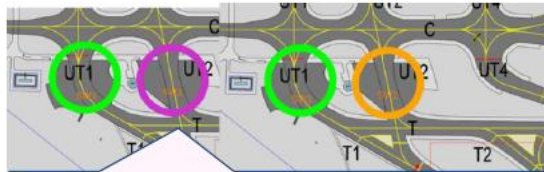
PKG	QFU	Site préférentiel
*	08L	SW
*	08R	SW
*	09R	NW
*	09L	NW
*	27L	NE
*	27R	NE
*	26R	SE
*	26L	SE
J	*	JULIETT N



CPDS & De-icing

SMAN improvements

State of de-icing pads



Green : De-icing pad is open
 Purple : De-icing pad is about to be closed
 Orange : De-icing pad is about to be opened

On stand de-icing information

Vol départ: AZ317
 Callsign: AZA317
 Destination: LIRF
 TAG: C2F
 Pos: 129
 Service: J
 DHC: C24/02/13 07:00
 SORT: 24/02/13 07:00
 TOBT: 24/02/13 07:05
 HLE: 24/02/13 06:20
 Embarquement Formé à 06:30
 PDE Milestones: OKSTART
 PDE Status: SEQUENCED
 TSAT: 24/02/13 07:03
 ASAT: 24/02/13 06:40
 QFU: 26R
 TTOT: 24/02/13 07:27
 SID: OKASI
 Pkg 1: F92 ARR 23/02/13 23:26

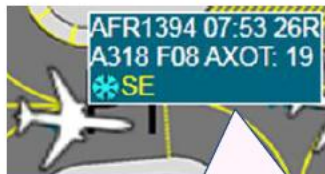
AFR1746 TSAT:07:10
 A318 FGUGH
 ❄️ NE

All PDS Milestones from gate to Rwy. Aircraft type, Rwy, SID

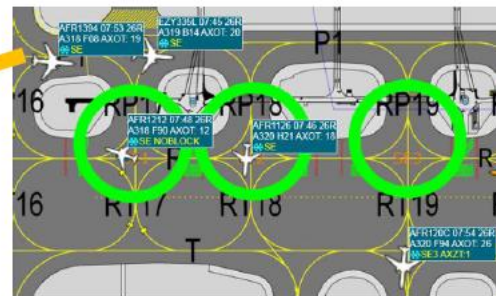
Dégivrage:
 Demande dégivrage: Oui
 Source demande: ATC
 Mode dégivrage: Ray
 Site: SE
 Durée prévue: 1.0
 Demande antigivrage: Non

All information about De-icing

Pre ops de-icing information



TTOT/CTOT, AXOT from gate
 To Rwy

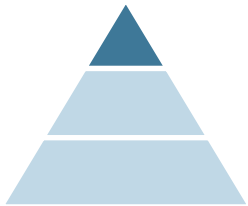


Post ops de-icing information



TTOT/CTOT, AXOT from gate to Rwy
 AXZT = AXOT from de-icing ops to Rwy

CPDS & Departure **FLEX**ibility



DFLEX : Objectives

Airlines can choose the priority of their flights according to their business and A-CDM rules



Protect sensitive flights



Ensure the equity during Adverse conditions

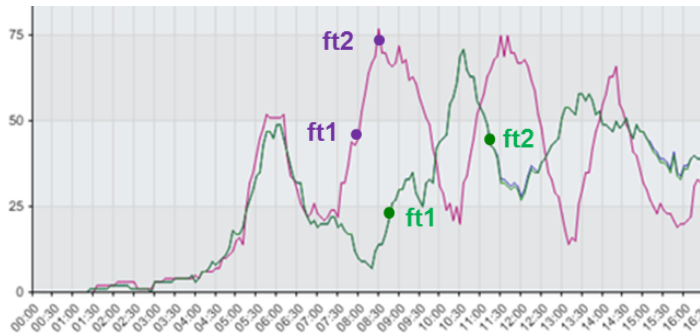


Adherence to UDPP concept

DFLEX : Principle

Context

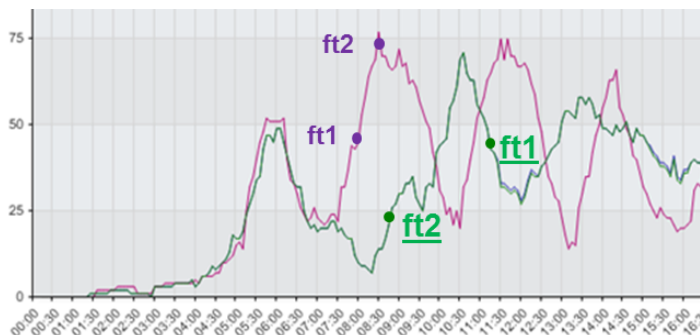
- During adverse conditions (thunderstorm, snow,...), all flights are impacted by reduction of capacity



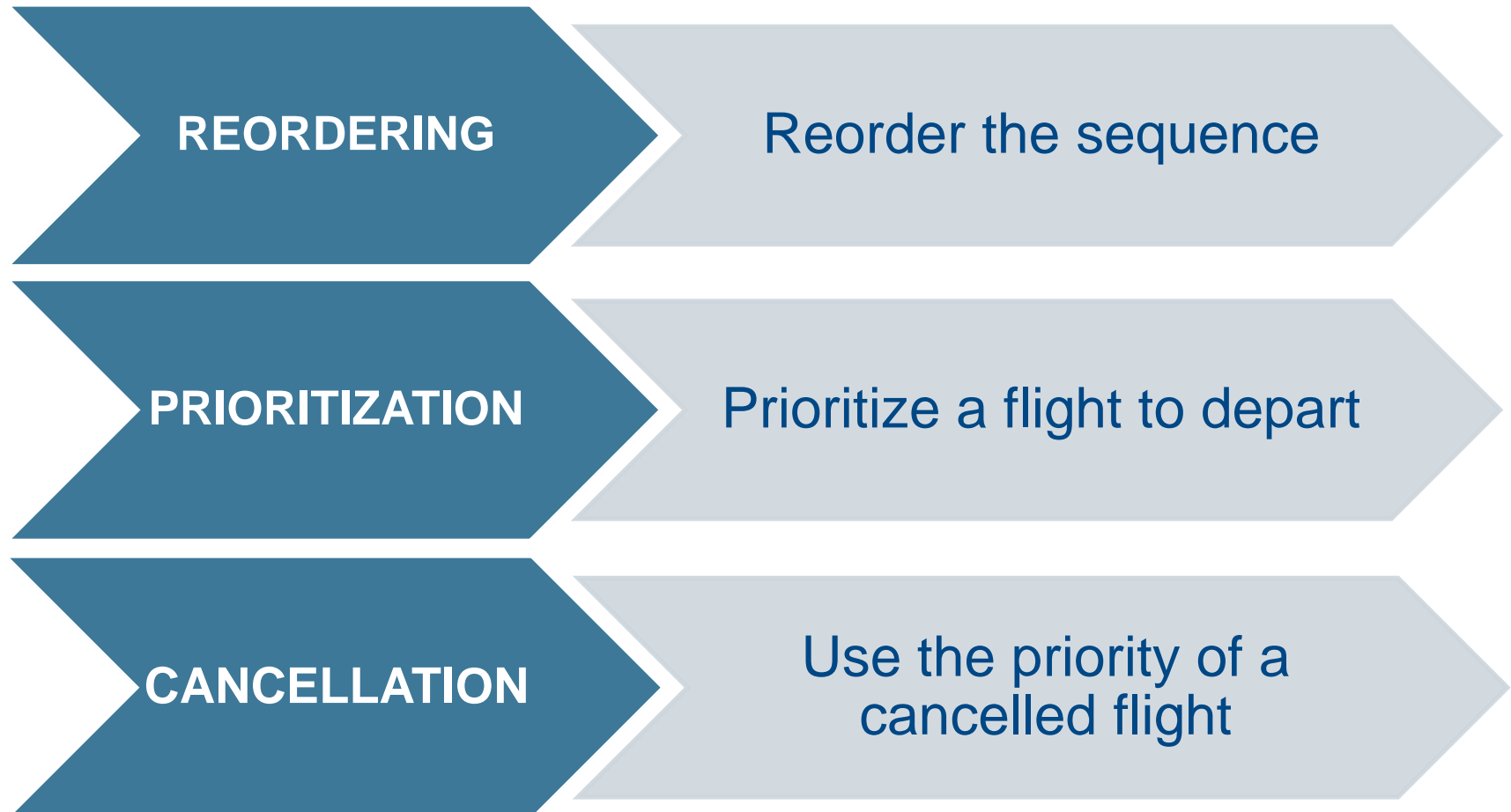
According to PDS algorithm (First Schedule /First Served)
Flight 2 will be sequenced after Flight 1

Objective

- Give flexibility to airlines in the departure sequence

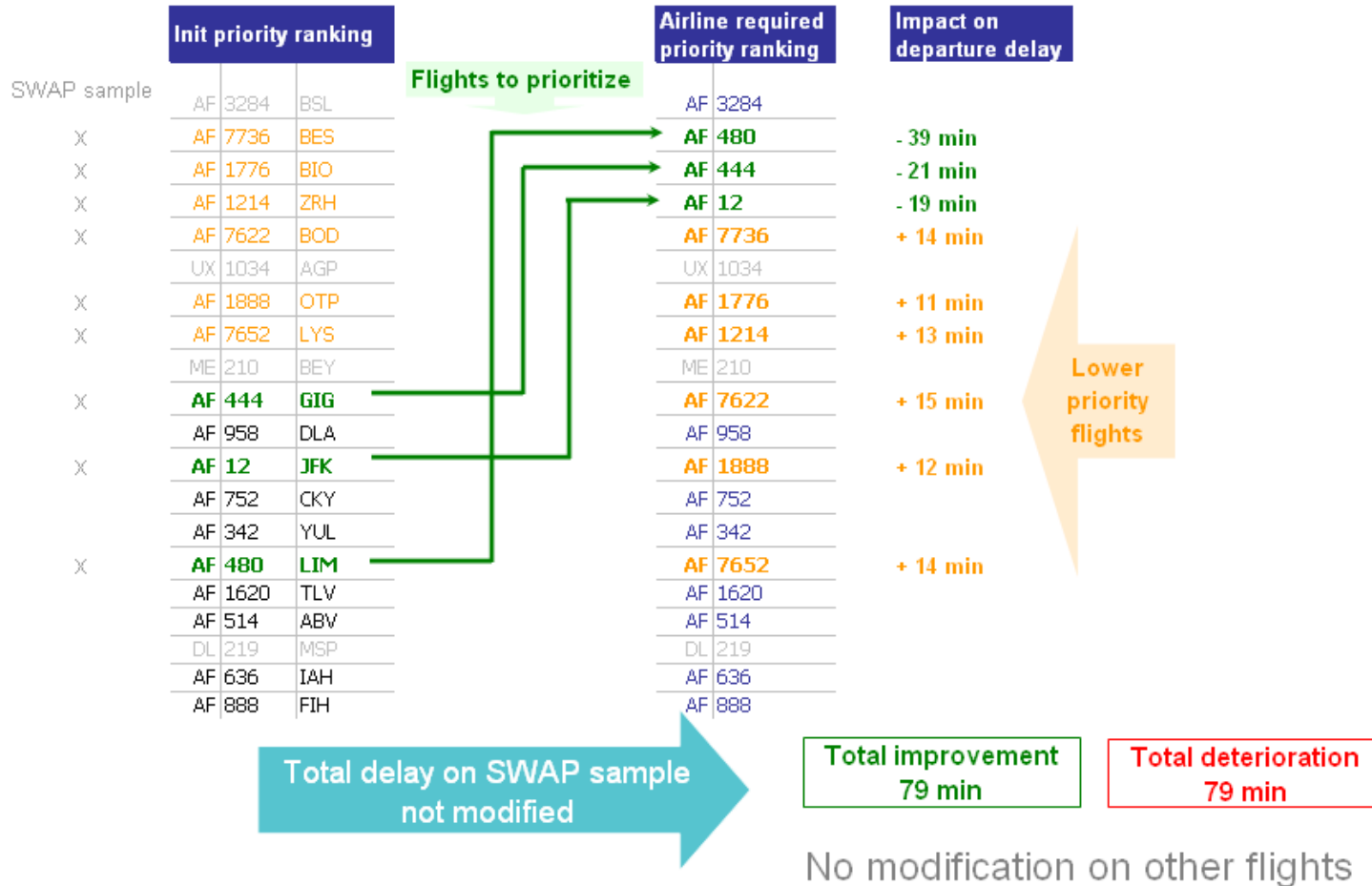


With DFLEX, Flight 2 can be sequenced before Flight 1
The choice is provided by Airlines

DFLEX : FEATURES



DFLEX : 1st FEATURE - REORDERING





DFLEX : 2nd FEATURE - PRIORITIZATION

	Init priority ranking		Airline required priority ranking	Impact on departure delay
	AZ 319 FCO		AZ 319	
	AF 1516 GOA		AF 1516	
	AF 3284 BSL		AF 3284	
	AF 7736 BES		AF 7736	
	AF 1776 BIO		AF 1776	
X	AF 1214 ZRH	Flight to prioritize	AF 12	- 24 min
X	AF 7622 BOD		AF 1214	+ 3 min
	UX 1034 AGP		UX 1034	
X	AF 1888 OTP		AF 7622	+ 6 min
X	AF 7652 LYS		AF 1888	+ 3 min
	ME 210 BEY		ME 210	
X	AF 444 GIG		AF 7652	+ 6 min
X	AF 958 DLA		AF 444	+ 3 min
X	AF 12 JFK		AF 958	+ 3 min
	AF 752 CKY		AF 752	
	AF 342 YUL		AF 342	

