Administration de la Navigation Aérienne (ANA)

LE GOUVERNEMENT
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et des Infrastructures

Administration de la navigation aérienne

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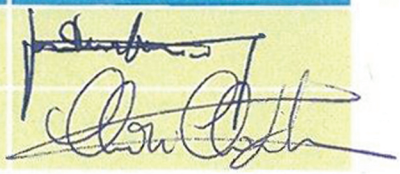
ANA	John SANTURBANO Director ANA	14.09.2017	
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FOREWORD

This report looks back to the actions and achievements from July 2016 to June 2017. In some areas the reporting period is the calendar year (i.e. finance, traffic figures, safety).

ANA is active in two areas: Air Navigation and Aerodrome Services.

1 – ANS Provision

- **ANS Performance**: ANA managed a traffic increase of 6,8% - substantially above the STATFOR BASE forecast - whilst service units rose by 11% in 2016.
- **Safety** occurrences of ground based incidents maintained at a low level.
- **Capacity** of the airport has proven to be sufficiently high despite traffic growth.
- **Cost-Efficiency** in the ANS provision is in line with EU wide targets in En Route services with Belgium and the effective TNC unit rate could be further lowered.
- **Environment** impacts have not further deteriorated despite the traffic increase; ANA has implemented eight Continuous Descent Operations procedures. The trials are ongoing.
- **Security** of service provision has increased with better controls and further tools implemented and security procedures aligned.

ANA is compliant with SES regulations and operates a performance and charging scheme that satisfies our stakeholders in all predominant areas, with the prime focus on safety and costs.

2 – Aerodrome Services

- **AER Certification**: ANA continued in the assigned role as the leading party for the certification of the aerodrome during 2016.
- **Safety**: ATM occurrences and bird strikes are at a low level; most airport occurrences (RWY / TWY incursions) are caused by GAT.
- **Obstacle** clearance is achieved on the airport; the airport environment terrain and obstacles are subject to a full TOD survey.
- **Airport Incidents** are managed by the fire brigade and rescue service SIS which continued to prepare for meeting the EASA requirements as part of the certification and adopting its services to operational needs.
- **Airport Capacity** and continuity of operations following work in progress on the manoeuvring area was maintained; the winter service was performed well.
- **Airport Environment** was maintained with regard to grass management and wildlife protection and preventing wildlife incidences; care is taken to protect the environment from unnecessary impacts from de-icing and RWY treatments.

A strategic initiative started in 2014 by MDDI and ANA with the aim to be more cost-efficient and look for business synergies with FABEC partners was successfully closed in autumn 2016.

The Ministry received the cost-to-benefit analysis and the offers and took the following decisions

On ANS:

– ANA remains the competent ANSP in Luxembourg and provides approach and aerodrome control services in Luxembourg airspace and on the airport.
– ANA agreed a long-term technical and operational cooperation with DFS in all CNS areas starting with first installations in 2017.

On AER:

– ANA hands over the role as the Aerodrome Operator to lux-Airport and continues to contribute to the certification work as the ANS and AER service provider.
– ANA continues to provide the aerodrome services as the manager of the technical and operational aerodrome environment.

All next-years actions related to the decisions and initiatives are laid down in the **Annual Plan 2017 – 2018**.

This report also analyses the outcome in view of the ten Strategic Axes set out in 2014.

The long-term impacts and strategy are more profoundly analysed and concluded in a new strategy, mission, vision, goals and objectives described in the now released **Business Plan 2017 – 2021**.

I thank all staff and heads of departments for the good results achieved in challenging times.

My thanks also go to our stakeholders and partners in business who delivered their contributions as promised.

John Santurbano, Director ANA

EXECUTIVE SUMMARY

This Annual Report covers the activities and results during the time period from July 2016 up to end of June 2017 of ANA, the Provider of Air Navigation Services (ANS) and the Aerodrome Service provider (AER) at Luxembourg Airport.

This activities, developments and results achieved from 2016 to 2017 are reported in comparison to the Annual Plan for the same period as required by SES Regulation.

Scope

This report gives information on ANA's:

- performance in ANS provided;
- performance and progress in AER;
- performance as an ANSP in comparison to the performance indicators and targets in the 2016-17 Annual Plan;
- progress and performance in technical and operational areas CNS, ATC, AIS and MET;
- progress and achievements in the project portfolio of the PMO;
- policies and processes in the human resources domain;
- progress and changes in the finance management and the financial results for the year 2016.

2016-17 Strategic Initiatives

Ten major initiatives were set with respective targets to be achieved in 2016 in all key services:

1. Develop synergies and cooperation with partners in FABEC;
2. Apply modern technology where it offers benefits;
3. Increase efficiency and safety of ground movement;
4. Use European central services and common infrastructure solutions;
5. Optimise ANA services in line with requirements;
6. Apply measures to reduce environmental impacts and footprint;
7. Develop a common purchasing policy with partners in FABEC;
8. Create effective working conditions and work environment in ANA services;
9. Adapt manpower planning, recruitment and training of staff in line with competence demands;
10. Achieve the certification of the aerodrome in compliance with the new EU regulation 139/2014 and related guidance material.

ANA has put efforts in selected priority work items of this strategic axis in the last reporting period:

- **ATC** – successful implementation of A-SMGCS level one;
- **CNS** – start of a longer-term technical collaboration with DFS for a complete renewal or replacement of system hardware and software;
- **AER** - aerodrome certification preparation continued with a change in role as the Aerodrome Operator (AOP) from ANA to lux-Airport;
- **AIS** – launch of a survey for electronic Terrain and Obstacle Data (eTOD);
- **MET** – implementation or replacement of tools and measures to provide aeronautical and non-aeronautical MET services.

Fig. i provides an overview and status in regard to the strategic projects related to the SYNergies project.

Performance results

Safety: In the Key Performance Indicators (KPIs):

- Effectiveness of Safety Management (EoSM) further improved and targets achieved;
- ANA maintained the high level in the application of Risk Assessment Tool RAT to ATM ground (100%), ATM-SE and reports on all relevant occurrences;
- ANA has further improved in its Just Culture – remaining actions are not in the hands of ANA;
- the number of ATC related incidents remains at a low level;
- safety critical equipment failures in CNS, ELE and MET maintained at low levels.

Quality: Internal and external audits. Internal QM structures, quality trainings and regular QM meetings at departmental and at ANA management level are held. The Integrated Management System is documented and maintained, performance management and reviews are organised and performed.

SES compliance

The **Performance Plan** (PP) was updated for the 2016 monitoring exercise (EU 391/2013).

Security – a security system is in place, defined and mapped against legislation and new tools and procedures have been implemented (EU 1035/2011).

CNS – step-wise changes started in 2016 to adapt the structures in CNS. In spring 2017 the complete upgrade of the current Surveillance (SUR) system is decided.

Finance – starting in 2016, continuous efforts led to improved structures, better processes, procedures and tools which are now (end June 2017) in use in the Finance Department and enable new features in cash flow tracking, accounting, budget planning, execution and controls. The

monitoring of the performance plan, the charging scheme and revenues have greatly improved.

Projects: Seven projects (out of ten planned to be completed) could be completed in 2016. Through better tracking and control, actual project costs were 13% below planned costs.

In 2017 Q1 / Q2 project management was busy with establishing the collaboration agreements with DFS and Belgocontrol. The planning of the RWY refurbishment work with PCH is ongoing.

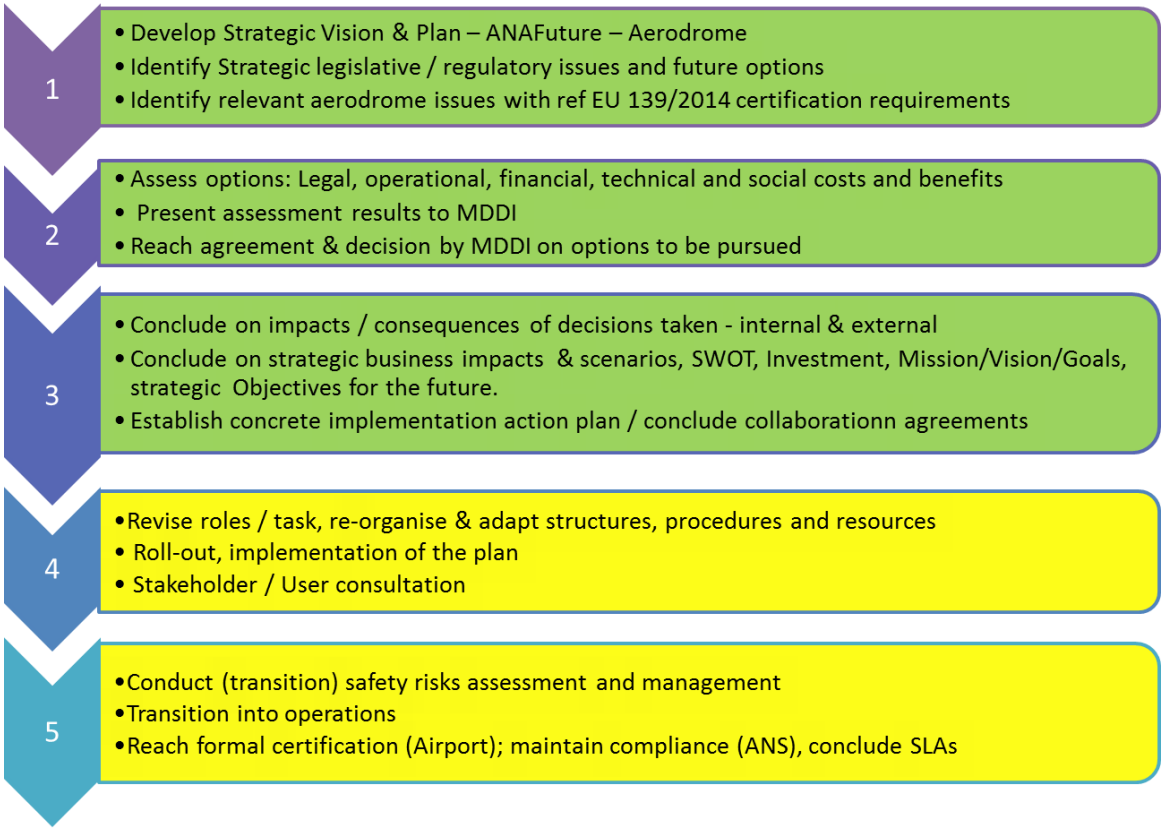

Figure i – 2016 Strategic vision and action plan (Status: June 2017)

Note: Green = finished; Yellow = ongoing / not finished

PERFORMANCE 2016

Performance framework

The outdated Business Plan (BP) 2013-2017 is now replaced by a BP 2017 – 2021. However, the Annual Plan 2016 - 2017 (AP) is the main basis for the performance reporting in this report[1].

