

Snowwhite – a winter exercise for Schiphol Airport

In October 2006 for the second year in succession the National Aerospace Laboratory NLR organised a winter exercise to prepare airside operations teams from Amsterdam Airport Schiphol, KLM and Air Traffic Control the Netherlands (LVNL) for the forthcoming winter. The exercise, called Snowwhite, was carried out by connecting NLR's Air Traffic Control Research Simulator (NARSIM Tower) to a test version of the Central Information System Schiphol (CISS) and KLM's fleet management application and tow and pushback planning system thus creating a hub simulation facility.



Amsterdam Airport Schiphol during winter conditions

(source: Erik Sleutelberg)

Winter in the Netherlands

The geographic location of the Netherlands, close to the North Sea and the Atlantic, in combination with predominant south-westerly winds, usually imply mild winters. However once in a while, for instance as a result of Scandinavian high pressure, winter may strike heavily and unexpectedly. Under these circumstances the implications for public life may be quite significant.

This was the case early March 2005. Unpredicted and severe snowfall kept Schiphol Airport in grip of winter for several days. As a result the airport had to be closed for inbound traffic for a short period of time, and many passengers had to spend a night at the airport. The parties involved collectively evaluated these three winter days. Important causes of the experienced problems were the lack of de-icing capacity, sub-optimal snow removal at the stands and loss of overview of gates and aircraft.

Snowwhite - a winter exercise for Schiphol airport

Snowwhite

To improve the airside operation at Schiphol airport during winter circumstances, in summer 2005 under the authority of Amsterdam Airport Schiphol, LVNL and KLM, KNMI (Royal Netherlands Meteorological Institute), NLR started the development and organisation of a winter exercise called 'Snowflake'. Snowflake aimed to create a realistic simulation environment and winter scenario that could be used to effectively practice winter operations in a collaborative setting. The exercise took place in October 2005, serving as a refresher to collectively prepare airside operations teams for the coming winter. During the evaluation of Snowflake the parties involved concluded that a joint airside operations exercise should take place annually. The lessons learned during Snowflake provided the input for its successor, called 'Snowwhite'. Snowwhite were organised in October 2006 at the NLR premises in Amsterdam.



Snowwhite was organised for the following parties:

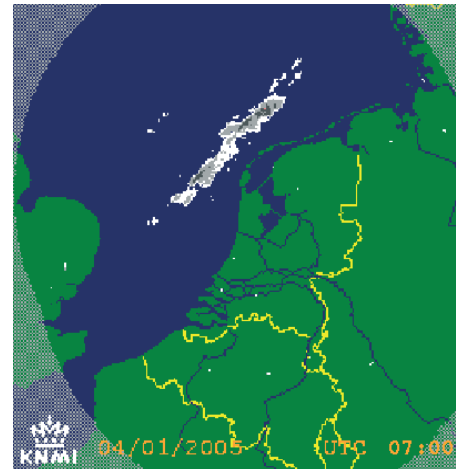
Amsterdam Airport Schiphol	Airside operations management, gate planning, apron control
KLM Ground services	De-icing and hub control
KLM Operations Control	Network control and co-ordination
KLM ATM	Flow control and flight dispatch
LVNL (Dutch ATC)	Ground & start-up control / delivery

Scenario

The four hour scenario for this exercise was directly derived from the situation of early March 2005. KNMI traced historical weather data and radar images, which provided the meteorological background of the scenario. The storyline stated that during the evening a wind shift, followed by unexpected snowfall and degrading weather conditions would strike Schiphol. This scenario firstly enforcing a runway change and a change of the operational plan. The snowfall put the required pressure on the de-icing process. A series of events (snow fleet needs refueling, trumps run out of de-icing fluid, aviobridge frozen fast, aircraft with technical problems after de-icing, etc) demanded the players to act adequately in accordance with the (new) winter procedures. The exercise was coordinated by the exercise manager, assisted by a large amount of exercise support staff, which represented all roles and functions that were or could not directly be involved in the exercise. To

prepare for the exercise the participants and the exercise staff received a briefing guide. Before the start of the exercise the exercise manager briefed the participants and the support staff and the meteorologist present provided a weather briefing.