Total delay on SWAP sample not modified

Total improvement 24 min on AF12

Total deterioration 24 min on six AF flights

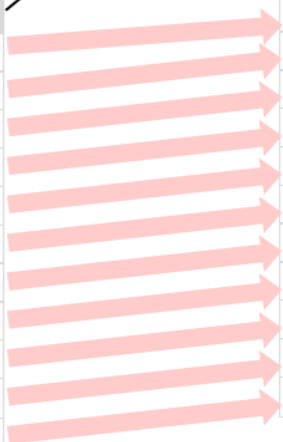
No modification on other flights



DFLEX : 3rd FEATURE - CANCELLATION

Init priority ranking			STD CNL				DFLEX CNL				
			Automatic priority ranking		Impact on delay	Airline priority ranking		Impact on delay			
OU	473	ZAD	OU	473	ZAD		OU	473	ZAD		
EZY	3971	BES	EZY	3971	BES		EZY	3971	BES		
BIE	6090	MIR	BIE	6090	MIR		BIE	6090	MIR		
SU	260		SU	260	SVO		SU	260	SVO		
BIE	6214	DJE	BIE	6214	DJE		BIE	6214	DJE		
AF	2042	GVA	TS	189	YUL	-3 min	AF	1890	IST	-18 min	
TS	189	YUL	AA	41	ORD	-3 min	TS	189	YUL		
AA	41	ORD	EZY	3717	AJA	-3 min	AA	41	ORD		
EZY	3717	AJA	AH	1003	ALG	-3 min	EZY	3717	AJA		
AH	1003	ALG	RO	382	OTP	-3 min	AH	1003	ALG		
RO	382	OTP	AF	1890	IST	-3 min	RO	382	OTP		
AF	1890	IST	AF	2584	TUN	-3 min	AF	2584	TUN	-3 min	
AF	2584	TUN	AF	1726	VCE	-3 min	AF	1726	VCE	-3 min	
AF	1726	VCE	LH	1027	FRA	-3 min	AF	2312	LIN	-9 min	
LH	1027	FRA	EI	521	DUB	-3 min	LH	1027	FRA		
EI	521	DUB	AF	2312	LIN	-3 min	EI	521	DUB		
AF	2312	LIN									

Flight cancelled

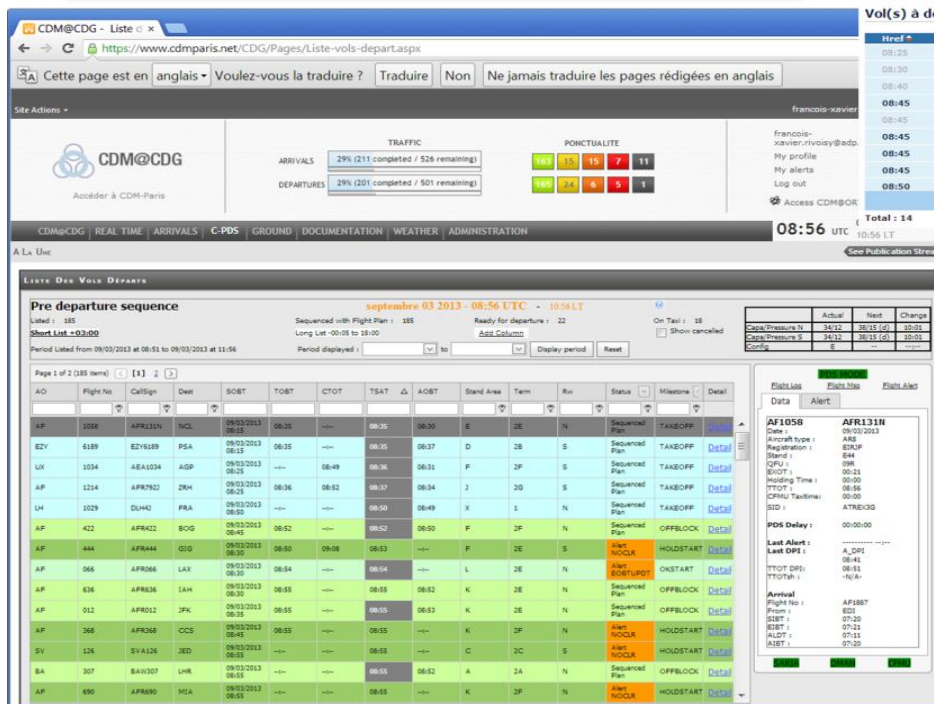


Without DFLEX Substitution
Total improvement 18 min
Spread over all flights until AF 1890

With DFLEX Substitution
Improvement 18 min for AF 1890
Improvement 9 min for AF 2312
Improvement 3 min for all others AF flights

DFLEX : USER INTERFACE

Generic: the CDM website



CDM@CDG - Liste

https://www.cdmparis.net/CDG/Pages/Liste-vols-depart.aspx

Cette page est en anglais - Voulez-vous la traduire? Traduire Non Ne jamais traduire les pages rédigées en anglais

francois-xavier

francois-xavier.rivoisy@adp.fr

My profile

My alerts

Log out

Access CDM@C

CDM@CDG REAL TIME - ARRIVALS - C-PDS - GROUND - DOCUMENTATION - WEATHER - ADMINISTRATION

08:56 UTC 10:56 LT

See Publication Stream

Liste Des Vols Départs

Pre departure sequence

Listed : 185

Short List - 03:00

Period Listed from 09/03/2013 at 08:51 to 09/03/2013 at 11:56

Period displayed: [] to [] Display period: []

AO	Flight No	CallSign	Dest	SOBT	TOBT	CTOT	TSAT	Δ	AGBT	Stand Area	Term	Rev	Status	Milestone	Detail
AF	3358	AFR131N	NCL	09:03/2013 08:15	08:35	---	08:35	---	08:35	E	2E	N	Sequenced Plan	TAKEOFF	Detail
EZ	6189	EZ16189	PSA	09:03/2013 08:35	08:35	---	08:35	---	08:37	D	2B	S	Sequenced Plan	TAKEOFF	Detail
UX	1034	AEA1034	AGP	09:03/2013 08:35	08:49	---	08:36	---	08:31	F	2F	S	Sequenced Plan	TAKEOFF	Detail
AP	1214	AFR792J	ZRH	09:03/2013 08:25	08:36	08:62	08:37	08:34	J	2G	S	Sequenced Plan	TAKEOFF	Detail	
LH	1029	DH40	FRA	09:03/2013 08:50	---	---	08:50	---	08:49	X	1	N	Sequenced Plan	TAKEOFF	Detail
AF	422	AFR422	BOG	09:03/2013 08:45	08:52	---	08:52	---	08:50	F	2F	N	Sequenced Plan	OFFBLOCK	Detail
AF	444	AFR444	GIG	09:03/2013 08:30	08:50	08:08	08:53	---	---	F	2E	S	Alert NOCL	HOLDSTART	Detail
AF	066	AFR066	LAX	09:03/2013 08:30	08:54	---	08:54	---	---	L	2E	N	Alert ROBTURDPT	OKSTART	Detail
AF	636	AFR636	LAH	09:03/2013 08:30	08:55	---	08:55	08:52	K	2E	N	Sequenced Plan	OFFBLOCK	Detail	
AF	011	AFR011	JFK	09:03/2013 08:35	---	---	08:55	---	08:53	K	2E	N	Sequenced Plan	OFFBLOCK	Detail
AF	268	AFR268	CCS	09:03/2013 08:45	08:55	---	08:55	---	---	K	2F	N	Alert NOCL	HOLDSTART	Detail
SV	126	SV1126	JED	09:03/2013 08:55	---	---	08:55	---	---	C	2C	S	Alert NOCL	HOLDSTART	Detail
BA	307	BA1307	LHR	09:03/2013 08:55	---	---	08:55	08:42	A	24	N	Sequenced Plan	OFFBLOCK	Detail	
AF	690	AFR690	NLA	09:03/2013 08:55	---	---	08:55	---	---	K	2F	N	Alert NOCL	HOLDSTART	Detail

Sélection des vols candidats au swap - Dflex normal

Numéro de vol: 3646 Date: 26-07-2013 Méme QFU: Priorisation optimum: Type courrier: Tous

Rechercher Dflex NORMAL ->Dflex Inversé

Vol à prioriser

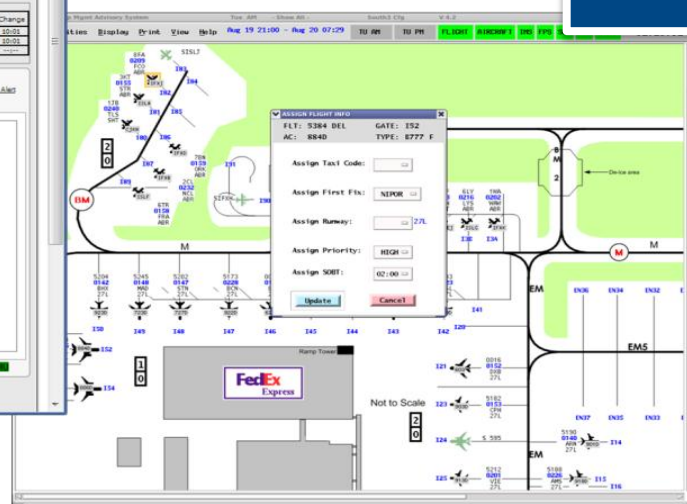
Href	Vol com	Dest	SOBT	COBT	TOBT	TSAT	QFU	Retard TSAT	Ecart TSAT/Butée PN	Marge Bdt.
09:00	AF3846	LOS	09:00	-	-	09:20	OBL	+ 00:20	-	+ 04:29

Total : 1

Vol(s) à déprioriser

Href	Vol com	Dest	SOBT	COBT	TOBT	TSAT	Méme QFU	Retard TSAT	Ecart TSAT/Butée PN	Marge Bdt.
08:25	AF1888	OTR	08:25	08:50	09:00	09:00	Oui	+ 00:00	+ 02:40	- 00:05
08:30	AF 456	GRU	08:30	-	09:00	09:00	Oui	+ 00:00	-	- 00:16
08:40	AF 192	BLR	08:40	08:57	-	09:00	Oui	+ 00:03	-	- 00:07
08:45	AF 368	CCS	08:45	-	10:10	10:10	Oui	+ 00:00	-	+ 03:23
08:45	AF 422	BOG	08:45	-	08:55	08:52	Oui	+ 00:07	-	+ 00:41
08:45	AF 896	BZV	08:45	09:09	09:15	09:15	Oui	+ 00:00	-	+ 01:04
08:45	AF 976	LBV	08:45	09:05	08:55	08:58	Oui	- 00:07	-	+ 03:33
08:45	AF3578	TNR	08:45	-	09:05	09:05	Oui	+ 00:00	-	-
08:50	AF 218	BOH	08:50	09:02	-	09:06	Oui	+ 00:04	-	-

Stakeholders HMI (OCC)



AF1058 AFR131H

Date: 09/03/2013

Account type: A38

Registration: EDPF

Stand: 841

QFU: 098

Holdring Time: 00:00

CTOT: 08:51

CPMU Taxtime: 08:56

SID: ATREK3G

PDS Delay: 00:00:00

Last Alert: A 205

Last DPT: 08:45

TRIP DPT: 08:51

TTOT: -N/A-

Arrival Flight No: AF1887

From: EDP

SIBT: 07:20

SIBT: 09:42

ALDT: 07:11

SIBT: 07:30

Assign Taxi Code: []

Assign First Fix: NEPR []

Assign Runway: []

Assign Priority: HIGH []

Assign SOBT: 02:00 []

Update [] Cancel []

DFLEX : Agreement management HMI

CDM-GLD
Version PréV3.0.4993

Séquence départs bloc
Alertes
Accrochage Manuel
Journaux
DFLEX
Administration

Home > Administration > Gestion paramètres > Paramètres fonctions DFLEX > Gestion Accords

Gestion paramètres
 Temps roulage généraux
 Gestion des QFU
 Paramètres TSAT
 Para
 Para
 Para
 Paramètres Deicing
 temps roulage
 Paramètres fonctions DFL
 Gestion Délégations
Gestion Accords
 Association Accords
 Activation des fonctions
 Reset Dflex
 Gestion des profils
 Saisie de secours
 Configuration
 Param site décollage

See only my agreements

Add	Accord	Créateur
<input type="button" value="Delete"/>	AF-KLM	ADP-NT\RIVOISY
<input type="button" value="Delete"/>	AGREE1NEW	ADP-NT\DEBRUYM
<input type="button" value="Delete"/>	LH	ADP-NT\LINAIS
<input type="button" value="Delete"/>	LO	ADP-NT\LINAIS
<input type="button" value="Delete"/>	newEXTRA	laurence.debr
<input type="button" value="Delete"/>	Test1	ADP-NT\CHARRON
<input type="button" value="Delete"/>	Test2	ADP-NT\CHARRON
<input type="button" value="Delete"/>	un accord	ADP-NT\apostol