Objectives: The main performance objectives of ANA for 2016-17 were:

- Set new targets and actions in all performance areas;
- Maintain and improve performance in all performance areas;
- Continue and achieve the performance targets set in the 10 strategic initiatives.

The main objective in strategic terms was the finalisation of the Cost-to-Benefit Analysis (CBA) of the launched SYNergie initiatives with FABEC partners by the end of February 2017. This was followed by an extensive analysis of the decisions taken at high level and concluding on strategic consequences.

ANS Results 2016

The website of ANA provides news and information on all services, traffic, freight and passenger statistics[2].

The site also provides information on environmental programmes, achievements and their status.

Tab. 1 (see next page) summarises the traffic, passenger, freight and traffic service units[3] evolution since 2011 and compares the years 2015 and 2016.

Traffic evolution: The result of ANS related activities for the year 2016 compared to 2015 shows an increase in total flights[4], an increase of transported freight[5] and passengers.

This trend continues in 2017 as the Q1-Q2/2017 figures indicate.

The number of local flights has further decreased. For the overall trend see Fig. 1.

One can conclude that more traffic of bigger aircraft with an increasing load were handled by ATC.

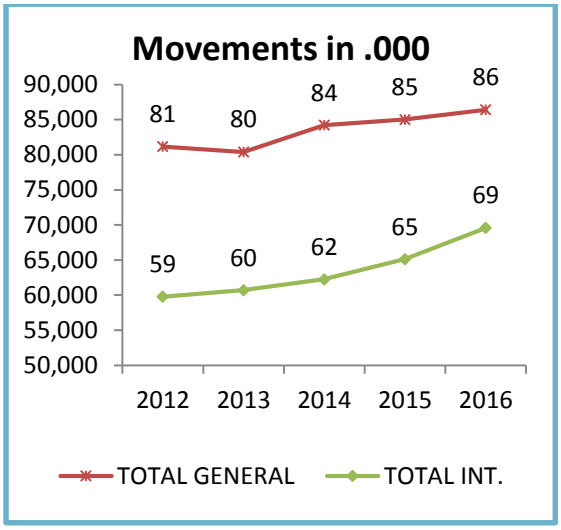

Figure 1 – Luxembourg movement statistics 2012-2016

Passengers: The upward trend since 2012 continued and passenger numbers are further up by 12,5% to a total of more than 3.0 million. Whereas the number of international movements has increased by 6,83%, passenger airlines are filling their available capacity better in 2016 compared to 2015 and operate bigger aircraft (as the increase in traffic service units indicates).

The trend towards increasing passenger load / aircraft is also reported by other airports.

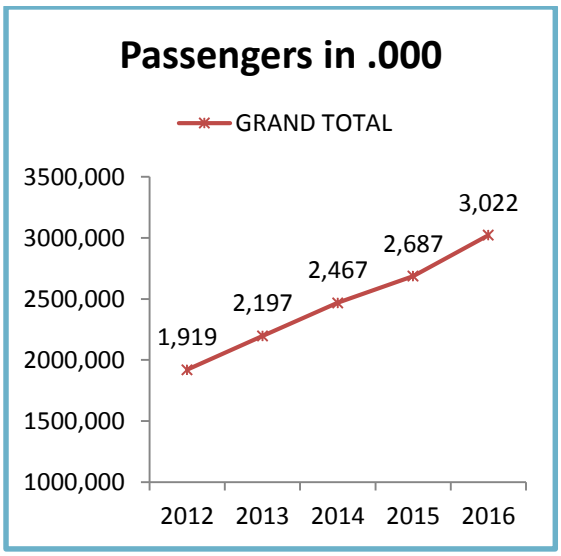

Figure 2 – Luxembourg passenger statistics 2012-2016

Freight: The freight handled increased by a high 8,71% to 802 426 tons. The industry-wide trend forecast had for 2016 predicted a slowing down of

1 ANA (2016) Annual Plan 2016-17, Version 1.0.

2 http://www.ana.public.lu/fr/index.html

3 Traffic Service Units as per Regulation based on the Formula Max. Take-Off Weight (MTOW)/$50^{0.7}$; no figures available for 2011 – 2013.

4 Combined scheduled, non-scheduled and business

5 Combined freight and postal transport

freight transport. This forecast is not confirmed for Luxembourg airport 2016.

The planned extension of the Cargo Centre and P7 apron show the commitment of the airport to air cargo development and highlight the importance of this economic sector for Luxembourg.

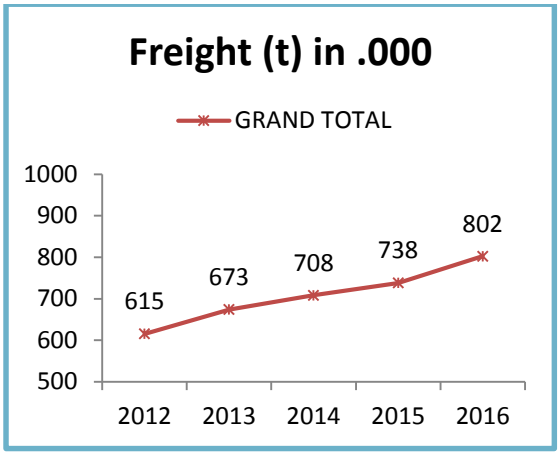

Figure 3 – Luxembourg freight statistics 2012 - 2016

Night flights: From January to December 2016 (incl.) a total of 1.991 passenger and freight night flights were handled (between 23:01 – 05:59hrs) of which 1.305 (two-third) departures or arrivals were during the last hour of the day (23:01-23:59 hrs).

The total number of night flights increased from 2015 to 2016 (year-to-year end) by about 10%.

A total of 1.273 cargo flights departed or arrived during night hours accounting for 64% of all night flights.

Table 1 - Traffic[6], freight and passenger statistics 2011-2016 and changes (increase) 2016 – 2016

Year	Total commercial	Total international	Total local	Total mvt overall	Total passengers	Total freight (t)	Traffic Service Units[7]
2011	53 854	59 999	23 406	83 405	1 791 231	656 651	NA
2012	54 168	59 785	21 378	81 163	1 919 694	615 905	NA
2013	55 316	60 727	19 670	80 397	2 197 331	673 500	NA
2014	56 906	62 260	21 962	84 222	2 467 864	708 078	NA
2015	58 119	65 128	19 913	85 031	2 687 566	738 136	41 083
2016	55 615	69 577	16 825	86 402	3 022 918	802 426	45 676
Change 2015 - 16	**-4,3%**	**6,83%**	**-15,50%**	**0,96%**	**12,50%**	**8,71%**	**11,18%**

[6] Traffic movements (mvt)

[7] Service Units (SU) = charged TNC

PART A

ANA ANS / ATM SERVICES

SAFETY PERFORMANCE

The Safety Management function in CERT (former SMU) is responsible for the safety issues and managing the safety work in ANA as the ANSP.

Regular Safety Committee meetings between the safety management structures in place in ATC, CNS, MET and ELE ensure close contact, information exchange and coordination of all safety and quality items.

The SAF targets and actions are reported during the annual KPI and management review meetings (April, 2017).

An annual Safety Plan is set up in the Annual Plan (AP); the results for 2016 are reported in Annex 2.

This report uses the latest available KPI / PI and target and achievement information as well as the specific performance actions applicable for this report[8].

EU Safety performance indicators & targets

The end 2016 (European and respectively FABEC) KPIs and targets and the level reached is reported in level reached and in %[9]:

- Effectiveness of Safety Management (EoSM) Target: Reach Level 3 (C) in all management objectives.
  - Results: (see Fig. 4 and Fig. 5) **Targets partially reached**

    Note: EoSM is measured by verified responses to a questionnaire at State, DAC and ANA level.
- Classification of Severity of ATM Occurrences Target: Apply Risk Assessment Tool (RAT) to ATM ground occurrences and ATM-SE related to operational and safety functions
  - Results: **Targets reached**
- Just Culture reporting Target: 20 items out of 24 on `Yes´
  - Results: **Target reached[10]**.

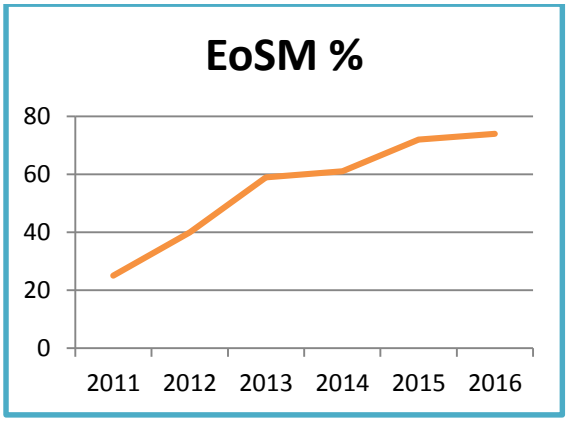

Figure 4 – ANA EoSM improvement trend 2011-2016

Figure 4 depicts the EoSM trend since 2011; for comparison reasons the score for 2015 is expressed in % based on the former scaling (RP1). The improvement is close to 2% from 2015 – 2016.

Note: EU / FABEC targets on safety are coordinated and agreed in FABEC Safety SC.

As regards RAT application, it was decided that only ATM-SE occurrences having an effect on OPS and an impact / potential impact on a safety related function on OPS should be scored. ´Loss of redundancy´ and ´loss of supervision´ are not in the scope of the regulation.

Local PIs and targets as laid down in the SAF KPI are coordinated and monitored in the ANA Safety Committee which also takes corrective actions with the respective safety officers and heads of department.

