



SCANDINAVIAN AIRLINES SYSTEM

AGIFORS

Crew Management Study Group

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Airline review

Scandinavian Airlines System

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A brief presentation of SAS

- SAS was formed in 1946 as a consortium consisting of the three national airlines of Denmark, Norway and Sweden. The respective states own half the shares, the remainder being in the hands of private interests.
- The SAS Group conducts passenger air transport operations (SAS Airline), freight operations (SAS Cargo), in-flight and airport sales (SAS Trading) and hotel operations through SAS International Hotels under the trade name Radisson SAS Hotels World-wide.
- SAS' main task is to offer competitive air connections within, between, to and from each of the three Scandinavian countries, partly using its own aircraft, and partly together with selected partners.
- SAS' vision is to make Scandinavians proud of their airline, and we want all our customers to want to fly with SAS again.
- The business concept is to offer the Scandinavian market a broad and profitable range of airline based services, focusing particularly on business travel. SAS prioritises absolute safety, maximum punctuality and excellent personal service.
- SAS traffic system is built up around non-stop routes to and from the Scandinavian capitals and offers its customers a global traffic system.
- SAS participates actively in the creation and development of Star Alliance™, the world's strongest airline alliance involving the partnership of Air Canada, Air New Zealand, All Nippon Airways, Ansett Australia Austrian Airlines, British Midland, Lufthansa, Mexicana de Aviacion, SAS, Singapore, Thai Airways International, United Airlines and Varig Brazilian Airlines.
- In the Scandinavian market, SAS offers an unbeatable network together with our regional partners AirBaltic, Air Botnia, Cimber Air, Skyways and Widerøe. SAS is able, via Star Alliance, regional partners and European partners British Midland, Spanair and Grønlandsfly, all three of which are partly owned by SAS, to offer more than 9,607 departures daily to over 815+ destinations in 130+ countries.
- In 2000, the SAS Group's operating revenue was SEK 47.4 billion (+8,7%) and its income before taxes was 2,773 MSEK (1,846).
- The average number of employees during 2000 was 30,959.

The Airline Fleet

A/C Type	2001
Boeing 767-300	13
A330/340 (from August)	4
A321-200 (from October)	3
Boeing 737-600/700/880	50
MD90-30	8
MD-81/82/83/87	67
DC-9-21/41/81	10
Total	155

Personal

Flight Crew	2.100
Cabin Crew	4.500

Crew Bases

CPH	Copenhagen, Denmark
OSL	Gardermoen, Norway
STO	Stockholm, Sweden



Airline update

Important events since the last meeting:

- SAS has launched timetable information via SMS.
- In cooperation with 12 other airlines, SAS has set up the airlines industry's largest internet-based marketplace for business-to-business commerce called Aeroxchange.
- The Members of Star Alliance™ have launched StarNet, a sophisticated IT solution that links the 15 airlines' computer systems with each other, which will benefit integration of the traffic systems.
- Mr. Jorgen Lindegaard, age 52, has been appointed to be the new President and CEO of SAS. He will take up his position on May 8, 2001.
- The three Scandinavian governments have announced their intention to reorganize SAS' share structure to a single share in a holding company.
- SAS has presented a multi-function card, SAS Corporate Card, which can be used as an electronic ticket and means of payment. The card is to be launched in spring 2001.
- SAS has signed an agreement with Telia and the U.S. company Tenzing Communications Inc. on cooperation concerning wireless Internet and e-mail on board aircraft.
- SAS starts a pilot study on using Blue tooth technology to offer air travellers flight information directly in their mobile phones.

Crew Management Systems update

IT Achievements

Since the last meeting focus has been on consolidating the new IT solutions introduced due to none Y2K compliant systems. A consequence of this is that several ongoing projects have been delayed. The following IT related projects has been implemented since the last meeting:

CORS – Cabin Operation Report System phase 2

- Additional functionality for generating reports and statistics and the distribution of reports.

CrewNet Phase 2 – Intranet version

- Additional functions has been introduced replacing the OS/2 finger-touch based Crew Service Screen
- The introduction of keyboard and mouse to Crew members was a “big step”, but the project was a success due to a very user friendly user interface.

Roster Simulation and Assignment tool

- Carmen Assignment System has been choose both as a Roster simulation and Assignment tool.

Carmen Pairing System version 7.0

- Implemented and accepted with good results

ACCI – Automatic Crew Check-In

- The OS/2 based ACCI back-office application has been phased out and replaced with similar functionality in the TAP system.



Current Crew Management Systems

SAS are using the following systems:

Process	System	Supplier	Technology
Manpower Planning	IRS	SIG ¹	NT, DB2, IBM M/F ²
Crew Records	CRU80	SIG	IBM M/F, IMS/DB2
Course Planning	CRU80/FDA	SIG	IBM M/F, Access
Pairing Planning	PAC vs. 7.0	Carmen	HP-UX
Roster Planning	GCA/Beast	In-house	HP-UX, Oracle
	CAS	Carmen	HP-UX
Roster Maintenance	TAP-AI	SIG	HP-UX, IBM MF, NT
Day-to-day	TAP	SIG	IBM MF, HP-UX, NT
Crew Check-in	ACCI	SIG	IBM M/F, DB2
Crew Hotel & Transp.	H&T/CRU80	SIG	IBM M/F, DB2, OS/2
Vacation Planning	SASVAC	SIG	UNIX, NT, Oracle, Web
Legality control	CRU80	SIG	IBM M/F, IMS DB
	RAVE	Carmen	HP-UX
Per Diem/Overtime	CMS	SIG	IBM M/F, HP-UX, DB2
Statistics/Reports	CMS	SIG	IBM M/F, HP-UX, DB2
Cabin Reports	CORS	SIG	IBM M/F, NT, Oracle
Crew communication	CSS	SIG	IBM M/F, OS/2
	CrewNet	SIG	HP/UX, NT, Oracle