AO (IATA)	Flight No	Calsign	Destination OACI	Début validité	Fin validité	Add
AF			KJFK	09/03/13	09/30/13	<input type="button" value="Delete"/>
KL			KJFK	09/03/13	09/30/13	<input type="button" value="Delete"/>

**Ex: All flights AFR & KLM to JFK
between 09/3/13 to 09/30/13 can be DFLEX**

Utilisateur
 ATC@AIRFRANCE.FR

AFR - KLM Agreement

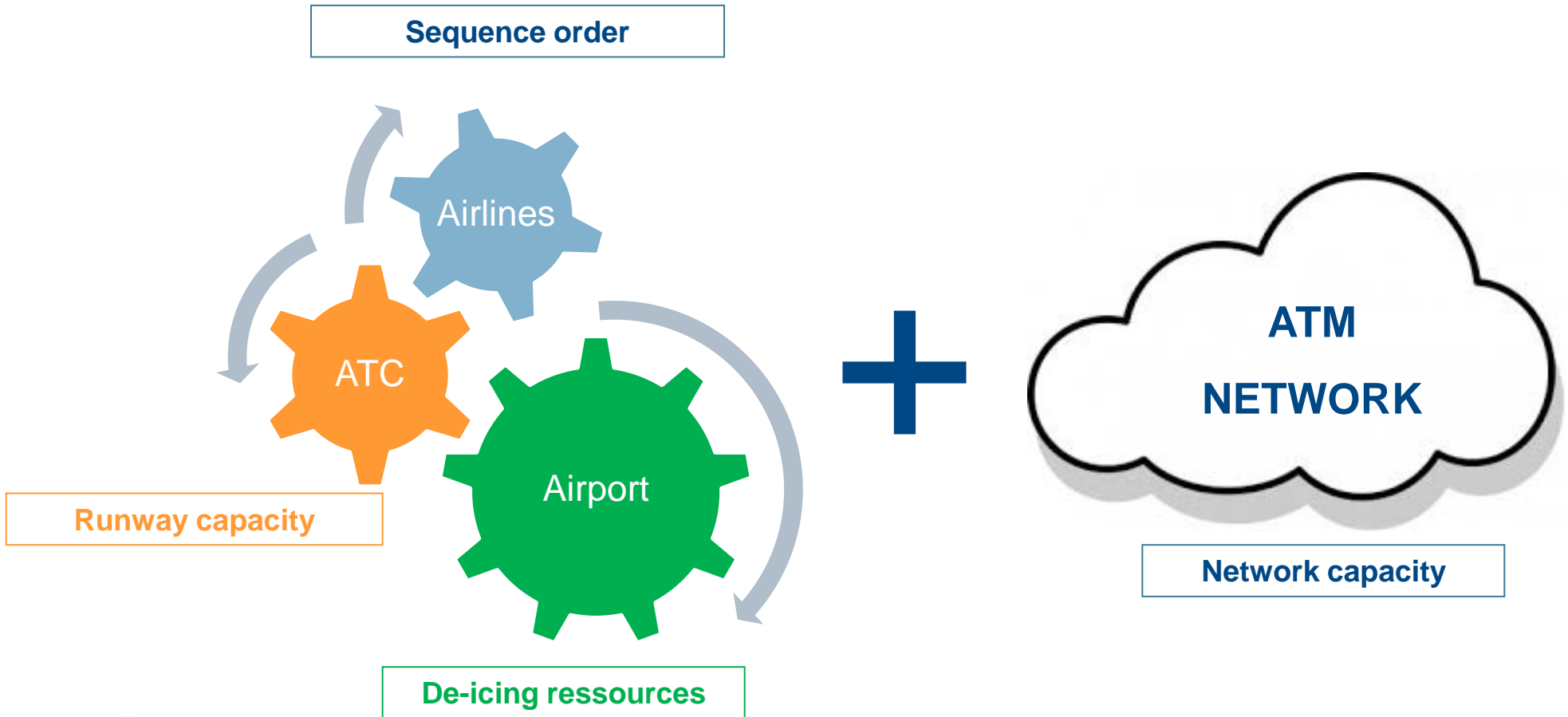
Ex: All flights AFR & KLM to JFK
between 09/3/13 to 09/30/13 can be DFLEX

Managed by Air France ATC cell



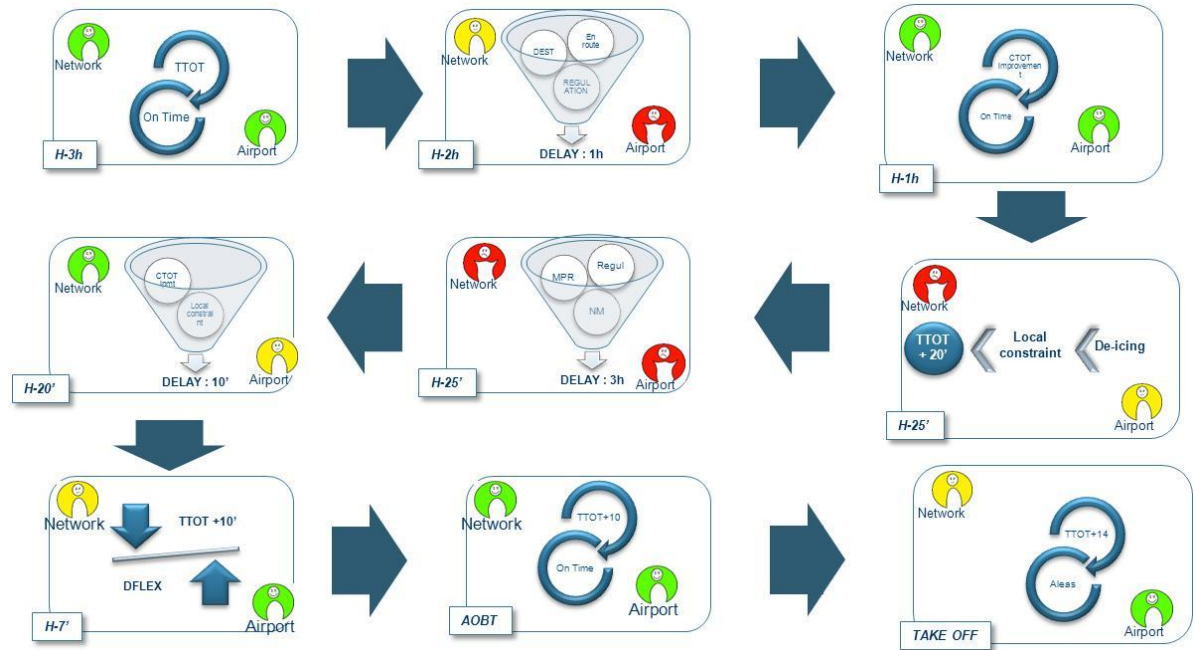
Challenges

Keep and increase Throughput, Predictability, and Efficiency !



Airport / Network Relations

Use case



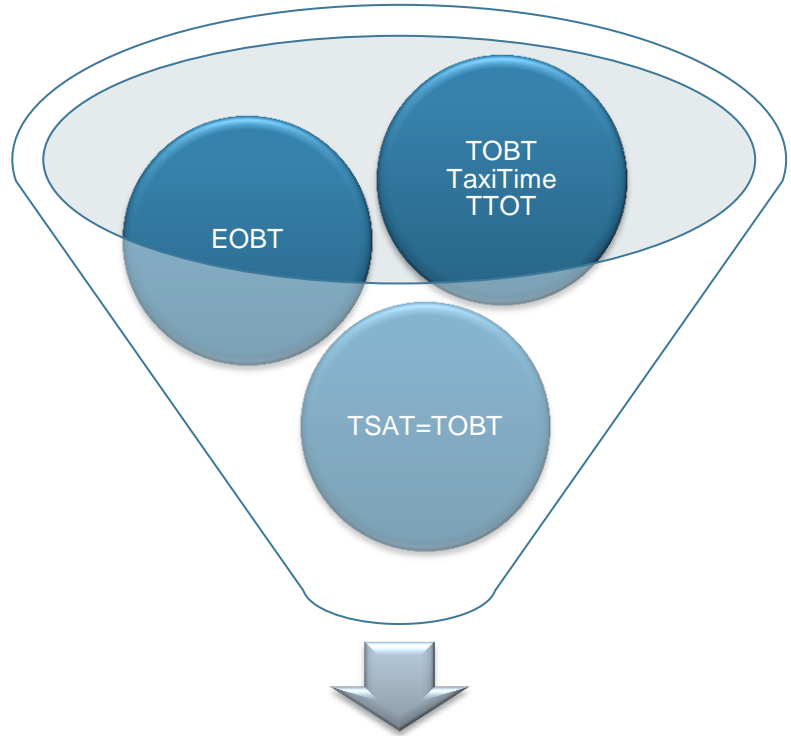


AIRPORT / NETWORK RELATIONS – EXAMPLE OF A FLIGHT DEPARTURE FROM LFPG

H-3

- ETFMS
- C-PDS**
- De-ice
- DFLEX
- SMAN

TimeStamp	Value
SOBT	09:00
TTOT	09:10
EXOT	00:10
TSAT	09:00



Network



Airport



AIRPORT / NETWORK RELATIONS – EXAMPLE OF A FLIGHT DEPARTURE FROM LFPG

H-2

ETFMS

C-PDS

De-ice

DFLEX

SMAN



CTOT



TimeStamp	Value
SOBT	09:00
CTOT	10:00
TTOT	10:00
EXOT	00:10
TSAT	09:50
TTOTsh	0910



Network



Airport



AIRPORT / NETWORK RELATIONS – EXAMPLE OF A FLIGHT DEPARTURE FROM LFPG

H-1

ETFMS

C-PDS

De-ice

DFLEX

SMAN



TimeStamp	Value
SOBT	09:00
CTOT	09:10
TTOT	09:10
EXOT	00:10
TSAT	09:00

ATFCM



Network



Airport



AIRPORT / NETWORK RELATIONS – EXAMPLE OF A FLIGHT DEPARTURE FROM LFPG

H-25'

ETFMS

C-PDS

De-ice

DFLEX

SMAN



TimeStamp	Value
SOBT	09:00
CTOT	09:10
TTOT	09:30
EXOT	00:20
ERWT	00:10
TSAT	09:10



Network



Airport



AIRPORT / NETWORK RELATIONS – EXAMPLE OF A FLIGHT DEPARTURE FROM LFPG

H-25'

ETFMS

C-PDS

De-ice

DFLEX

SMAN



Most
Penalising
Regulation

CTOT



TimeStamp	Value
SOBT	09:00
CTOT	12:00
TTOT	12:00
EXOT	00:20
ERWT	00:10
TSAT	11:50
TTOTsh	09:30



Network



Airport



AIRPORT / NETWORK RELATIONS – EXAMPLE OF A FLIGHT DEPARTURE FROM LFPG

H-20'

ETFMS

C-PDS

De-ice

DFLEX

SMAN



TimeStamp	Value
SOBT	09:00
CTOT	09:30
TTOT	09:30
EXOT	00:20
ERWT	00:10
TSAT	09:10

ATFCM



Network



Airport



AIRPORT / NETWORK RELATIONS – EXAMPLE OF A FLIGHT DEPARTURE FROM LFPG

H-20'

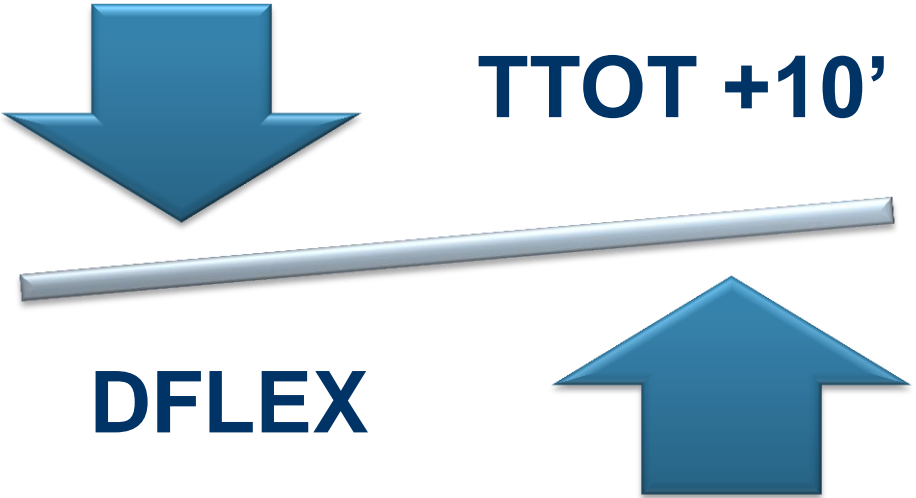
ETFMS

C-PDS

De-ice

DFLEX

SMAN



TimeStamp	Value
SOBT	09:00
CTOT	09:30
TTOT	09:30
EXOT	00:20
ERWT	00:00
TSAT	09:10
TTOTsh	09:20



Network



Airport



AIRPORT / NETWORK RELATIONS – EXAMPLE OF A FLIGHT DEPARTURE FROM LFPG

H-20'