Fig. 5 below shows the EoSM scores in 2016 for ANA.

[8] This applies to all departments and respective chapters in this report.

[9] The % scale was in use until 2014 and is reported here to maintain continuity with the scoring. The official scale is the level scale in accordance with the revised EASA formula (in use in FABEC Performance Plans).

[10] Status quo is unchanged since 2014 as remaining actions (4) are outside of the scope / reach of ANA.

ANA EoSM results 2016 by Management Objectives / FABEC 2019 Target

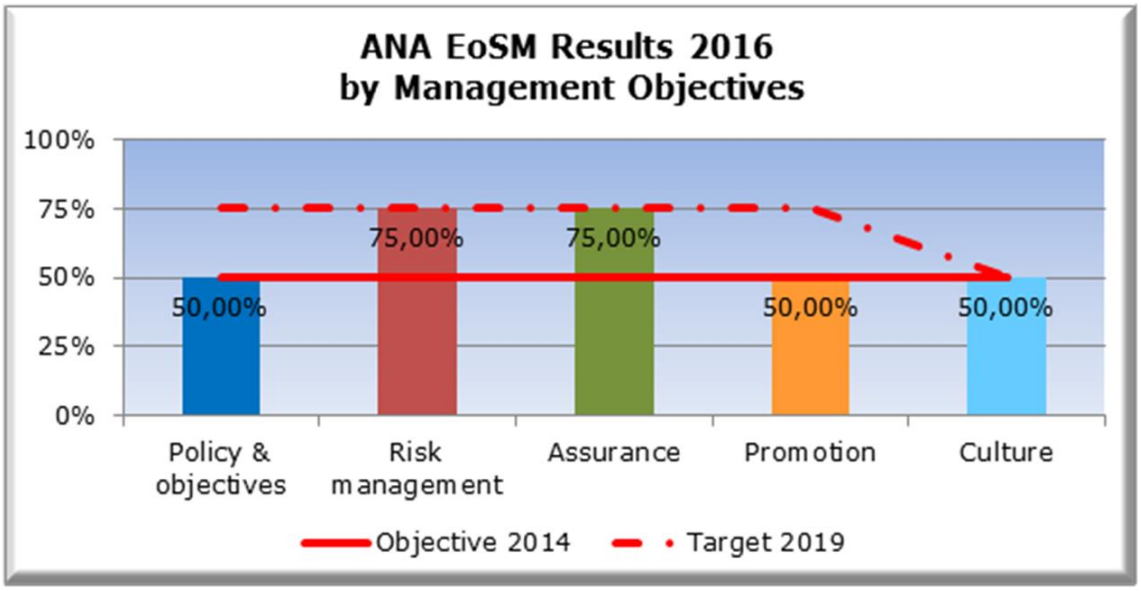

Figure 5 – Results (achievement scores) in the EoSM questionnaire for ANA (ANSP level) in 2016

The results achieved in the EoSM indicate improvements in the coordination of emergency response and contingency planning, in the management of safety interfaces and in safety culture. More actions are planned and will be finished by end 2017 in regard to safety training and the measurement and improvement of safety promotion and culture.

Safety work

The SMU is involved in all safety assessments to verify that the correct process is followed and results are sensible and valid.

Safety assessments are a normal part of projects that do or may affect safety. The SMU provides and adapts templates and documents in support for this work.

During 2016-17 SMU was involved in the following major projects[11]:

- A-SMGCS and all related projects; the Software Safety Assurance (SSAS) and the Site Acceptance Test (SAT) were successfully performed in 2016 and in June 2017;
- AWOS/ATIS software update safety activities;
- Surveillance chain upgrade safety activities;
- Continuous Descent Operations (CDO) safety activities;
- Replacement of the Radio back-up system safety activities.

Annual Safety Plan

The last plan against which the performance of the safety work done in 2016 – 17 is measured is published in the Annual Plan (AP) 2016-17[12]. The plan lists a number of objectives and activities that ANA planned to achieve.

Annex 2 provides a detailed update of the safety achievements as by June 2017.

The results show that a number of actions achieved / completed on time. Most actions concern continuous activities.

Audits & Corrective Action Plan (CAP): The following audits were held and actions implemented in 2016-17:

- *Contingency Plan audit* – the audit in conjunction with the ANA contingency plan went without a noticed NC or Observation;

[11] See project list in Table 17 for further details.

[12] See Annex 4 in ANA (2016), ANA – Annual Plan 2016-17. Luxembourg: ANA

- *Security audit* – the common requirements for security (EU 1035/2011) were checked and some findings were closed by DAC;
- *SSAS implementation* – Corrective action plan has been implemented;
- *SMS, ATFM and ATSEP competence audit* – NC and observations have been closed by DAC;
- *Occurrence reporting audit* – NC´ and observation were closed by DAC;
- *Recertification of ATC training organisation ATS working methods and SERA audit* – corrective action plan has been defined and some corrective action already implemented;
- *Interoperability audit* – corrective action plan has been defined and some corrective action already implemented;
- *Specific requirements for AIS / MET and CNS audit* – corrective action plan has been defined and some corrective action already implemented;
- *Implementation of (EU) 376/2014 audit* – corrective action plan has been defined;
- *SMS and ATSEPs competency audit* – corrective action plan is under definition;
- *EASA undertaking compliance audit* – corrective action plan has been defined

Safety Management: The Safety Management Unit (SMU) participates in all internal management meetings and monitors safety related activities of ANA.

The most important internal meetings for SMU are

- *SMT – Strategic Management Team* where ongoing projects and activities are monitored, decided and corrective actions are taken;
- *Safety / Quality officer meetings* to address occurrences, potential threats and latent conditions;
- *Management reviews* to report, exchange and revise performance processes run by Quality Manager (QM);
- *Project review meetings* run by PMO;
- *Safety Committee* meetings run by SMU;
- *ADIM Meetings with DAC*.

Safety KPI development: ANA has set

- safety performance indicators and targets for safety related incidents in ATC and
- for safety related technical impacts on ATM from CNS, MET and the Electro-technical Service (ELE).

These incidences are monitored and followed up on by the departments in close cooperation with SMU.

The results on departmental safety indicators are reported in the chapters on ATC, CNS, MET, ELE and AER.

ESSIP - Safety Objectives achievements in the 2016 reporting cycle

Table 2 summarises the results in regard to the Local Single Sky ImPlementation Plan (LSSIP) implementation actions during the 2015 cycle in the European Single Sky ImPlementation (ESSIP) programme in safety related Objective SAF11.

Table 2 – ESSIP Safety Objective Status 2016

ESSIP OBJ	2016	Performance Gap
SAF11 - Improve RWY Safety by preventing RWY excursions	Luxembourg airport is late in implementing this OBJ. Several actions have been implemented in accordance with Part 3 (ICAO) requirements. However, some actions are still pending implementation by the ANSP (ANA) and by the Airport Operator (lux-Airport) and will only be resolved in the process of airport certification.	LATE Performance gap still open.

With respect to SAF11 (and also to AOP03) the Luxembourg Airport Airside Safety Team (L-AST) deals with operational safety issues and involves all airport partners at working level.

The AER Steering / Working Group works on the infrastructure and other certification items related to these ESSIP Objectives.

Efforts to increase safety competence and performance

Aerodrome: Progress on aerodrome training and competence is reported in the Aerodrome Part in this document.

Safety training: A safety training programme is in place and is followed for staff in accordance to their duties as safety officers / deputy safety officers.

The Safety training programme of ANA from July 2016 to June 2017 lists the following items (days/ number of trainees):

- Introduction to safety, quality, security and project management for newcomers (1 /15);

- ATM Software safety assessment SAF-SW (5/1);
- Aerodrome resource management – Runway safety APT-ARM (5/2);
- ATM occurrence reporting and investigation tools SAF-Tools (5/2);
- Practical safety assessment SAF-SA2 (5/6);
- ATM occurrence investigation and analysis SAF-INV (5/1);

Continuation / advanced training:

- EASA Basic Regulation 216/2008 – training (2/1);
- ATC (2/1);
- GNSS (5/1);
- Human Factors for ATM Safety Actors (5/2).

ATC PERFORMANCE

ATC (APP & TWR) safely handled 6,8% more international traffic in 2016 compared to 2015 with 12,5% more passengers and 8,7% more freight. The increase in passenger and freight load is visible in the more than 11% increase in traffic Service Units (TSU). Local flights wentdown by 15.5% (# of movements).

The main targets for ATC in 2016-17 were (as stated in the Annual Plan Strategic vision and initiatives table):

- A-SMGCS finalisation of Phase 1 implementation plan and start of operation at Level 1; preparation of Level 2 implementation;
- resume all operational related planning for training and competence assessment after high level decision regarding APP (not to be delegated to DFS);
- follow up and support related infrastructure implementation actions after decisions;
- implement FABEC airspace (SWAP) related changes if any are decided;
- develop, implement and trial of Continuous Descent Operation (CDO) procedures;
- continue exploration and planning of further synergies with FABEC partners in regard to training / cross-training of ATCOs and apron personnel.

Details on the progress are given in the following paragraphs.

Strategic initiatives and projects

A-SMGCS implementation of Phase 1 was finalised; shadow operations started in early 2017 as planned. The system is in operation since the end of July 2017.

APP SYNergie project support: ATC was involved and contributed as planned to the project with Belgocontrol and DFS. The high-level decision in late 2016 to continue the APP service by ANA demands a resuming APP training and competence activities and planning of resources.

ATC infrastructure – the high-level decision also led to a situation that required to urgently resume the pending Surveillance (SUR) chain upgrade. The related contract with the supplier was let in Q2 / 2017.

The decision and agreement to establish a cooperation agreement with DFS on CNS renewal / replacement includes a number of ATC related projects. This work will start in 2017.

FABEC projects: The SWAP and most of other projects are still frozen; there were no activities in the reporting period in FABEC projects.

Obstacle data: ANA acquired the obstacle data for the CDO based on the initial design study done by Belgocontrol. A new Memorandum of Understanding (MoU) was signed with Belgocontrol.

The **ATC training** centre worked on the recertification of the ATC training organisation in line with EU Regulation 340/2015 against new or revised requirements in preparation for an audit. The corrective action plan has been defined and some corrective actions were already implemented (see SMU chapter).