Ongoing projects

As mentioned above some ongoing projects have been delayed due to various reasons. Currently SAS is working on the following IT related projects:

CLS - Crew Legality Services project

- The project is further delayed due to lack of IT resources, additional change requests, and an extension of the test periods
- The revised time schedule for implementing the following deliverables is medium September 2001:
 - a single HP-UX Rule Server concept based on the RAVE product from Carmen Systems, featuring new Legality, Composition Check and Roster Up-load HP-UX Servers
 - a common legality control system, that utilises a centralised updating facility supporting all systems
 - a replacement for the CRU80 Legality and Composition check modules
 - a event driven architecture
 - an integration the concept with SAS current Crew Control System (TAP)
- Some of the business effects are:
 - ensure shorter turnaround for rule changes
 - cutting down operation and maintenance costs
 - ensure simulation and consequence analyses of changes to union agreements and rules in all systems

CrewServices

- Converting the existing Web based CrewNet application into a new common Portal for all employees
- Introducing Internet access for Crew members
- PDA facilities for crew list and roster access and Cabin Reports reporting for Air Pursers
- An electronic questionnaire facility to collect quickly feedback from Cabin Crew on new products, procedures, standards etc.
- Converting of the existing Crew vacation bidding system

¹ SIG = Scandinavian IT Group (before this SDG or SAS Data Group)

² IBM M/F = IBM OS/390 Mainframe



CAS – Carmen Assignment System project

- After a long vendor evaluation process SAS has finally decided to implement the Carmen Assignment System as a replacement for the old in-house developed GCA/BAEST (SEMI) systems.
- In order to get faster business effects regarding crew productivity, SAS has decided to divide the project into two phases:
 1. the CAS system is used only for automatic optimisation purposes and any pre and post assignments are done using the current GCA system. A limited legality rule set developed by CARMEN is used
 2. both pre and post assignments and the automatic optimisations are done in CAS using SAS' own Legality rule sets
- The Time Schedule is as follows:
 - Phase 1 is ready, and the first flight deck roster for DC-9 pilots was released 22nd March. The first Cabin Crew roster for OSL based crew is planned for release 3rd May 2001
 - Phase 2 – SAS is awaiting a detailed plan from Carmen, but the goal is to phase out the current assignment systems by the end of the year.

• **PBS - Preferential Bidding System project**

- SAS has even decided to implement the Carmen Preferential Bidding System.
- The project is in the initial phase and both Cabin and Flight Crew Unions are involved.
- The plan is to introduce the system after the CAS System is final implemented and accepted some time during the first or second quarter of 2002.
- SAS also plans to introduce monthly rosters as of today were 14 days rosters are released every two weeks.

• **TABASKO – Crew Execution system**

- The project has been on hold for some time, as SAS are extending the scope to include the whole traffic execution process incl. Crew, Air Craft and Technical Maintenance
- Functional requirements using Use Cases for re-assignment, tracking and day-to-day Crew control functionality (incl. Preferential bids and co-planning of Cabin and Flight Crew) has been defined
- The technical requirements are state of the art requirements (OO and Corba)
- A Request for Proposal process is pending on additional requirements (use cases) and a final senior management decision.

• **CDRS – Common Deviation Report System**

- SAS Management need measures in order to improve the aviation authorities' confidence in SAS Flight Safety Program.
- A Common Deviation Report System - handling all deviation reporting from flight crew, station staff and technical maintenance staff, including tools for investigations, statistical reports, and how to collect and process the data is under development, and is planned to ready for acceptance test June 2001.
- The final project is expected to deliver a system to deal with deviations in a process-oriented way and the business effects are as follows:
 - Decrease the likelihood of a reoccurrence of deviations
 - Increased willingness to report deviations
 - Increased possibility for fact and process oriented decisions
 - Reduced costs by avoiding development and maintenance of multiple systems
 - Reduced costs due to labor when handling the system
 - The system is also expected to be an important tool in SAS' efforts to improve the company's safety culture and to strengthen our capability to identify risks and prevent unwanted occurrences.

• **CHATS – Crew Hotel And Transportation System project**

- SAS has started a project to define requirements (use cases) for a new system supporting the Crew Hotel and Transportation process from long term allotment planning to invoice control.
- The requirement phase ends end of May 2001.
- SAS expect to sent out a RFI to different vendors after input from this years AGIFORS Meeting.
- A new system is replacing two current systems (H&T from 1991 and a CRU80 reports form 1984).



The future – planned activities

- Dynamic simulation support
- Flight Duty Allotment and Training Planning and Allocation System
- Crew Meal Load system support
- Key Performance Indicator system (Key figures)
- Future Flight Planning System
- Digital Manual Services (Web-based)
- New integrated Manpower Planning Systems