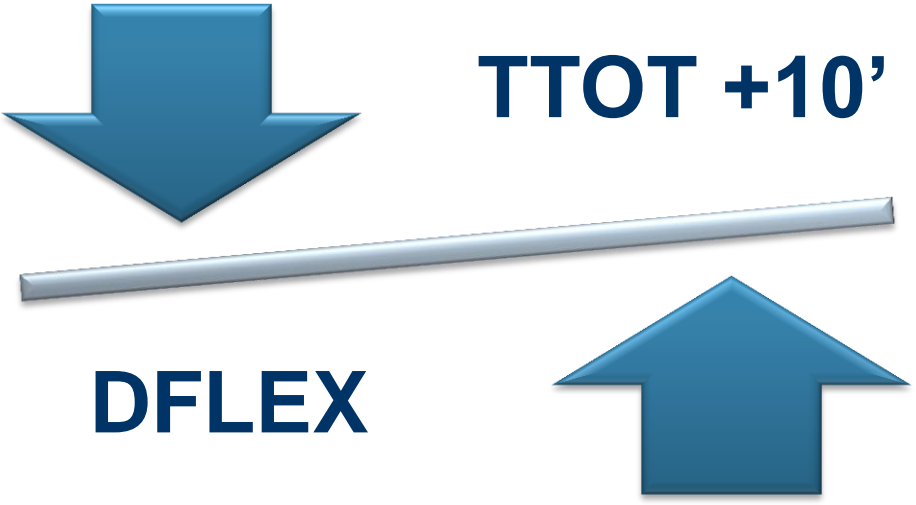
ETFMS

C-PDS

De-ice

DFLEX

SMAN



TimeStamp	Value
SOBT	09:00
CTOT	09:20
TTOT	09:20
EXOT	00:20
ERWT	00:00
TSAT	09:00



Network



Airport



AIRPORT / NETWORK RELATIONS – EXAMPLE OF A FLIGHT DEPARTURE FROM LFPG

AOBT

ETFMS

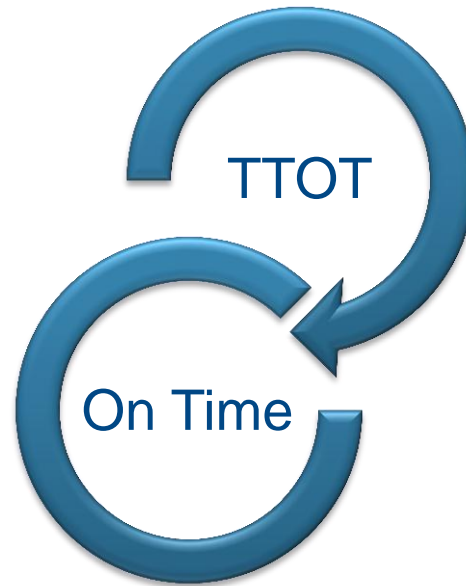
C-PDS

De-ice

DFLEX

SMAN

TimeStamp	Value
SOBT	09:00
CTOT	09:20
TTOT	09:30
EXOT	00:20
ERWT	00:10
TSAT	09:00
AOBT	09:00



Network



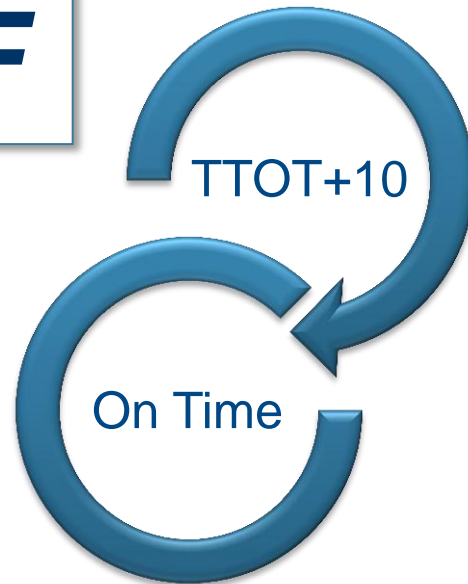
Airport



AIRPORT / NETWORK RELATIONS – EXAMPLE OF A FLIGHT DEPARTURE FROM LFPG

- ETFMS
- C-PDS
- De-ice
- DFLEX
- SMAN

TAKE OFF



TimeStamp	Value
SOBT	09:00
CTOT	09:20
ATOT	09:30
EXOT	00:24
ERWT	00:10
TSAT	09:00
AOBT	09:00



Network



Airport



CPDS : Operational Feedback

They like

- ✓ **TSAT : Unique reference / shared goal (all)**
- ✓ **Sequence stability (Crews/ATCO)**
 - TSAT frozen at ASAT
- ✓ **Flexibility (Airline/Handler)**
 - AOBT, up to 15' before SOBT if possible
 - TSAT tolerance $TSAT - 5' < AOBT < TSAT + 5'$
 - Priorities management
- ✓ **TSAT = TOBT (Airline/Handler)**
 - To be used only in absolute necessity
- ✓ **Less waiting time at Threshold (Crews/ATCO)**
- ✓ **Turnaround optimization (Airlines/Handler/Airport)**
 - Aircraft stand (Airport)
 - Turn around operations (Airlines/Handler)
- ✓ **Network Benefits**
 - TTOT Predictability (ACC/NM) 3h before AOBT
 - Flight Plan and Airport Slot Consistency Service (FAS)
 - Automatic REA

To improve

- ✓ **Taxitime vs Punctuality (Airline/Airport)**
 - What is the good parameter ?
- ✓ **Sequence stability (in certain cases)**
 - Too many strips (ATCO)
 - Too many TOBT (Airport, ANSP)
 - Runway sequence (ASNP/Airport/NM)
- ✓ **EOBT vs TOBT (Airline/Handler/Airport)**
 - Need to update only once of both
- ✓ **Global Priority Management (all)**