New VFR procedures in compliance with ICAO were designed, approved and put in operations in March 2016.

ATC participates in the **winter operation** cell contributes to the drafting of respective procedures in the frame of the Aerodrome Manual.

Safety KPI (SAF) - ATM ground

The results of all KPI related performance indicators are summarised in Tab. 3.

The safety record in ATC in the Performance Indicator (PI) **PI 4** ´ATM ground contribution to incidents´[13], shows only a small increase of class C and E incidents of one incident each compared to the PI targets defined in the KPI for ATC in 2015. This is still far below the PI targets set as per class of severity (see Tab. 3).

Fig. 6 provides a graphical comparison with 2011 – 2016 figures (year-to-year end).

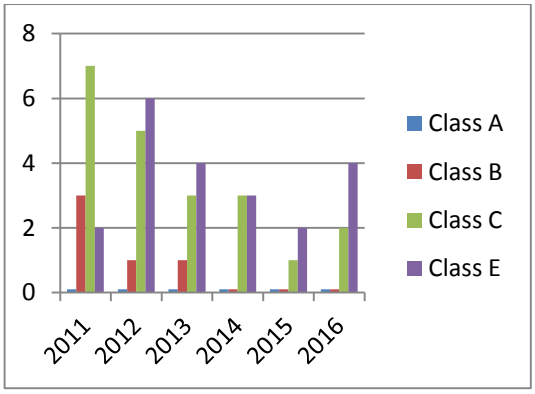

Figure 6 – PI 4 - ATC ground contribution to incidents number in severity classes 2011-2016

[13] This PI sets targets for the maximal tolerable annual number of ATM incidents (where ATC is involved), in five severity classes.

Capacity (CAP)

Luxembourg airport and TMA are not constrained by a significant lack of traffic handling capacity.

There was no significant restriction in capacity, i.e delay due to ATC during the reporting period (see Tab. 3). The CRSTMP[14] delay in 2016 was 0 min/flight; the delay including weather and industrial actions was 0.11 min/flight - a very good achievement again in 2016.

En Route: SES performance indicator and targets for ER flight efficiency (delays) are not applicable to ANA; ER service is provided by Belgocontrol and MUAC.

Terminal (arrival ATFM) delay (PI 5): ANA had an average delay of 0,09 min/flight[15] in 2016; the national target for this PI has still to be agreed with ATC for the coming years.

Airport slot adherence (PI 6): As regards to airport induced delays (ATC departure delay and pre-departure delay) ANA currently monitors the slot adherence (ATOT = - 5 min / + 10 min CTOT) in accordance with EU Regulation 255/2010.

The 2016 results are in line with the demand in the EC Regulation[16] for a > 80% of slots adhered to; however the local target set of 86% of slots adhered was not met (annual average about 82.6%).

ATFM pre-departure delay – PI 7: This is not measured locally (lack of data) and no target is set therefore. The Network Manager provides annual figures for (calculated) ATFM pre-departure on the PRU dashboard which indicates a very low value in 2016 (0.01 min/flight).

Airport delay (taxi-out-time)

Additional time taxi-out – PI 8: No target has yet been established.

This PI is also subject to the overall airport departure process and timing.

Note: The additional taxi-out time is computed by EUROCONTROL/PRU and can be retrieved on the PRU website[17].

Luxembourg is now included in the airport list and data is reported since January 2017.

Fig. 7 gives the average taxi-out time per month for the period between January and June 2017 in minutes.

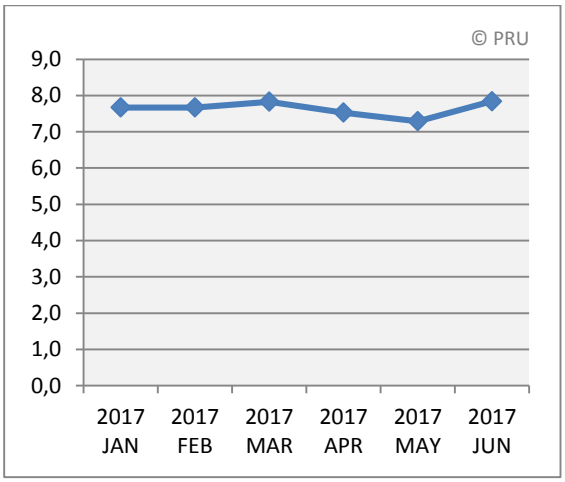

Figure 7 – Unimpeded taxi-out time in min. Jan-Jun 2017, Luxembourg airport (PRU, 2017 data)

CAP & Environment (ENV)

EU - wide performance targets for ENV are of limited relevance for ANA[18] as regards the ´average en-route horizontal flight efficiency´ (KEA).

Of importance is the so-called ´average en-route horizontal flight efficiency´ (HFE) and the related CAP/ ENV **PI 9** (Continuous Descent Operation (CDO).

ANA has now a signed MoU with Belgocontrol as the design authority and provider of en-route ANS in Luxembourg airspace; the agreement now enables to implement the procedures.

In the first quarter of 2017 work already resumed to develop, implement and start trialling of the (in the meantime eight) procedures: four CDOs each for RWY06 and RWY24; the Concept of Operations (for the trial phase) is available. Further CDOs are planned for all inbound directions to ELLX.

The status for 2016 is reported in Tab. 3 (KPI/PI) and Tab. 4 (ESSIP Objectives).

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14 CRSTMP – stands for: Capacity, Routing, Staffing, airspace Management and special events.

15 January – December 2016 average airport ATFM delay as calculated by PRU (see PRU Dashboard: http://www.eurocontrol.int/prudata/dashboard/rp2_2016.html

16 Art. 11 of Regulation (EC) 255/2010 (ATFM IR) states that (1) *´Member States shall ensure that where adherence to ATFM departure slots at an airport of departure is 80 % or less during a year the ATS unit at that airport shall provide relevant information of non-compliance and the actions taken to ensure adherence to ATFM departure slots.´*

17 http://ansperformance.eu/data/set/tx_out/Taxi-Out_Additional_Time.xlsm

18 This is calculated as the difference between actual and optimal flight trajectory for En route outside of a 40 NM circle around the airport.

Table 3 – 2016 ATC KPI achievements & monitoring results

ATC SERVICE - KPIs 4 - 7 - ATFM incidents; ANS delay; CDO - Achievement 2016 (and Q1/2 2017 (only CDO measured)								
KPI 4	**Severity of ATM ground contribution to incidents**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017 Q1-Q2**	**Targets**
PI 4	Severity Class A	0	0	0	0	0	TBD	1
	Severity Class B	1	1	0	0	0	TBD	2
	Severity Class C	5	3	3	1	2	TBD	12
	Severity Class E	6	4	3	2	4	TBD	24
KPI 5	**Arrival ATFM delay attributable to terminal & airport ANS**							
PI 5	Arrival ATFM delay in min	0,13	0,08	0,08	0,11	0,09	TBD	TBD
PI 6	Airport slot adherence (%)	84%	83,14	82,68%	82,6	82,60%	TBD	86%
PI 7	ATFM pre-departure delay in min	0,2	0,33	0,15	0,02	0,01	TBD	TBD
KPI 6	**Additional Taxi Out Time (TOT)**							
PI 8	Additional time in taxi out phase (min/ dep)	1,1	NA	NA	NA	NA	NA	No target set
KPI 7	**Average en-route horizontal flight efficiency**							
PI 9	Develop/implement CDO procedures for APP/DEP ELLX	NA	0	Not achieved	Not achieved	Not achieved	8 CDOs	1
	Common PIs	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**Targets**
PI 1	Maintain / delvelop competence of staff	Achieved	Achieved	Achieved	Achieved	Achieved	TBD	Specific Actions
PI 2	Maintain regular stakeholder consultation intern	Achieved	Achieved	Achieved	Achieved	Achieved	TBD	No target set
PI 3	Maintain regular stakeholder consultation extern	Achieved	Achieved	Achieved	Achieved	Achieved	TBD	No target set

Competence & training – Common PI 1

All required training / refresher training for ATC staff were provided.

ANA has investigated the requirements from the EU Regulation 340/2015[19] and assessed the current training scheme (UTS / UTP) against new or revised requirements in preparation for the audit in 2016. The audit was successfully passed with a certificate in December 2016.

ATC is also developing a ´cross-training´ (dual licence) concept with APP and TWR. Local airlines are informed and will participate in official trials planned for Q4/2017.

ESSIP ATC Objective achievements

Tab. 4 summarizes the results in regard to ESSIP Objectives relevant for ATC.

[19] EU Regulation 340/2015 laying down technical requirements and administrative procedures relating to air traffic controllers' licences and certificates (…).