Scenario statistics	
Number of flights (~3.5 hours)	Vehicles
- Inbound: 50	- 2 Snow sweepers (runways)
- Outbound: 60	- 4 Snow teams (platform)
	- 4 De-icing trumps

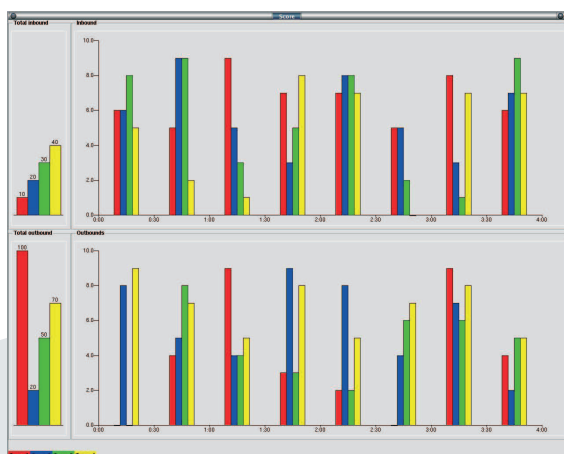


Simulation environment

The simulation environment was created by connecting NARSIM Tower to a CISS test server. CISS is Amsterdam Airport Schiphol's web-based flight information system that can run on any remote location. Installment of the web front-ends at the NLR premises provided airport staff and exercise support staff with flight information on the same systems they use in their day-to-day jobs. In addition KLM's fleet management system 'Planbord' was also made available for KLM Operations Control Centre staff. To facilitate tow and push back planning process NLR developed a copy of the KLM CHIP-system. To simulate the movement of tow and push back trucks in the exercise, the system was extended with an interface for the exercise support staff that simulated the work of all truck drivers in one working position.

To operate aircraft and vehicles six pseudo-pilot positions and two dedicated vehicle driver position were created. A weather system provided now cast and forecast weather data and corresponding radar images. To enable communications an extensive local telephone and R/T-network was set up. To include a sense of commercial pressure during Snowwhite a competition element was added. For each team the number of inbound and outbound flights were counted and captured on a visible

score board to compare the scores between the four exercise days (see figure below).



Statistics simulation environment

Number of workstations	35
- CISS:	18
- NARSIM:	17
Number of R/T points	20
Number of telephones	22

Evaluation and conclusion

The exercise outcomes have been extensively evaluated. Each organisation provided one or more observers, who gathered information on participant performance during the four days that the exercise was conducted. During the plenary debriefing sessions observer information was used to start discussion among the participants. Post-exercise questionnaires were used to gather participant responses to be utilised to improve future editions of the exercise. After the exercise Schiphol, KLM and LVNL collectively wrote a report to reflect on the specific operational objectives that were set. The lessons learned were directly integrated in the operational processes for the next winter.



De-icing of KLM aircraft at Amsterdam Airport Schiphol (source: KLM Ground Services)

Snowwhite and other exercises re-emphasised the importance of fast, complete communication between all parties involved. When it started snowing at the end of December 2005 – after the first winter exercise in October 2005 – the exercise appeared to be fruitful, on both the operating as well as the coordinating side. The teamwork between the parties involved went better than ever before. The airport remained open, whereas train and car traffic stood still (source: www.schiphol.nl).

The success of this project could be achieved thanks to the extensive open communication and collaboration with all parties involved, enabling NLR to effectively fulfill the role of integrator and facilitator in this interesting project. Another crucial factor was the ability to connect NARSIM and CISS, as such providing a realistic simulation environment for all participating staff.



Participants Snowwhite in NARSIM Tower

AT-One combines the strength of NLR and DLR in ATM Research

DLR

Helmut Többen
+49 531 295 2932
helmut.toebben@at-one.aero
www.at-one.aero

Contact
Telephone
E-mail
Internet

NLR

Luc de Nijs
+31 20 511 37 37
luc.denijs@at-one.aero
www.at-one.aero