ADVERSE CONDITIONS



ADVERSE CONDITIONS

Call conferences

- Regular and crises call conferences

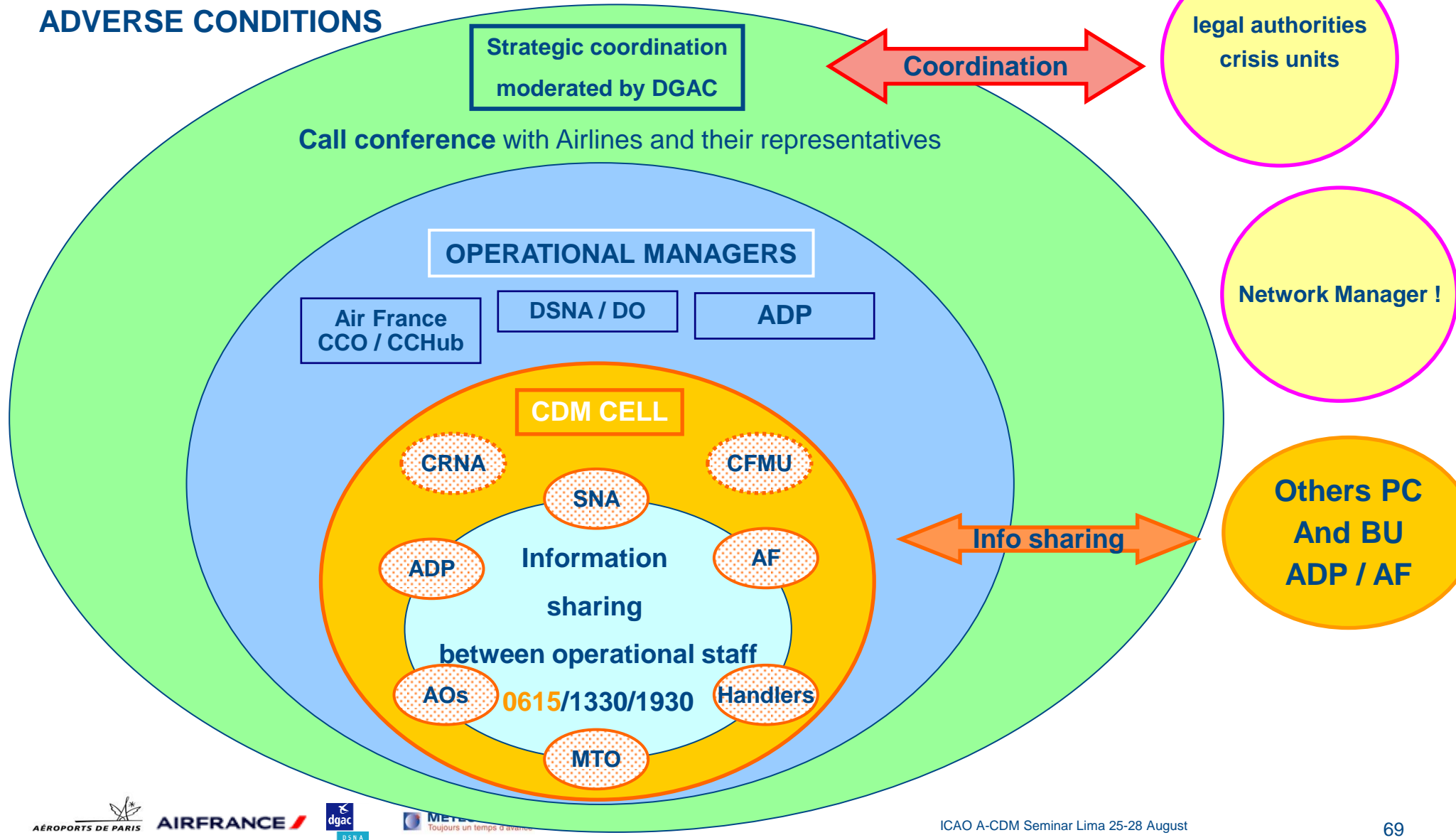


Adverse conditions management

- Organisation
- CDM Cell

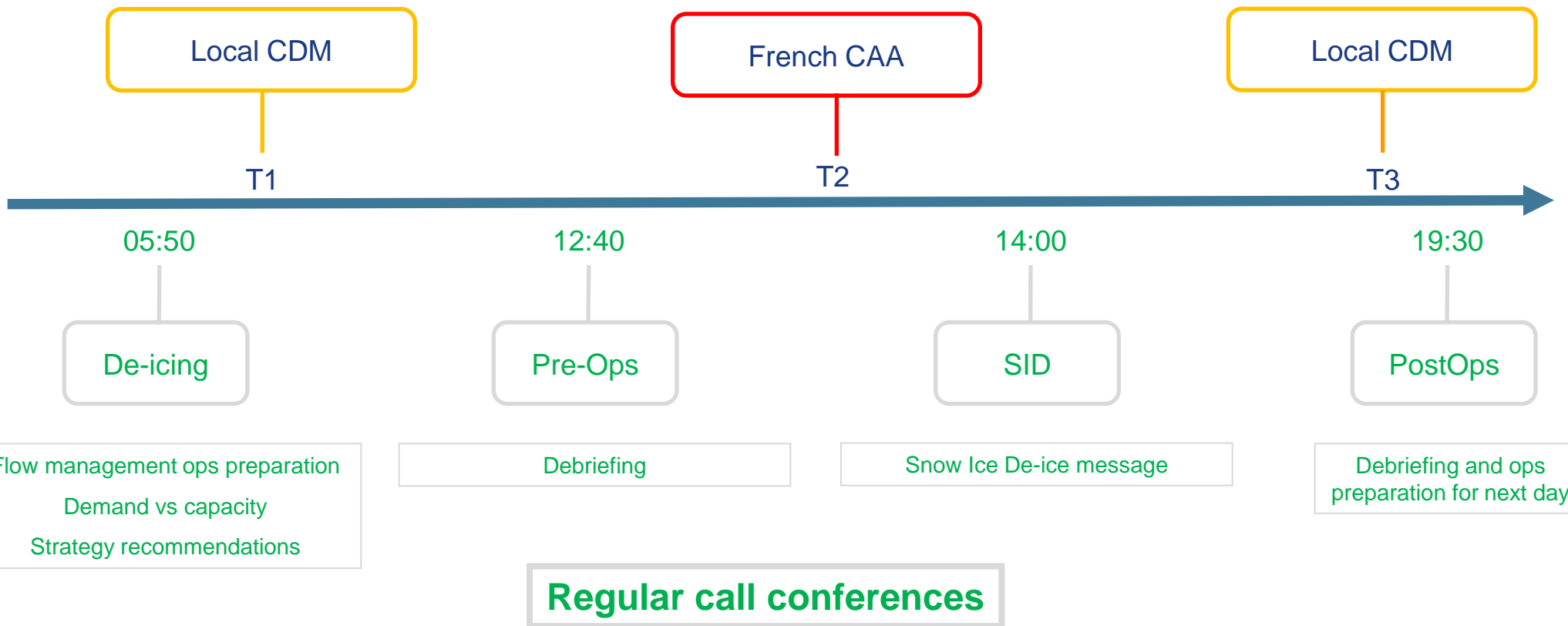


ADVERSE CONDITIONS



ADVERSE CONDITIONS : Call conferences

CRISIS call conferences
Frequency according to the level of the crisis

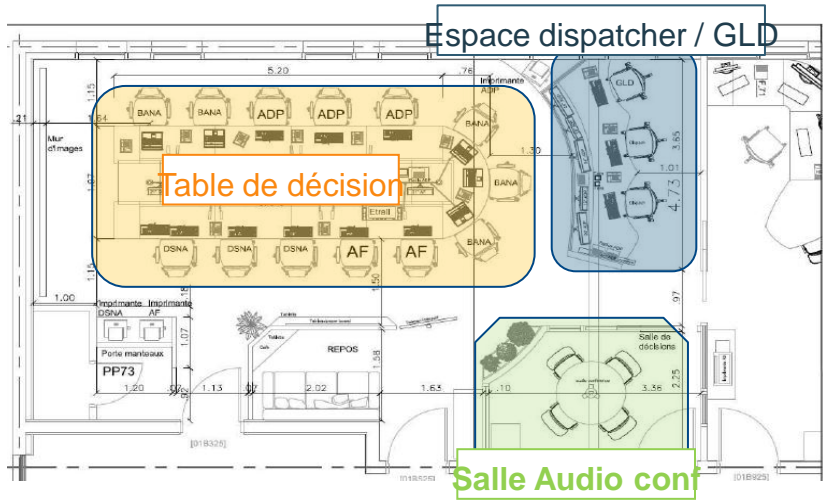




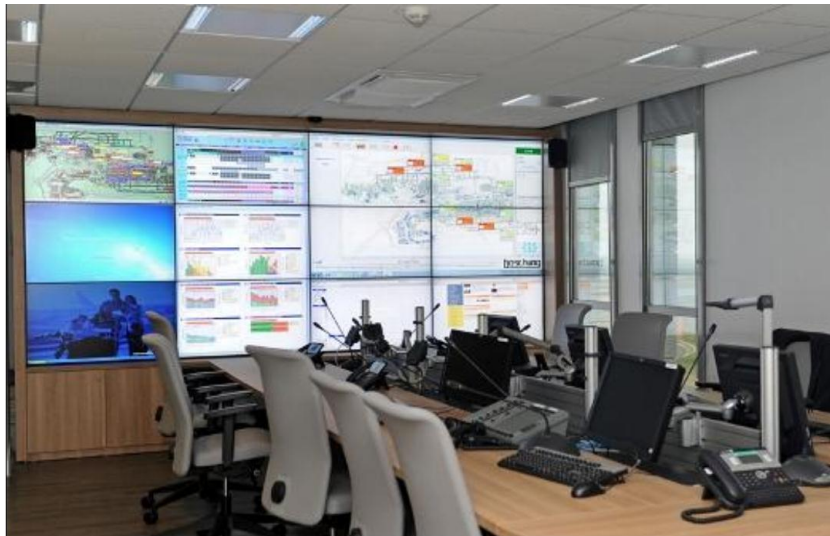
Adverses conditions : CDM Cell



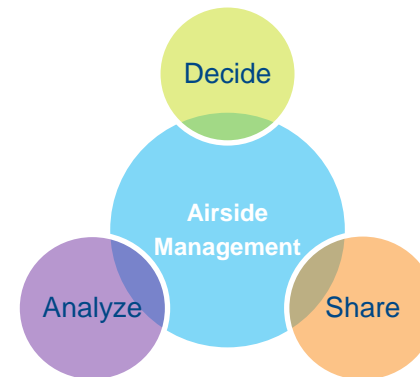
Adverses conditions : CDM Cell



In adverses conditions, operational staff gather in the CDM Cell to analyze the situation and make tactical decisions.



Decide together within the constraints of each



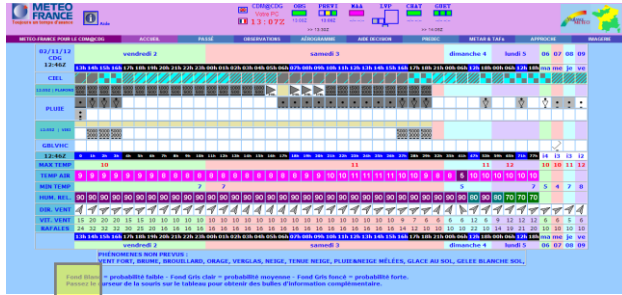
Development of tactical solutions on resource utilization (runways, de-icing,...), and impact on traffic

Continuous sharing of information available to all participants

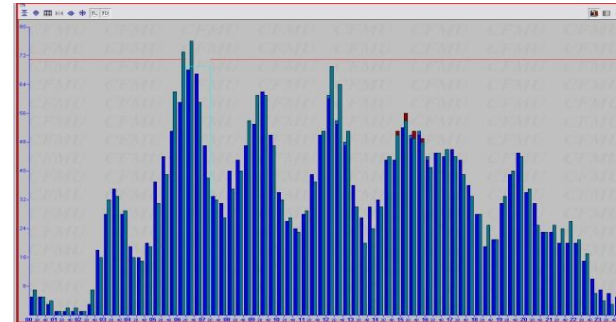


Adverses conditions : CDM Cell - Pre-tactical work (D-1) during winter conditions

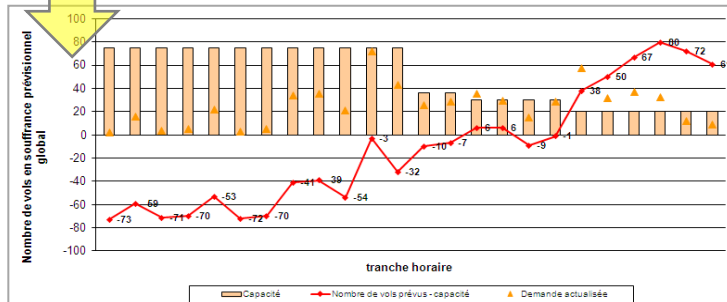
Meteorological forecast



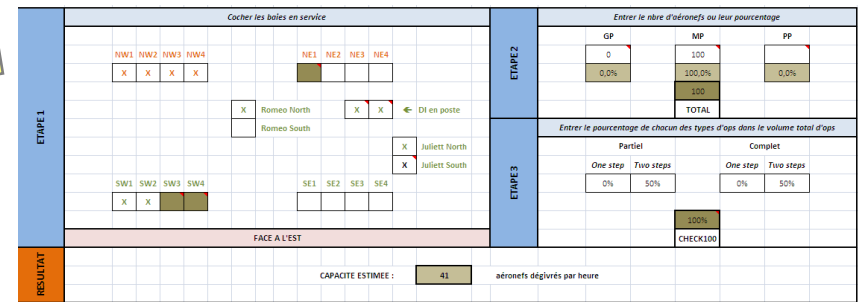
Global traffic forecast



Simtraffic : Airport capacity and departure forecast



Eskimo : Deicing capacity forecast



Share and analyze

Decision

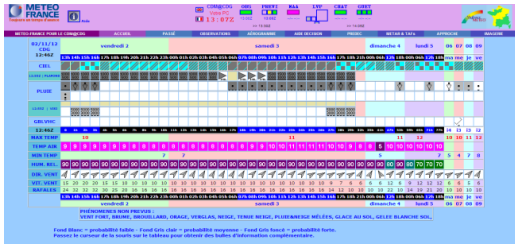
- Levels of operational collaboration
- Deicing & snow clearing means
- Proposition of reduction of flights (cancellations)

And other information or partner constraint that can impact traffic flow



Adverses conditions : CDM Cell - Tactical work during winter conditions

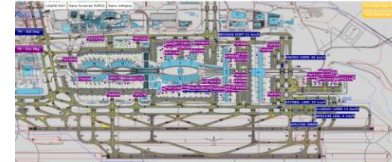
Meteorological forecast



Runway freezing point



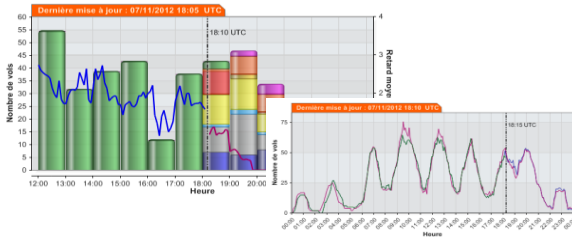
Surface Manager suite



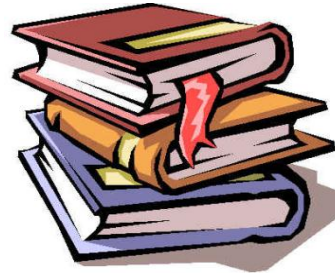
Local ATC data



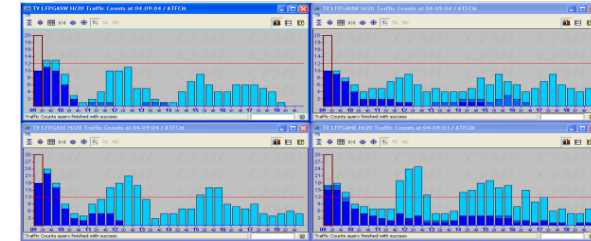
Real-time indicators : Traffic load deicing indicators, ...)



Snow plan



Network data

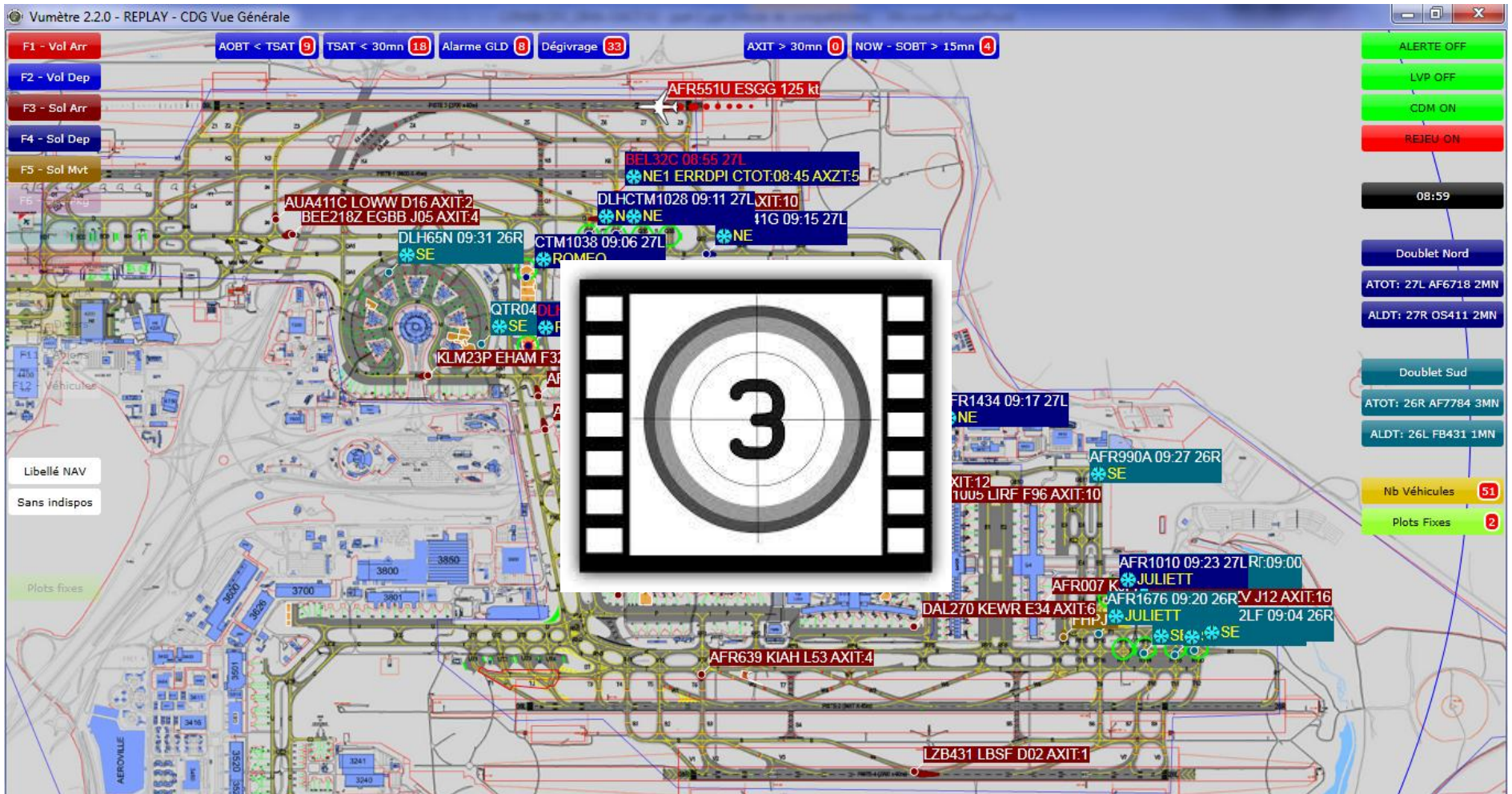


And other information!