Table 4 - ESSIP ATC Objectives – Results / Status 2016

ESSIP OBJ	2016 Results	Performance Gap
Airspace Management OBJ		No gap in performance
AOM13.1 - Harmonise OAT and GAT handling	OAT is negligible in LU airspace. Objective is not applicable.	
AOM19.1 - AOM19.3 - ASM support to FUA; real-time airspace data	ASM / ATFCM is handled at FIR Brussels level by EBBR via NM. The Objective is not applicable.	
AOM21.1 - Implementation of Direct Routing	Concerns FABEC ACCs. Not applicable for ANA.	
AOM21.2 - Implementation of Free Route Airspace (FRA)	Concerns FABEC ACCs. Not applicable for ANA.	
ATC & Data Processing OBJ		No gap in performance
ATC02.2 - STCA Level 2	Implemented	
ATC02.8 - Ground based safety nets	Partially implemented (APM still to be implmented)	
ATC07.1 - Implement Arrival Manager (AMAN)	ELLX is not a high density TMA. Not applicable.	
ATC12.1 - Implement automated support for conflict detection, resolution support information and conformance monitoring	Not applicable - no need.	
ATC15.1 - Implement in ER operations , information exchange mechanisms, tools & procedures in support of AMAN operations	Not applicable - no need.	
ATC15.2 - Arrival Manager extended to en-route	Not applicable.	
ATC16 - Implement ACAS II compliant with TCAS II change 7.1	Is implemented since 2012.	
ATC17 - Electronic dialogue as automated assistance to controller during coordination and transfer	OLDI functions supporting automatic assistance during coordination and transfer are implemented but not enabled. - To be done if required by neighbouring centers.	
ATFM		No gap in performance
FCM01 - Implement tactical Flow Management Service	Is implemented since 2007.	
FCM03 - Implement collaborative flight planning	Is implemented since 2007.	
FCM04.1 - Implement short term ATFCM (STAM Ph. 1)	Not applicable to LU.	
FCM04.2 - Implement STAM Phase 2	Not applicable to LU.	
FCM05 - Implementation of interactive rolling NOP	ANA does not operate an ASM system and ELLX is not coordinated slot airport. Not applicable.	
FCM06 - Traffic complexity assessment	Not justified / required in LU airspace.	
Airport ATS		No gap in performance
AOP04.1 / 04.2 - Implement ASMGCS Level 1 / Level 2	A-SMGCS level 1 continued implementation; level 1 is finalised as planned - in operation.	
AOP05 - Implement Airport CDM	Not applicable.	
AOP10 - AOP13 - Time based separation; Initial AOP; ATC clearance monitoring; Automated assistance to ATCOs for surface movement planning & routing	Not applicable.	
Environment		Implementation of eight CDOs (after 2016 ESSIP cycle) in 2017; trials planned; Performance gap closed
ENV01 - Implement Continuous Decent Operation (CDO)	Target to implement CDO was not achieved by end 2016	

CNS PERFORMANCE

CNS is responsible for technical maintenance of COM, NAV, SUR equipment and supports the technical realisation in projects listed in the Tab 5 below (see also Table 17 for the list of all projects).

Table 5 – Active CNS projects 2016 – 17

Project	Delivery date	Comment
ResQ System (157)	End 2017	ATC emergency radio
Surveillance Chain Upgrade (121)	June 2018	
New CNS Network Infrastructure (129)	End February 2018	The migration of the current system to the new network is plan until end 2018
Radio RX/TX	End February 2018	8,33 KHz capabilities
Direction Finder (065)	End February 2018	8,33 KHz capabilities
Centralized RADNET	End 2018	Centralised Surveillance Data Distribution System
TACS	End 2021	Time and Clock system
ATS FDPS / SDPS / ADKON	End 2020	New ATC system : Flight Data Processing System / Surveillance Data Processing System / FDPS Fallback Strip Printer
AMHS	End 2020	centralised ATS Message Handling Service
VCS & VRS	End 2021	communication system & voice recording system
L-ANBLF	End 2021	All Weather Flight System
ILS	End 2022	Landing systems
Radar system[20]	End 2024	airport surveillance radar system

The main achievements in 2016-17, compared to the list of items on the strategic initiatives in the AP 2016-17, are:

- The A-SMGCS project, phase I is in operation since July 31st 2017 and supports ANA ATC Tower Controllers in their task to provide a safe and efficient ground control by increasing the situational awareness in all meteorological conditions. The phase II (Safety Net) is planned for end 2018 begin 2019.
- **MET**: Support to implementation of the AWOS / ATIS (Automatic Weather Observation System / Automatic Terminal Information Service).
- **SUR**: The preparation for the upgrade of the existing SUR system was resumed after ministerial decision (on the SYNergie project).

  CNS supported DFS in an assessment of the current status of the SUR chain.

  CNS created a final technical requirement list for the current SUR system for direct tender with the supplier requesting a new offer. ANA has sufficient assurance for a stable system operation until end 2017 of the current SUR system.
- **Radar data network**: The replacement of the SuRveillance Message Conversion and Distribution Equipment (RMCDE) system by a new SUR Data Distribution System (SDDS) was further delayed (network problems at the wider network level). (This is subject to CNG – Network Group strategy discussions with other related network infrastructure items[21].)
- **WAN / LAN Network**: The implementation of a new local network is now an item on the list of DFS projects and will start in 2017.
- **IT / Server Infrastructure**: The installation of a new server infrastructure based on a virtual server solution is now available and will be used for the Surveillance Chain Upgrade project and for the new Centralised Surveillance Data Distribution System project (New RADNET).

SUR Interoperability (IOP)

The **performance** requirements in EU Regulation 1207/2011 are achieved; the missing part of the IOP Regulation (safety assessment of the current SUR system) was done and accepted by DAC. The system is not fully IOP compliant (lack of performance data / data quality). Through the upgrade of the SUR chain this issue will be resolved.

[20] This project has yet no project number and is not part of the list from the Table 17 in PMO chapter.

[21] An alternative to SDDS (SDDS-NG) is now on the list of installations to be delivered by DFS in 2017; see list of projects.

In the meantime a cost-efficient, safe and stable solution shall be placed at ANA's disposal by the supplier.

CNS safety critical equipment

ATM technical effects (ATM SE): The following two PIs apply under CNS KPI # 8:_

- **PI 10**: ´Availability of safety critical equipment` in three classes (99,90; 99,95; 99,99%).
- **PI 11**: ´Maximal tolerable ATM-SE incidents´ in five classes (AA, A, B, C, E).

Table 6 gives a comparison of the 2015 (entire year) results with 2012 - 2016 in the three categories of equipment availability and the five performance indicators of the CNS KPI.

Fig. 8 gives the trends on Form C – occurrences for the last 3 years in the incidents that occurred.

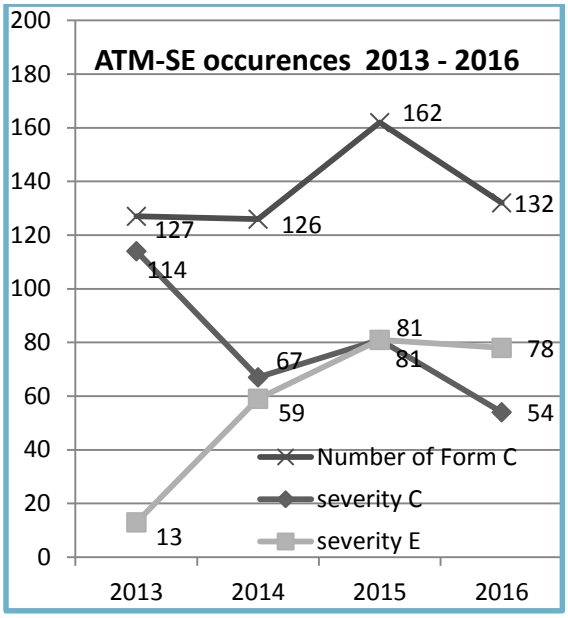

Figure 8 – ATM-SE occurrences 2013 – 2016

Table 6 – CNS KPI / PI Performance 2015 and comparison with 2012- 14 achievements

CNS SERVICE - KPI # 8 - Conformity / reliability of Safety Critical Equipment - Achievement 2016							
KPI #8	**Conformity/reliability of safety critical CNS services**	**2012**	**2013**	**2014**	**2015**	**2016**	**Targets**
PI 10	Availability of safety critical equipment (min 99,90%)	25/31	25/31	29/31	28/30	29/29	30/30
	Availability of safety critical equipment (min 99,95%)	12/13	9/13	13/14	13/14	12/14	14/14
	Availability of safety critical equipment (min 99,99%)	04/04	04/04	03/04	04/04	03/04	04/04
PI 11	Maximal tolerable ATM SE incidents (AA)	0	0	0	0	0	0
	Maximal tolerable ATM SE incidents (A)	0	0	0	0	0	0
	Maximal tolerable ATM SE incidents (B)	0	0	0	0	0	2
	Maximal tolerable ATM SE incidents (C)	84	100	70	67	52	45
	Maximal tolerable ATM SE incidents (E)	24	23	37	64	79	20
PI 12	Average of service response time (standby)	hrs	not monitored	0h 46 min	0 h 30 min	1 h 32 min	< 2h
	Number of service response time > 2hrs (standby)	n	0	1	1	2	0
	Average of service response time (Office Hours)	hrs	not monitored	0h 14 min	0 h 3 min	0 h 1 min	< 2h
	Number of service response time > 2hrs (Office Hours)	n	0	3	2	1	0
PI 13	Equipment calibration > 2 wks after due date	0	0	0	0	1	max. 2 weeks after due date
	Common PIs	**2012**	**2013**	**2014**	**2015**	**2016**	**Targets**
PI 1	Maintain / develop competence of staff (OJT)	not monitored	not monitored	2/2	10 done in Q1, awaiting new comp. scheme	Done	Internal OJT training > 80%
PI 2	Maintain / develop competence of staff (external training)	not monitored	not monitored	39/56	Done	Done	External ATSEP training > 80%
PI 3	Maintain regular stakeholder consultation intern/extern	not monitored	2	2	Stakeh. meetings & SLAs done	Done	> 6 consultation meetgs / annum

Availability: Tab. 5 gives the overall achievement as per category of availability (**PI 10**) against targets. It is to be read in the following way (example first line): From the 29 different systems in this category of equipment that should be available 99,90 % of the time, all 29 where available 99,90% of the time (or more); no system was available less than expected.

All in all the targets have nearly been met with some exemptions; a closer look at the equipment list failed more often than expected points to the DME24[22] with 7 class C occurrences. On the other hand, a number of installations, for example AWOS / ATIS or RVR[23] that were especially prone to failure in 2015 were not particularly noticeable.

Severity: The results in **PI 11** show that

- **no category AA, A or B** (´partially affected ATM service´) incidents occurred;
- **category C** (´degraded ATM service while still able to function fully´) with > 20% less than in 2015 but still more than targeted;
- **category E** (´no impact´) about 20% more happened than in 2015 and nearly 4 times the target figure.

[22] Distance Measuring Equipment

[23] Runway Visual Range

Note: Although the category C and E incidents do not directly affect the provision of ATM services, they require attention and consume resources, time and efforts. It is therefore important to take action to reduce them for cost-efficiency, (manpower) capacity and service quality reasons.

CNS intervention time (PI12): The protection of the ATM system from effects or failures of the technical systems is at the focus of regular and preventive maintenance. If a safety critical system fails, it is important to intervene as soon as is possible. The 24hr / 7 days intervention service aims to ensure ATM service continuity. The service is available at ANA either on site (during regular office hours) or via organised standby duties (during weekends, public holidays and outside office hours / during nights).