- Airport capacity strategy (DMAN and deicing manager settings)
- Runway snow cleaning strategy

Share and analyze

Decision

Adverses conditions : CDM Cell - Example : 24/01/2015 – Snow (local) Event


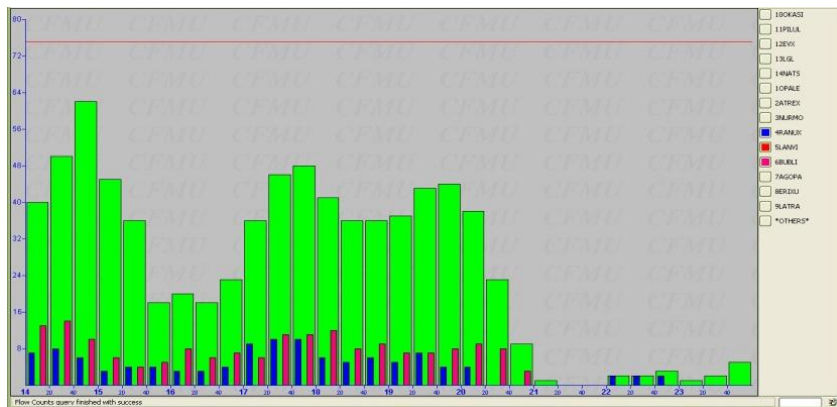
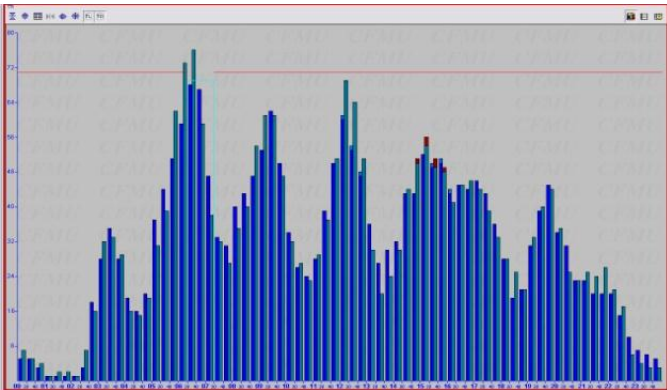
Capacity optimization





Real time Optimization : Paris-ACC and CDG-APP

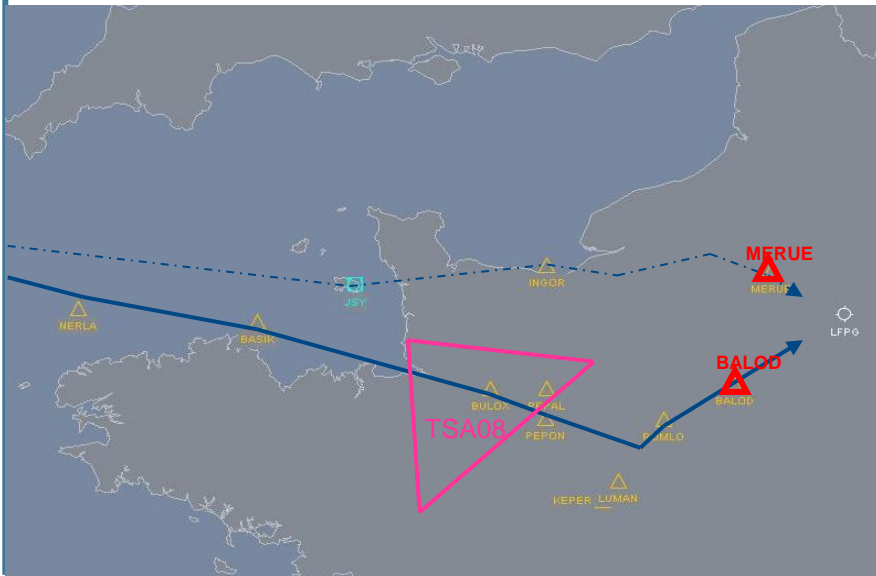
Traffic loads and Flow counts forecast with CHMI



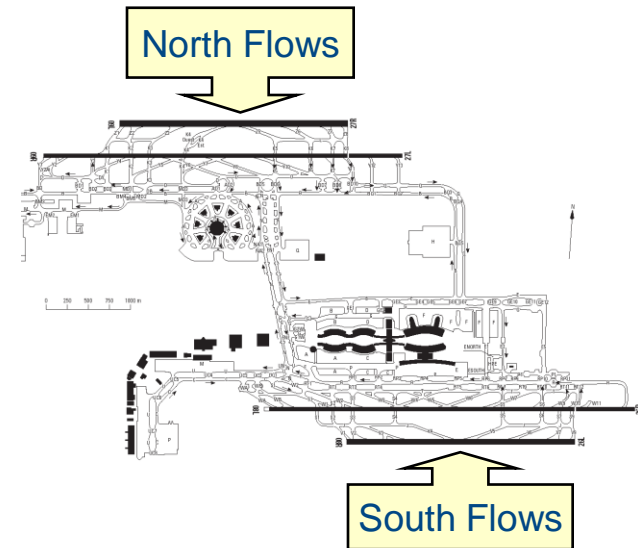
Arrival sequence with AMAN

PG_E	PO_E	ANTICROISEMENT	ACTIF	SEQ	10:14:32
PISTE	INI1	INI2	HORS SEQUENCE : 1		
10:50			49 AFR2495	O 38	B735
10:45	45 AFR2565	L 29	47 AFR2003	O 31	A320
	43 EWG311	V 26	45 AFR1357	O 26	B735
	41 LOT335	L 37	43 MAU044	O 27	A342
10:40	39 CSA766	L 25	40 AF038QF	O 24	A320
	38 LGL1201	V 22	37 AFR172	O 19	B744
10:35	36 AFR773	L 22	35 VRG722	B 23	MD11
			33 MAS014	O 15	A342
			31 TYR2651	O 15	DHC7
10:30	31 AFR1071	M 23	29 GFA018	O 13	B762
	30 AFR023	M 22	28 AZA322	O 11	A321
	28 AFR1731	L 12	26 UAE015	O 09	A310
10:25	26 AFR042	M 07	24 AF665NT	B 12	A320
			22 AFR2523	O 06	B733
			21 BAW992	M 13	B734
10:20	23 DLH2160	L 07	20 CPA027	O 04	B744
	21 FIN871	L 05	17 AF787FZ	B 06	B733
10:15	19 KLM325	L 01	15 AFR042	M 07	B741
	17 AFR042	M 07	09L:100s	NS / NS	
			08R:100s	NS / NS	
			07:120s	NS / NS	

First CDM achievements

IAF Traffic Load balancing (since dec 208)

Arrival Regulation per Flow (since june 2010)

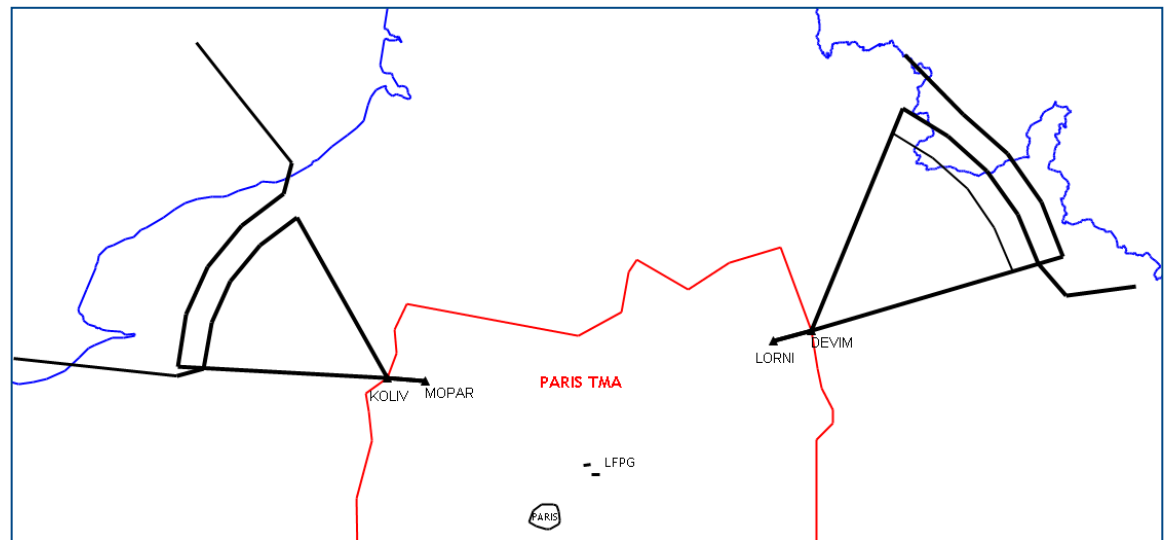
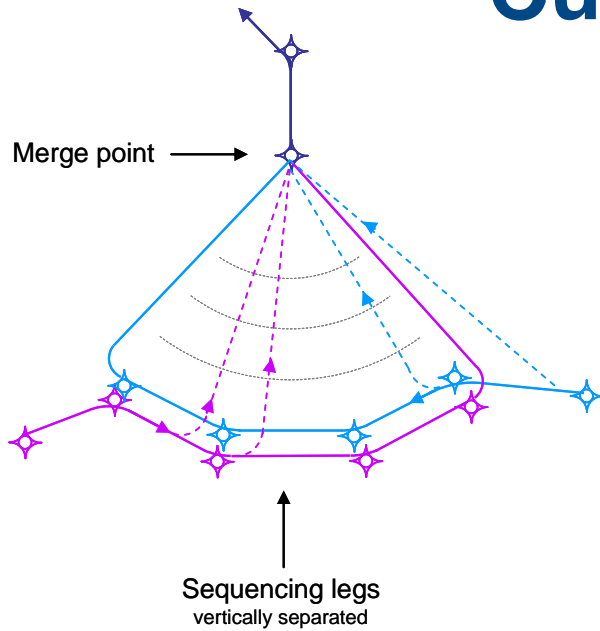
Splitted into ARN and ARS



Demonstrated Results:

- Arrival cap increase while keeping high level of safety
- Better balance of traffic load on N and S rwys (less complexity for ATCO, better efficiency)
- ATC delay reduction during the morning arrival peak
- More flexibility in Flow management

Currently : MERGE Point

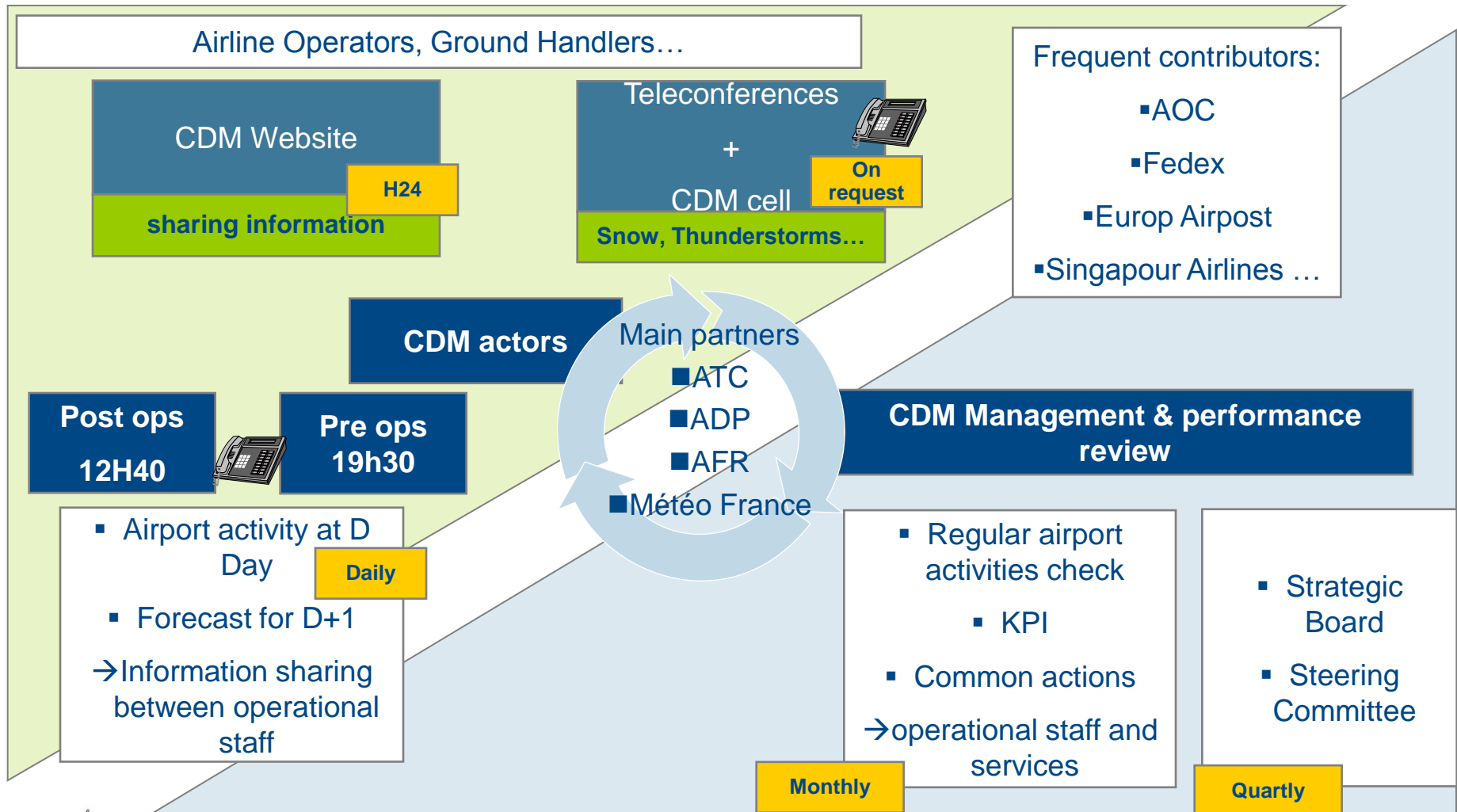


Performance Management





Operational Principles





CDM Monthly meeting (1/2)