This service is a main task of CNS. The results of 2016 show that the target time was nearly always met.

Calibration (PI 13): Regular calibration of equipment and required adjustment of the various sensors to maintain their reliability and validity was done within the timeframe of 2 weeks, i.e. as targeted with one exception.

Training & stakeholder management

Training (Common PI 1 & 2): The foreseen OJT[24] and external training targets for Air Traffic Safety Electronics Personnel (ATSEPs) in line with competence requirements were met (>80%).

Stakeholder management (PI 3): the target of holding more than 6 stakeholder consultations was met in 2016.

ESSIP 2015 – CNS Objectives

Tab. 7 gives the status in the CNS related ESSIP Objectives in 2016 LSSIP report.

The table shows that ANA CNS has one gap in performance in the current ESSIP (IOP). Most Objectives are not applicable or relevant to ANA / to Luxembourg.

It is planned to upgrade the current SUR system and maintain it in stable condition until then (ongoing).

The full replacement of the current monolithic system is however required. A replacement project is planned in the package of the DFS – ANA cooperation agreement (end 2020).

[24] On the Job Training

Table 7 – Status of ESSIP Objectives for CNS – 2016 status[25]

ESSIP OBJ	2016 Results	Performance Gap
CNS - Communication		
COM10 - Migrate AFTN to AMHS	AMHS implemented nand full migration is achieved in June 2014 (all functionalities)	No gap in performance
COM11 - Voice over Internet (VoIP)	Planned - will be implemented	No gap in performance
ITY-AGDL - ATC - air-ground datalink services above FL285	Not applicable to ANA	No gap in performance
ITY-FMTP - Apply common Flight Message Transfer Protocol (FMTP)	System is installed since 2012 and is fully compliant; the safety case was finalised end 2014	No gap in performance
ITY-AGDL - Initial Air-Ground datalink services	Not applicable to ANA	No gap in performance
ITY-AGVCS2 - Air/ground voice channel spacing (8.33kHz) in airspace FL <195	Planned to be achived by 2018 in ANA for ANA frequencies	No gap in performance - ongoing
CNS - Navigation		No gap in performance
NAV03 - Implement P-RNAV	ANA does not plan to implement P-RNAV as there is no justification / business case for it. NOT APPLICABLE.	
NAV10 - Implement APV (Approach Procedure with Vertical Guidance)	ANA has no plan to implement this and has no established need for it. NOT APPLICABLE.	
CNS - Surveillance		
ITY-ACID - Aircraft identification	Planned to be implemented in the wake of the SUR chain upgrade	No gap in performance - ongoing
ITY-SPI - Surveillance performance and Interoperability	Safety assessment done; lack of performance data quality requirements; will be done with upgrade of SUR chain	LATE - planned to be available in 2018

[25] EUROCONTROL (2016), Local Single Sky ImPlementation (LSSIP) – LUXEMBOURG. Year 2016 – Level 1 & 2. Brussels: Eurocontrol.

CNS Strategic initiatives

The situation concerning the Strategic Initiatives and actions planned for CNS (see Annual Plan 2016-17, Tab. 2) are summarised below in Tab. 8:

Table 8 – Status of CNS strategic initiative actions planned for 2016-17

Strategic Items Annual Plan 2016-2017 CNS	Status June 2017
Support actions in the frame of the DFS cooperation agreement	Done - support provided for SUR chain assessment; other CNS infrastructure checks etc.
Continue and finalise the reorganisation of CNS service (MET, COM, SUR)	Done - new organisation in place (see also Annual Plan 2017 - 2018 organigram
Finish SDDS and other network projects in cooperation with FABEC / MUAC partners	Delayed - alternative plan / project developed in the frame of the ANA-DFS agreement
Support the integration of A-SMGCS & TAR2	Support provided; A-SMGCS Phase 1 implemented / integrated
Support to SUR upgrade and implementation of solutions	Done - final upgrade plan agreed with supplier and launched
Finalise installation of new network, virtual server environment	New project in frame of ANA - DFS collaboration for WAN/LAN network
Investigate synergies and common purchase with FABEC partners.	Achieved; see list of DFS projects and equipment installation

The investigation with partners on possible common purchase / common implementation projects as regards CNS infrastructure has now found a comprehensive solution: the ANA – DFS collaboration and installation / service provision package for the (initial) period 2017 - 2027.

The agreement has now been signed and work has started in 2017.

MET PERFORMANCE

MeteoLux, the certified MET provider in Luxembourg provides two distinct services:

- **Aeronautical MET** service (weather forecast, warning, observation and climatology service, weather reports etc.) for ATC, commercial and general aviation, SAR and the airport and aerodrome stakeholders;
- **General MET** service (weather forecast bulletins, alert service, climatological bulletins and customised weather reports) for general public, private and national institutions and other ministries.

MET aims for synergies between both activity areas when planning projects and ensuring project sponsoring. Full cost-transparency of projects for the two areas is enabled.

Aeronautical MET

MeteoLux is compliant with the relevant ICAO standards applicable to aeronautical MET services at a high / very high level of service quality and integrity (see KPI results in Tab. 10).

The results for most indicators are fully in line with the targets with one exemption.

- **PI 14** - ´Timely provision of METAR; no performance data could be established due to a technical problem.

In 2016-17 ANA improved its aeronautical service provision and service quality in line with customer demand:

- Awareness campaign in MET and adaptation of operations to ICAO ANNEX 3 AMD 77A applicable as of November 2016 successfully conducted; MET is now compliant with this ICAO requirement;
- Development and release of guideline for TAF messages (for summer period) to improve accuracy of visibility forecasts in comparison with observed visibilities;
- Remote observation (camera) project finalised (with some delay) to improve the monitoring of weather conditions and the assessment of performance of the MET installations along the RWY via a camera system;
- Replacement of wind sensors (SAT done in October 2016) by new duplicated sensors improving backup possibilities in case of sensor failure;
- Implementation of the ´aerodrome warning´ service to alert aerodrome operators and users about adverse weather (ICAO compliant);
- MET participated in the airport Winter Operations Cell.

The following two projects are still ongoing and will be finalised latest by autumn 2017:

- installation of the AWOS/ATIS test-bed for the test of SW before installation into the operational system;
- installation of the lightning detector in Luxembourg and integration with Belgium lightning networks (for the alert system).

Aeronautical MET cooperation

Of high importance is the partnership and working relations with the Belgian MET provider Belgocontrol as well as the partnership arrangements with other aeronautical MET providers in Europe (MET Alliance; Eumetnet[26]) and research institutes (i.e. RMI[27]).

Several common projects, mutual support, and professional exchange are important to maintain a high level of competence, performance and benchmarking.

General MET services

The cooperation between MeteoLux, institutes and universities in Luxembourg and other public MET services continues. This offers further opportunities for synergies, improved service quality and cost-efficiency.

This part of the MET services is related to outside aeronautical MET areas in cooperation with the following administrations, institutions, and services.

Common PI 3.1: Existing Service Level Agreements (SLAs) are maintained (last SLA updates done in 2016/2017):

- MET service support to Luxembourgish administrations (e.g. agriculture, police, fire brigades and rescue services), universities and international meteorological services continue:

[26] EUMETNET is a network of 31 European National Meteorological Services based in Brussels, Belgium. It exists to provide a framework to organise co-operative programmes between the members in fields of meteorology, data processing and forecasting products (Source: Wikipedia).

[27] RMI = Royal Meteorological Institute of Belgium

- Luxair services – (lightning warning), (local agreement in place and maintained since autumn 2013)[28];
- AGE – *Administration de la Gestion de l´Eau* (SLA in place / maintained since end 2014);
- SNF – *Service de la Navigation Fluviale* (SLA in place / maintained since autumn 2014);
- Creos – energy supplier in Luxembourg (SLA in place / maintained since 2014);
- ASS – *Administration des Services de Secours* (SLA signed end 2015) ;
- Hörgeschädigten Beratung SmH – delivery of severe weather warnings for aurally handicapped people (SLA in place and maintained since 2015);
- The ´extreme weather alert service´ *Plan d'Intervention d'Urgence* (PIU) approved in 05/2015) with services for alert (red / orange) regarding wind (gusts), snow & ice, thunderstorm, extreme heat, extreme cold, heavy rain.

PI 18 is a new performance indicator to monitor and report weather warnings / alerts since 2016.

The communication of severe weather warnings for public distribution (press, radio) was further elaborated and improved, the warning documents simplified to reduce workload during adverse weather conditions.

The *MeteoLux website* and the meteorological bulletin are of public interest and are in frequent use. Visitors of the website receive up-to-date weather information, warnings and forecasts.

Common PI 1.1 & 1.2 – Staff competence

MET staff keeps its competence up-to-date in all relevant working methods and procedures in line with applicable ICAO standards.

The training and competence targets set for the 2016 were achieved.

In Q2/2016 a further customer survey was launched and results were analysed for improvement measures.

In late 2016 MeteoLux together with MET schools / training providers successfully implemented procedures to ensure and prove that initial training of MET forecasters is compliant with WMO technical regulations nr. 49.

[28] This service is based on a local agreement and also provided to ATC and ELE

MET Strategic initiatives

The results regarding the Strategic Initiative (see: Annual Plan 2016-17, Tab. 2) are summarised in the Tab. 9 below.

Table 9 – Status of MET strategic actions for 2016 – 2017

Strategic Items from Annual Plan 2016-2017 - MET	Status June 2017
Finalise re-organisation of CNS premises for MET technical team	Done - new organisation in place (see also Annual Plan 2017 - 2018 organigram) and MET technical team (METTECH) integrated
Implement audit findings on AWOS	DAC Audit was conducted in October 2016; audit findings are planned to be implemented in AWOS by mid 2018
MET services financing to be decided by State authorities	Project on establishment of costs / cost allocation for en-route, terminal, and airport aeronautical MET services was performed together with FIN department in 2016 - 2017
Compile study report (on financing of MET) present results to State authorities for decision making	Still to be done

The next step for State budget provision for non-aeronautical services still needs to be decided. The re-organisation of aerodrome and responsibilities has not yet been finalised and is an important input to this decision.