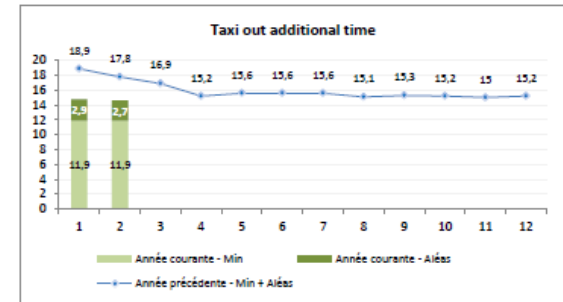
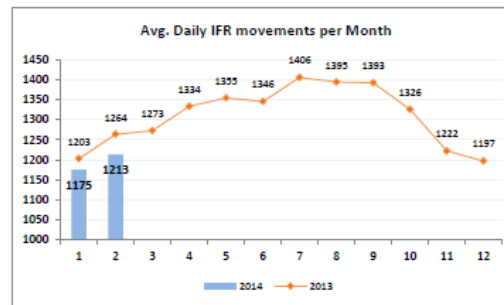
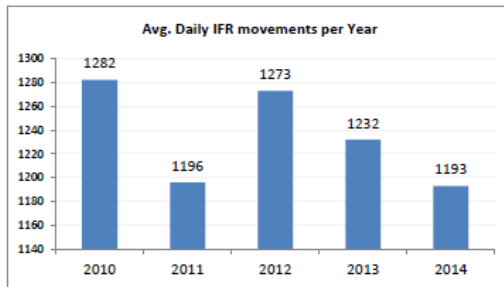
- Regular assessment, based on high level KPI



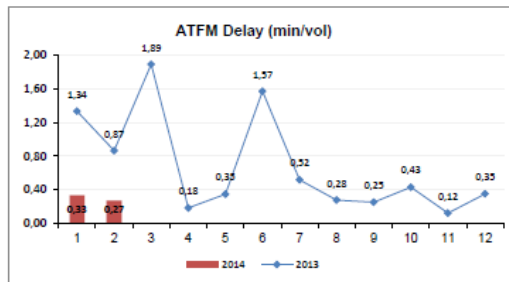
Performance Monitoring

february 2014

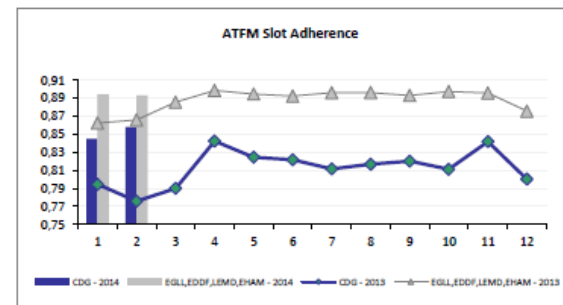
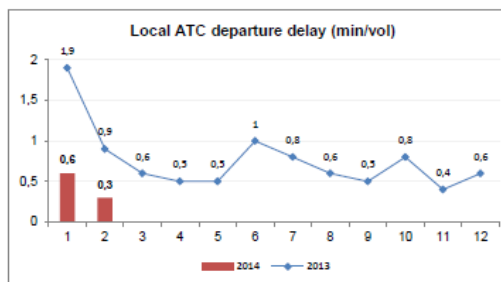
Traffic [Arr + dép]



INBOUND traffic flow



OUTBOUND traffic flow



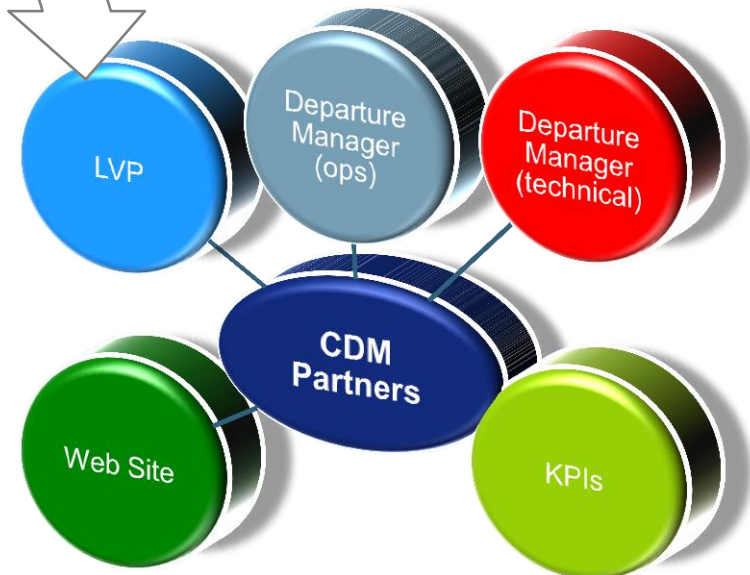


CDM Monthly meeting (2/2)

Feedback on identified days

And launch a dedicated Task force if necessary

jour	Réussite CDM	autres conditions additionnelles	préoccupations (nombre AOP)	départure impact CDM (nombre AOP)	Commentaires	préoccupations (nombre AOP)	Commentaires
vendredi 1 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06		As ouvert pendant P1 arrivée + réglé P3 suite travaux seul
samedi 2 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06		
dimanche 3 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06		
lundi 4 juin 2012		Travaux Piste 06/07	82%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		
mardi 5 juin 2012		Travaux Piste 06/07	82%	0%	Travaux seul 06		
mercredi 6 juin 2012		Travaux Piste 06/07	84%	0%	Travaux seul 06		
jeudi 7 juin 2012	C	Travaux Piste 06/07	100%	0%	Orages : espacement des départ Est + arrb décollage stock étage		Orages - régulation ATFCM + alerte dans TSA
vendredi 8 juin 2012		Travaux Piste 06/07	100%	11%	Travaux seul 06 + retard mg TOBT l'arrivée ?		
samedi 9 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06		
dimanche 10 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		
lundi 11 juin 2012		Travaux Piste 06/07	100%	12%	Travaux seul 06 + retard mg TOBT l'arrivée ?		
mardi 12 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		
mercredi 13 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		
jeudi 14 juin 2012	C	Travaux Piste 06/07	100%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		Régulation voir SWSO P2 et SWSO P3 puis SWSO
vendredi 15 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		Régulation voir SWSO P2 et SWSO P3
samedi 16 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		
dimanche 17 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		
lundi 18 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		
mardi 19 juin 2012		Travaux Piste 06/07	100%	11%	Travaux seul 06 + retard mg TOBT l'arrivée ?		
mercredi 20 juin 2012		Travaux Piste 06/07	100%	0%	Orages + Travaux seul 06 + retard mg TOBT l'arrivée ?		Déclat orages isolats
jeudi 21 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		
vendredi 22 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		
samedi 23 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		
dimanche 24 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		
lundi 25 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		
mardi 26 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		
mercredi 27 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		Déclat orages
jeudi 28 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		Déclat orages
vendredi 29 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		Déclat orages / régulation P2 l'arrivée vers B10
samedi 30 juin 2012		Travaux Piste 06/07	100%	0%	Travaux seul 06 + retard mg TOBT l'arrivée ?		



Main issues

- ✓ Need to have reliable DATA ! => CDM Helps to consolidate it

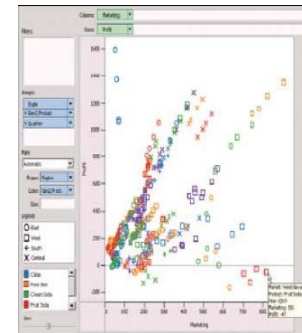
But

- ✓ Difficulties to measure the difference “before / After” CDM
- ✓ What are the good indicators to monitor, for who ?
- ✓ To many Indicators to analyze



⇒ New Tools (Big data, Datamining)

⇒ New HR profile (Dataminer)



- ✓ And need some time !!!



PERSPECTIVES

The Business Trajectory must be considered as a whole

TRYING TO SAVE 15 SECONDS IN « EN ROUTE PHASE »
MAKES NO OPERATIONAL SENSE
IF YOU HAVE TO WASTE 15 MIN ON THE GROUND.



Finish the on-going developments

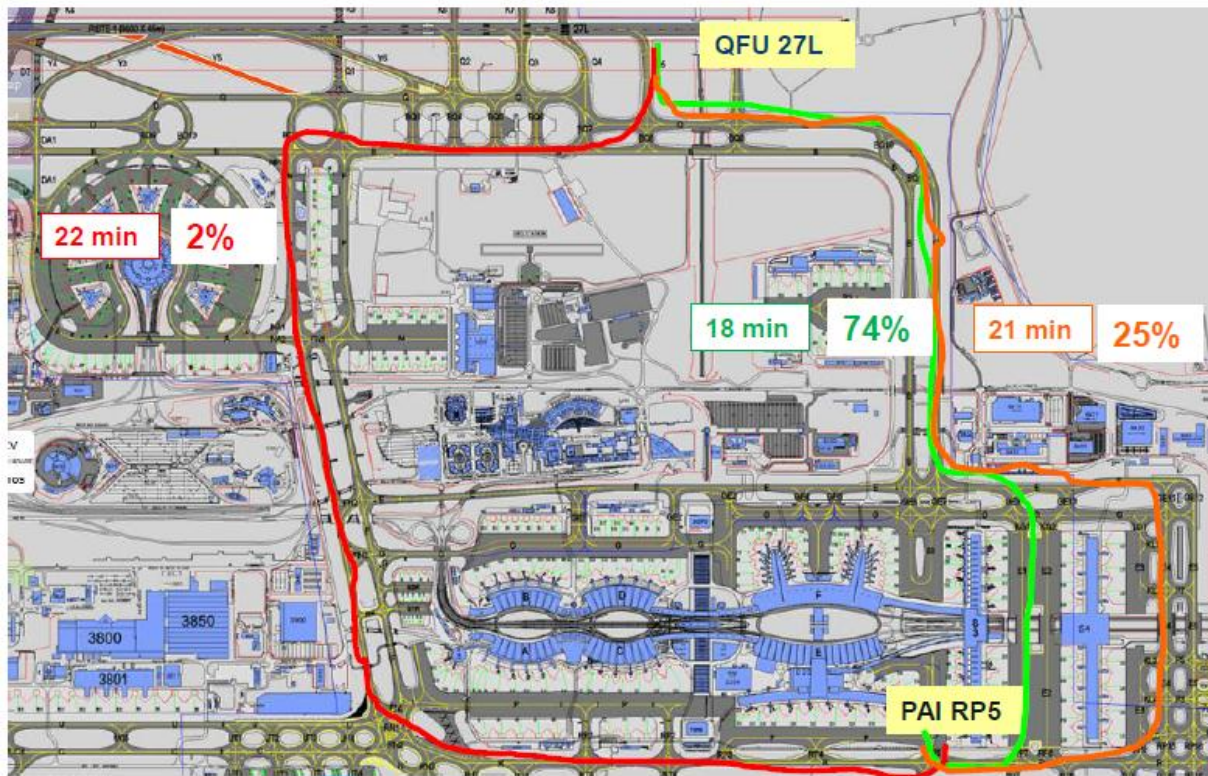
Next generation of Priority management

- ANSP : Short Term ATFM Mesures (STAM)
- CDM
 - Release strategy of aircraft parking stand (avoid local saturation)
 - Nature of flights : Passengers vs Fret
 - Short / Medium / Long haul

Finalize Load Runway Capacity Balancing Tool (Runway MANager)

Finish the on-going developments

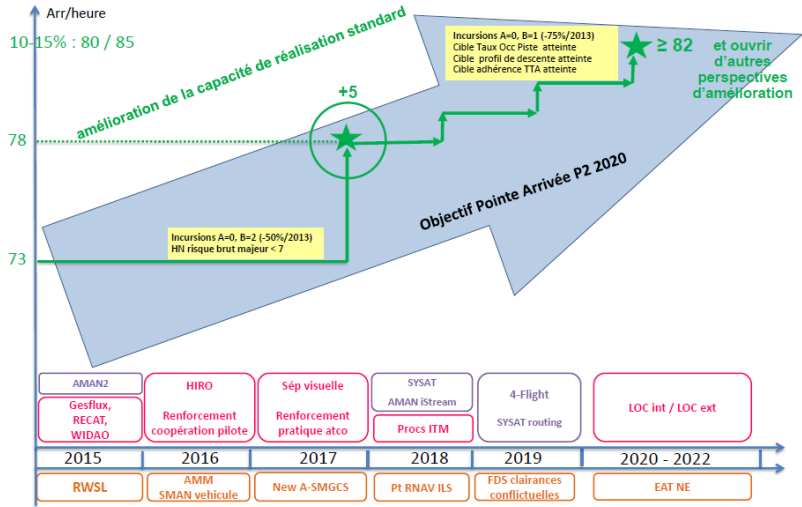
Improve TTOT by computing taxi-out time in real time