Table 10 – Performance results against targets in PI´s for ANA aeronautical MET in 2012-2016

MET SERVICE - KPI 9 - Results 2012-2016 against set PI targets							
KPI # 9	**Conformity/reliability of safety critical aeronautical MET service services**	**2012**	**2013**	**2014**	**2015**	**2016**	**2016-17 Targets**
PI # 14	Timely provision of METAR	97,80%	98,50%	98,5/98,0%	98,7/97%	no data	≥ 96,5%
PI # 15	Timely provision of MET bulletins	96,60%	99,50%	98,6/98,1%	98,9/98,1%	97,00%	≥ 97%
PI # 16	Timely provision of TAF	98,80%	97,30%	99,7/99,8%	100%/NA	100%/100%	≥ 97%
PI # 17 TAF verification accuracy (Data after / are for the period Oct 2015 - Mar 2016)	Wind direction	No data	0,99	1,00	1,0/1,0	1,0/1,0	≥ 0,90
	Wind speed	No data	0,99	0,99	0,99/0,99	0,99/0,99	≥ 0,90
	Wind gusts (in stable conditions)	No data	0,90	0,01	0,91/0,94	0,94/0,92	≥ 0,90
	Visibility	No data	0,41	0,44	0,15/0,43	0,43/0,30	≥ 0,30
	Present weather	No data	0,36	0,50	0,44/0,39	0,39/0,46	≥ 0,30
	Ceiling	No data	0,44	0,43	0,42/0,45	0,45/0,35	≥ 0,30
PI # 18	MET wanings issued	NA	NA	NA	Total:	149	No target
PI # 19	Increase visits Meteolux website	No data	No data	5,60%	17,90%	minus 10,6%	> 0
PI # 20	Increase subscribtions to MET Bulletin	No data	No data	2,30%	14,10%	6,00%	> 0
Common PI´s		**2012**	**2013**	**2014**	**2015**	**2016**	**2016-2017**
PI # 1.1	Application of WMO competence assessment	not monitored	Yes	Yes	Yes	Yes	Applied
PI # 1.2	Specific Meteolux related training	Yes	Yes	Yes	Yes	Yes	Provided
PI # 2	Update cycle of SLAs respected (internal stakeholders)	No	Yes	Yes	Yes	Yes	100%
PI # 3.1	Update cycle of SLAs respected (external stakeholders)	Yes	Yes	Yes	Yes	Yes	100%
PI # 3.2	Customer polling	No	No	Yes	Yes	Yes	once/year

Notes: The TAF verification (PI 17) measures the (mean) correctness of prediction (correct hits / false alarm and correct against random prediction) and is a measure of accuracy.

The data for TAF in 2016 on left of the separator is for the period October 2015 to March 2016; the data to the right of the separator is for the period April to September 2016.

PI 18 (number of MET warning issued) is monitored for seven warning issues: Wind, rain, snow, extreme cold, freezing rain, extreme heat and thunderstorms; here only the overall figure is given.

AIS - AERONAUTICAL INFORMATION SERVICE

AIS performs three main functions: ARO, AIS and TAX.

- The **ARO** (ATS Reporting Office) is responsible for the reception, verification, change and distribution of flight plans and associated messages. Other responsibilities are to alert the appropriate organisations regarding aircraft in need of search and rescue services and to assist them as required (Alerting Service). In addition Pre-Flight Information Bulletins (PIB) and SNOWTAM are issued as well as information about Air Traffic Flow Management (ATFM).
- The **AIS** function in ANA ensures the flow of information necessary for the safety, regularity and efficiency of international air navigation through publication of the Aeronautical Information Publication (AIP) for static (permanent) information and the distribution of Notice(s) to Airmen (NOTAM) for dynamic (temporary) information.
- The **TAX** sub-unit performs the computation of the Terminal Navigation Charges (TNC) in accordance with the EU charging regulation and local modulation scheme. This task consists in the monthly calculation and invoicing of terminal charges. Further details on this service are given in the Finance Chapter.

2016 – 2017 activities & projects

AIS main activities and projects in 2016-17 were:

- Update of published AIP data - **IAIP** (Integrated Aeronautical Information Publication; ICAO Annex 15[29]).
- Complete new layout for entire AIP checked and validated - feedback to Belgocontrol provided.
- Contribution to and support of aerodrome certification activities.
- Installation of Level 5 integrated briefing (in 2017).

IAIP development: This work started in 2015/16 and aimed to develop a procedure and processes to

- determine and formalise AIS workflows;
- improve the cooperation between AIS and Belgocontrol AIM;
- demonstrate and describe the roles and responsibilities of ANA AIS as an AIS provider;
- address the EASA UNCs in regard to the requirements for conformance with the applicable standards:
  - ICAO Annex 15 and ICAO doc 8126;
  - Eurocontrol AIS data process and
  - identify and address the applicable requirements of EU 73/2010 (ADQ).

These actions were finalised and released in 2016 as the new AIS data provision and AIP procedures.

In a second step external promotion of the procedures was done with data providers in preparation of the service level agreements (SLAs) to be set up with these parties.

AER / aerodrome certification support: AIS was actively involved in AER certification activities in 2016-17 in the domain of aeronautical information; these activities will continue until the certification process is finished.

Details of activities in which AIS is involved are provided in the AER (Aerodrome) Chapter.

Aeronautical data provision / TOD (Terrain & Obstacle Data): The availability of 3-dimensional aeronautical terrain and obstacle data is a prerequisite for a number of implementation projects and ATC procedures (e.g. CDO), aerodrome infrastructure projects (e.g. buildings, masts, navigation aids) or its vicinity (e.g. power lines, high buildings) and or in the country (e.g. windmills).

The data must be handled according to the requirements of the Aeronautical Data Quality (ADQ) regulation EC 73/2011 and ICAO Annex 15.

Regulatory framework: The ministerial order issued in November 2015 by MDDI[30] allocated the responsibilities to AIS and DAC in respect to the management and oversight of TOD. The department responsible for territorial planning in Luxembourg was asked to enable AIS to receive obstacle data from obstacle owners.

KPI Performance

Tab. 11 (next page) gives the results on the AIS / ARO KPI and PIs and the status of achievement in 2016 (Q1 – Q4).

[29] See: Roadmap for the Transition from AIS to AIM, ICAO, first edition – 2009.
Substantial amendment of ICAO Annex 15 is ongoing with a new PANS AIM.

[30] *Arret Ministériel* dated 25 November 2015 (signed).

Table 11 – AIS performance results 2016 (year to year-end)

AIS SERVICE - KPI 10 - Integrity / quality of aeronautical information - Achievement 2016					
KPI 10	**Integrity / quality of aeronautical information**	**2014 (Q1-Q4)**	**2015 (Q1-Q4)**	**2016 (Q1-Q4)**	**2015 Targets**
PI 21	SLA completed with external data providers	0	0	0	No target set
PI 22	Data quality of Luxembourg aeronautical data published by Belgocontrol	1,77%	3,05%	0%	0%
PI 23	Data quality of raw data received and transmitted by AIS	6,24%	0%	0,91%	0%
Common PIs		**2014**	**2015**	**2016**	
PI 1	Maintain / develop competence of AIS staff	Done	Done	Done	100%
PI 2	Maintain regular consultation and exchange with ANA internal stakeholders	Done	Done	Done	No target set
PI 3	Maintain regular consultation and exchange with ANA external stakeholders	Done	Done	Done	No target set

Notes: As regards **PI 21** no SLA with external data providers was concluded in 2016 - 2017. AIS still has no clear mandate for this task; external data providers (i.e. wind parks, building authorities…) have not been obliged officially to provide the data. However, AIS has established contacts with wind park operators and received about 70 navigation obstacle datasets in late 2016.

Luxembourg airlines, private airports / heliports etc. were also contacted and it was agreed to establish SLAs in the remainder of 2017.

The measurement of **PI 22** is the number of detected differences between the data issued by AIS and the data actually published by Belgocontrol in % of all published data.

Similarly, **PI 23** measures the number of detected differences between data received from an external data provider and the data that is transmitted by AIS to Belgocontrol following AIS internal consistency etc. checks in % of all data received from a data provider.

The institutional and organisational arrangements for AIS and the regulatory framework and obligations under which AIS is supposed to operate is currently under development.

Regarding the **Common PI 1 i**t is to be noted that two additional operational staff have been trained internally. A competence scheme is under development.

Common PI 2: AIS is involved and participates in all relevant meetings / consults with internal parties: ATC (on flight issues; alerts etc.), CNS (AIS equipment) and SIS (winter ops procedures and coordination with MET, ATC, and AER). Meetings were also held with the finance department on TNC for the 2015 and 2016 outturn calculations, with the IT function in ADM, with the quality function, and the safety unit (SMU).

Common PI 3: AIS conducted workshops with Belgocontrol AIM to assure conformity and improve reliability of service. Further meetings were held with airlines, DAC, Luxembourg Army and several obstacle owners (e.g. wind park operators).

AIS participated in the FABEC SC ENV and AIM SG, Eurocontrol AI-OPS, in the SWIM teams, and in several audits throughout the year.

In addition to this, AIS participated / conducted a total of 25 external meetings.

AIS ESSIP achievements 2016

Tab. 12 gives the status of AIS-related ESSIP Objectives as reported in the Luxembourg 2016 LSSIP report.