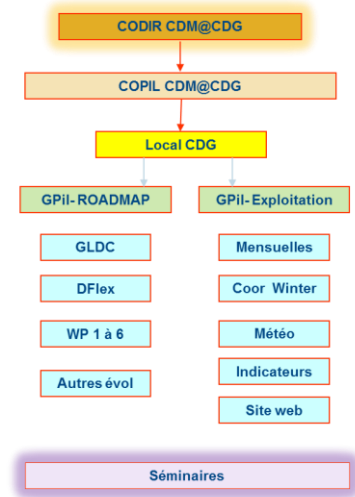


PERSPECTIVES

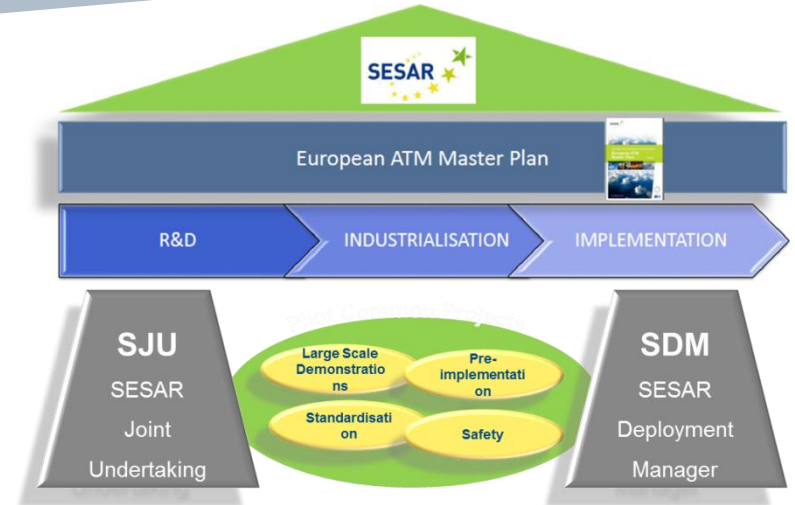
2 Drivers for a NEW ambition : CDG2020 / SESAR



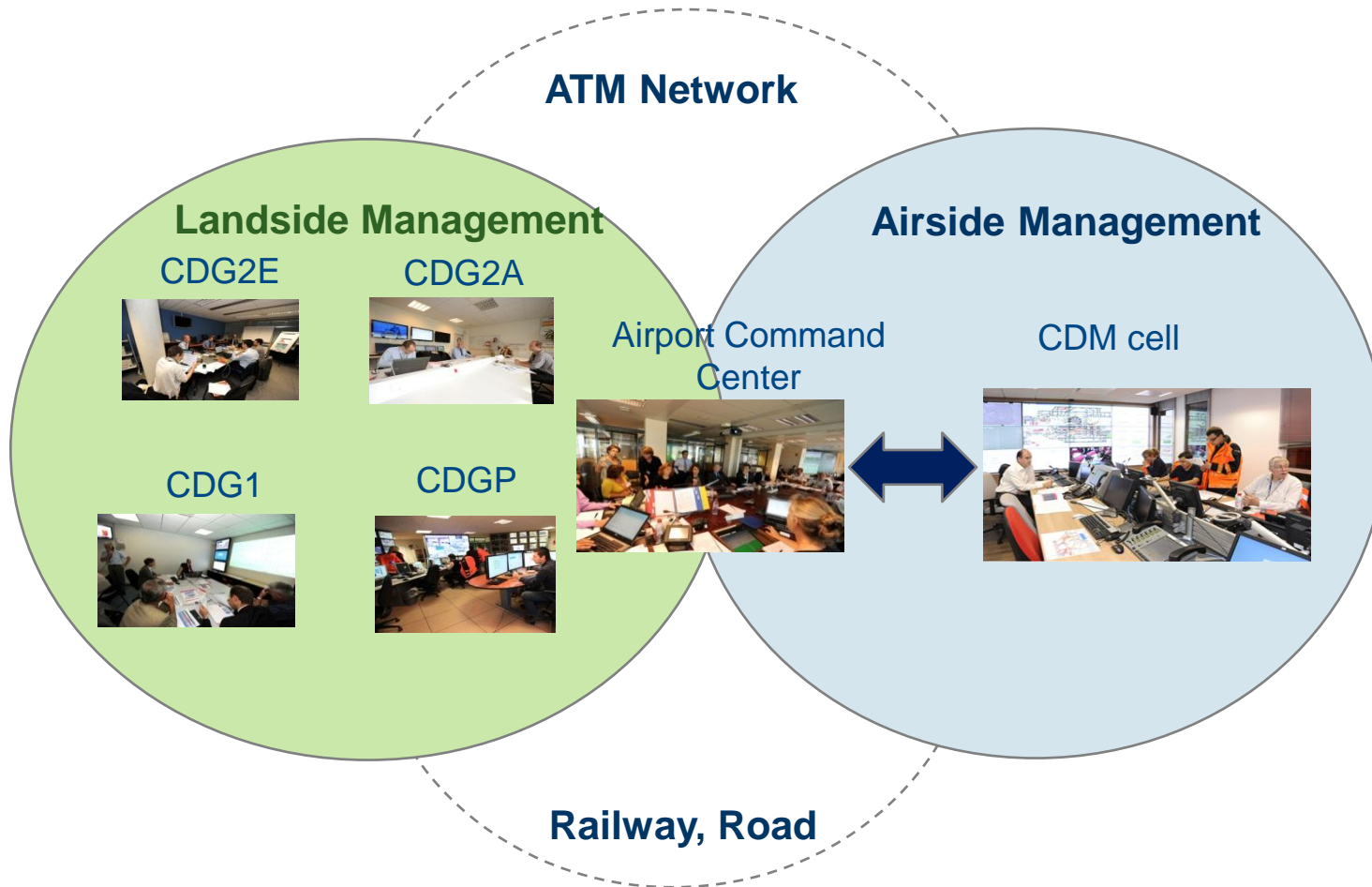
CDG2020 (Local)

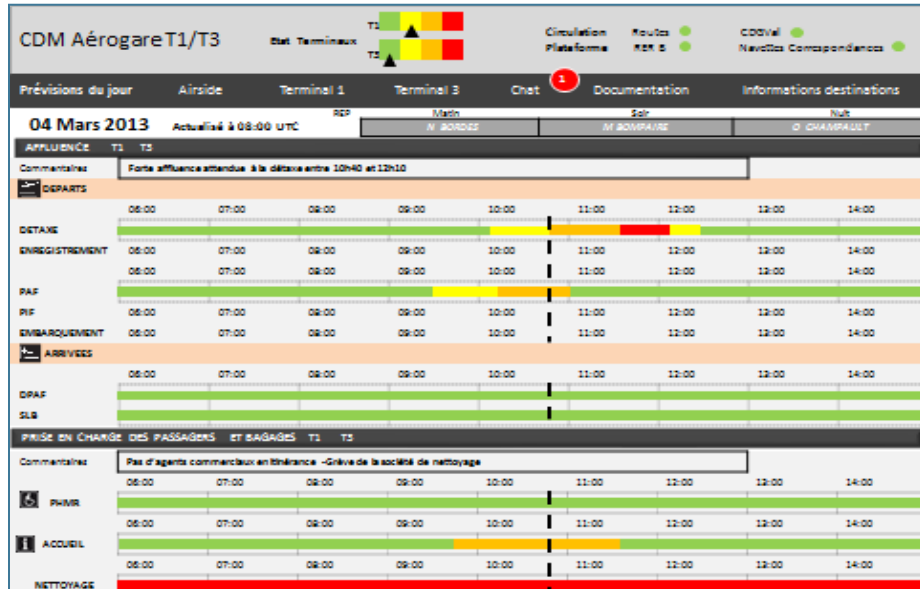


SESAR (Network)



... and develop TAM concept





CDM Terminal T1/T3

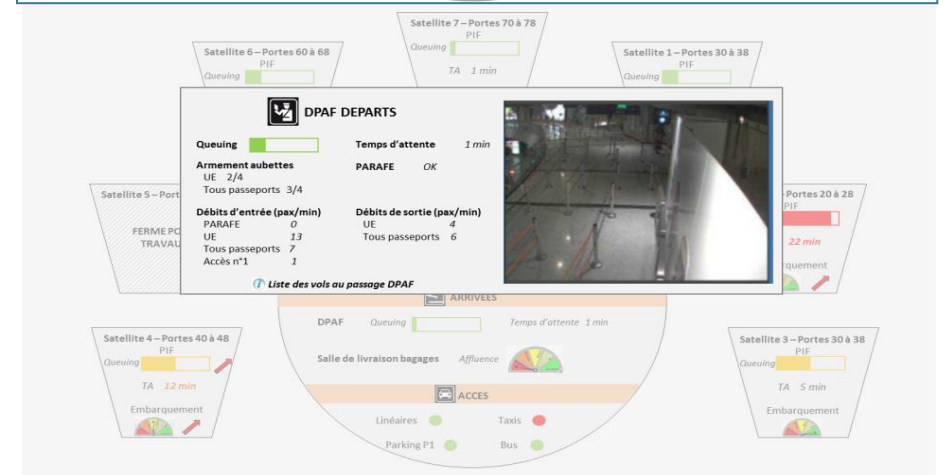
Traffic: Road Train

Daily forecast Airside Terminal 1 Terminal 3 Chat Documentation other information

A LA UNE Today 11:00LT Satellite 4 – Luggage left at the checkpoint n°4 Today 09:50LT waiting time : 3 minutes

AVANCEMENT DES VOLS AU DEPART – TERMINAL 1

Progress														
Cle	N°	Des	SOBT	Pax	SCH / INT	Hall	SAT	Check-in	Police	Security checkpoint	Bording	Turn around	TOBT	TSAT
LH	1029	FRA	10:40	93	SCH	4	6	100%		100%	19 (+2)		10:45	10:45
SQ	333	SIN	11:05	441	INT	1	3	100%	88 (-20)	110 (-30)	353 (-100)		11:15	11:15





Paris Charles De Gaulle becomes A-CDM on November 16th 2010



Some Figures

KPI		2010	2011
Threshold waiting time	-17%	240s	200s
Taxi-out Time	- 8%	17,5 min	16,1min
Departure Punctuality	+9%	70,5%	79,5%
Network Slot Adherence	+ 4%	81%	85%

Up to -40% during peak hour

Up to -4 min/flight in LVP for AFR



KPI	
Fuel burn gains	4000 T / year
Economic gains	3,5 M USD / year
Emissions reduction	13000 T / year
de-icing operations	
Record in 2013	420 ops in 1 day
	49 ops in 1h

AFR : Up to 6T/day



“A better management of our departure sequence flow, more particularly in constrained capacity period at night. Thus a reduced ground fuel burn overall, allowing us to save 210,000 gallons of fuel and 1,700 tons of CO2 emissions annually compared to the pre-ACDM era”



CDM Cell

✓ General strike (19 september 2010)

- 3355 minutes of delay avoid
 - Between 19:00-00:00 : 128 flights / +10 000 pax
 - Number of critical operations supported by the CDM Cell : 23 (18%)
 - Average gain per flight : 146 minutes
 - Stabilization of the average delay, despite the increase in slots
- No flight cancelled
 - All departures insured before 00:30

✓ Winter 10 (23 December 2010)

- All majors airports closed
- + 1000 flights operated in CDG
- 11 runways snow clearing operations
- 320 deicing operations

LESSONS LEARNT

S TRENGTHS



- Proximity with operational staff
- Strong involvement
- PM by stakeholder
- Goals understanding
- Responsibility
- Reactivity

W EAKNESSES



- Availability needs
- Communication needs
- Loss of confidence

Internal factors

O PPORTUNITIES



- Sharing information
- Data more reliable
- Collective and coordinated work
- Synergy & complementary
- Co-lead, Consensus and Challenging
- Synchronization

Positive

T HREATS



- New philosophy, Culture change
- Cost
- Fragmentation of efforts
- Maintain confidence between partners
- Trust
- Risk Management
- Failure

Negative

External factors



Think globally, Act locally !



+90% Positive opinion

Last CDG satisfaction survey (2013)

On behalf of China Southern CDG airport ,we are **very satisfied** about this new process, we noticed a strong improvement with the prior situation with raise and increase of punctuality of our daily flight rotation and specially our specials charter flights as ONU type the CDG is a real tool for our operations ,now we can feel and **trust** it to achieve perfectly our operations, **this knowledge is for us a good guaranty to work efficiently to aim our main target** : respect our schedule.

CDG IS A REAL AND RELIABLE PARTNER

“Thank you, Xièxiè CDMCDG”



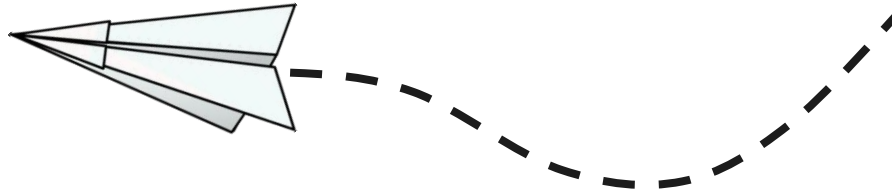
Luo Ming – China Southern representative

**中国南方航空
CHINA SOUTHERN**





Gracias



Fly Safe!