Table 12 - ESSIP Objective AIS – Results in the 2016 reporting cycle

ESSIP OBJ	2016 Results	Performance Gap
AIS/MET Briefing **INF04 - Implement integrated briefing**	This objective applies to AIS and MET By end 2016 integrated briefing facilities were not ready (LATE). Full Level 5 briefing facilities are available since March 2017. Video briefing facilities for VFR pilots are installed.	Video briefing facility are installed (waiting for endorsement). Full Level 5 briefing facilities installed in March 2017. Performance gap closed
Aeronautical Data **ITY-ADQ - Ensure quality of aeronautical data and areonautical information**	This objective applies to AIS and AER ANA AIS issues data to Belgocontrol as the next intended user and publisher of information. Formal arrangements are in place and documented in IMS. ANA AIS lacks inputs and instructions from a competent authority on aeronautical data handling, management and maintenance in line with EC 73/2010 requirements, in particular eTOD.	State and DAC regulatory actions as regards AIS role and the applicability of the ADQ requirements are **LATE.** ANA / AIS has not been appointed as aeronautical data provider for Luxembourg.
Aeronautical Data **INF07 - Electronic Terrain and Obstacle Data**	This objective applies to the ANSP and to APO (Aerodrome) The ministerial order was published in Nov 2015. Institutional and organisational framework is under development. The TOD tender was let.	State and DAC framework arrangements and regulatory actions are **LATE.** TOD data is expected to be gathered in the remainder of the year 2017

Tab. 12 indicates that ANA has an immediate gap in the achievement of the current ESSIP Objectives relevant for AIS in regard to two Objectives:

- **Integrated briefing level 5**: Full level 5 briefing was implemented in March 2017.
- **Video briefing**: The video based briefing facilities planned by AIS and MET are installed. The facilities are located in the VFR environment.
- **ADQ implementation (EC 73/2010)**: ADQ compliance issues will be solved with the upcoming certification of ANA AIS as an AISP according to the common requirements.
- **TOD**: The acquisition of terrain and obstacle data (photogrammetry) of the entire territory of Luxembourg and its TMA is ongoing.

  It is foreseen that AIS will be the service to handle and maintain the data on obstacles and terrain. The process to set up the framework has started but no final decision has yet been taken.

AIS - strategic initiatives

As indicated before the process and proposal established and sent to MDDI for a national policy / regulatory framework for aeronautical data and information handling in line with ADQ Rule is still ongoing.

The eTOD tender has been published and assigned and the acquisition of electronic obstacle data for the airport, the whole territory of the GD of Luxembourg and the parts of the Luxembourg TMA located over foreign soil should be starting in 2017. The data is required to implement pending PANS-OPS, obstacle related aerodrome certification issues and further CDO operation procedures in Luxembourg airspace.

The need to acquire and maintain an electronic database of TOD for the aerodrome areas and the entire Luxembourg terrain and obstacles on an ongoing basis and in line with the ICAO Annex 15 requirements still persists.

PART B

ANA AERODROME SERVICES

AER - AERODROME SERVICES

In late 2016 MDDI nominated lux-Airport to take over the role of Aerodrome Operator (AOP) from ANA and to prepare the aerodrome for certification in accordance with (EU) 139/2014.

ANA has since cooperated, and continues to cooperate, with lux-Airport in the transfer of knowledge, skills and work processes where requested.

New framework for ANA - AER

ANA will continue to provide ANS for the Airport and surrounding airspace and to provide the Rescue and Fire Fighting Service (RFFS) required for certification of the aerodrome (and by national legislation).

ANA will also continue to perform certain functions related to aerodrome operations, for a temporary period, until lux-Airport has sufficient resources and competences to perform these functions.

AER will be involved in the transfer of knowledge and skills where applicable and will undertake those functions which have not yet been transferred to lux-Airport.

On completion of these activities it is anticipated that the AER service will cease and personnel deployed elsewhere in ANA.

This report concentrates on the remaining activities and projects related to the services provided by AER, and the achievements in the major KPIs and PIs. Clearly, the role and activities of the AER service will change over the period addressed by this report and consequently not all items will necessarily be completed by ANA; it is for this reason that KPIs and PIs for this reporting period and for the coming period may not accurately reflect true performance.

The reports of the electro-technical department (ELE) and of the Rescue and Fire fighting Service (SIS) are provided in separate chapters.

Overview of AER work packages

The work that AER and related service partners are currently performing on a day-to-day basis to maintain aerodrome operations are the following:

- Supervising and coordinating works required for the **maintenance of the manoeuvring area** in coordination with the main contractor PCH.
- Performing **safety activities** related to operational management of the manoeuvring area in compliance with safety requirements and the verification by the CERT department that this is done in accordance with procedures and a sensible output is achieved.
- Providing advice and technical specifications related to **aerodrome works** within its current area of responsibility (e.g. markings and panels on the movement area, RWY/TWY surface friction measurements; assessing and providing technical advice on proposed building works and on obstacles in the vicinity of the airport).
- For the winter 2017 season ANA AER Department will lead the **winter operations** cell, and coordinate and implement snow and ice clearance and treatment actions (including management of de-icing material storage).

  Following the winter 2017 season it is expected that this responsibility will be transferred to lux-Airport.
- Conducting **manoeuvring area inspections** (e.g. checking for Foreign Objects Debris (FOD); serviceability of signs) in coordination with ATC and SIS.
- Together with CERT department, AER is responsible for the monitoring, reporting, and developing actions regarding the risk of **TWY incursions**. This work is closely coordinated with lux-Airport through the Airside Safety Team.
- **Wildlife hazard management services** are part of the AER working arrangements in a similar way as **SIS** and **ELE** and monitor and report in the frame of a common AER KPI (KPI 18; see Tab. 15).

RWY and TWY projects & activities

RWY / TWY maintenance: The prevailing conditions and state of the RWY and also TWYs demands regular monitoring and repair works if found necessary.

During 2016 -17 substantial re-surfacing works were done on the RWY and TWYs. A total of 140 000 m^2 of tarmac was renewed on the manoeuvring area in 2016. 300 ground lights and 10 000 m cable were repaired or replaced.

During the times of re-surfacing work in progress the airport was closed from 00:00 – 06:00hrs but the target was to maintain uninterrupted airport operations at all other times.

This has worked out quite well and only for a short period of around 30 minutes the airport was closed due to urgent repair work during the day (see **PI 48** in Tab. 15).

The SLA agreed on and signed between ANA and PCH covers the planning, organisation and execution of the assigned works and has shown its merits.

It is expected that the management of much of this work will be undertaken by lux-Airport at some point in the future.

RWY / TWY refurbishment: A complete rebuild of the entire RWY (and TWYs) is long overdue.

ANA continues to provide technical and operational advice to lux-Airport and PCH (project managers) regarding this work.

Proper oversight and controls must be in place whilst the work is carried out, some of which is expected to be done during normal operating hours. ANA expects the transfer of responsibility for supervising airside works to have been transferred to lux-Airport before the principal works commence.

RWY surface friction measurement: RWY surface conditions have to be monitored during periods of wintery weather and to identify areas of pavement which may need to be replaced. The friction measurement vehicles used are operated by SIS.

During the winter 2016-17 the equipment has worked well and results were reliable and valid.

Measurements made for monitoring maintenance requirements are completed periodically and the results are provided to lux-Airport to assist planning of maintenance.

Manoeuvring area inspection: The inspection of the RWY/TWY is a shared activity done by AER and SIS.

Proper training of inspectors (see common **PI 1** in Tab. 13) and the maintenance of a regular schedule to perform this duty are key factors for inspection quality.

A training programme for personnel undertaking this task was defined and rolled out as of May 2016.

It is expected that responsibility for inspections will be transferred to lux-Airport at some point in the future and it is anticipated that this training programme will assist in the transfer of knowledge and skills requited to lux-Airport personnel.

Snow removal: This work is performed by PCH on a 24hr operations basis. **PI 49** in Tab. 15 is the average elapsed time between a call for removal and start of removal actions during airport operational hrs.

The results for the winter period 2016 -17 indicates that intervention time was not a problem, also thanks to a mild winter.

AER KPI Performance

The overall results for the AER **KPI 18** and specific PIs are given in Table 13.

The table indicates the responsibilities of the various AER partners:

- SIS – Fire brigade and rescue service (see also Chapter 1.10);
- CERT department (SMU – Safety Management Unit);
- Wildlife management;
- RWY / TWY maintenance & snow removal - Ponts et Chaussée (PCH).

FOD (PI 43): SIS holds a register and all reports of FOD collected during regular RWY inspections or reported / found by other parties.

Objects found are classified and reported to SIS by AER and the wildlife service (in case of wildlife debris).

Bird strike & wildlife (PI 46): ANAs wildlife service is involved in the RWY inspections and classification of wildlife species found and correlates the findings with bird strike reports per 10000 movements.

Table 13 – Results in aerodrome service related PIs – 2016-17[31]

AER SERVICE - KPI 18 - Safety, quality and integrity of aerodrome service Achievements 2013 - 2016						
KPI 18	**Safety, quality and integrity of aerodrome service**	**2013 (Q1-Q4)**	**2014 (Q1-Q4)**	**2015 (Q1-Q4)**	**2016 (Q1-Q4)**	**Targets**
PI 43	Foreign Objects Disposal (FOD) (Unit responsible: SIS)	Birds: 29 Other A.: 4 Metal: 7 Veget.: 3	Birds: 29 Other A.: 4 Metal: 7 Veget.: 3	Birds: 42 Other A: 5 Metal: 5 Vegetation: 3 Other items: 14	Birds: 1 Other Animals: 2 Tools / Metal Pieces: 1 Vegetation: 0 Other items: 3	No target set
PI 44	Fuel spills (keeping records and report) (Unit responsible: SIS)	NA	NA	NA	Done	No target set
PI 45	Aerodrome vehicle RWY / TWY incursions and excursions (Unit responsible: SMU)	ACFT: 3 Cars: 1	ACFT: 2 Cars: 0	ACFT: 2 Cars: 0	ACFT: 6 Cars: 2	0
PI 46	Bird strikes - Wildlife management (nr. of strikes/10k movements) (Unit responsible: Wildlife)	NA	Area 1: 1,39 / 1,95 Area 2: 0	Area 1: 2,19 / 2,73 Area 2: 0	Area 1: 1,36 Area 2: Nil	No target set
PI 47	Obstacle management	non-auth.: 3 author.: 7	non-auth.: 4 author.: 10	non-auth.: 0 author.: 5	non-auth.: 5 author.: 12	non-authorised = 0
PI 48	Delayed RWY opening due to Work In Progress (WIP) (resonsible Unit: AER)	NA	2h 10	4 h 35	0 h 31	No target set
PI 49	Intervention-Call Time for Snow Removal, de-icing / anti-icing (resonsible Unit: AER)	NA	2h 10	4 h 35	0 h 30	No target set
PI 57	Delayed RWY opening due to snow removal (resonsible Unit: AER)	NA	NA	0 h 52	0 hr 00	0 minutes
PI 58	Incident intervention (responsible Unit: SIS)	Fire: 159 Techn.: 86	Fire: 152 Techn.: 95	Fire: 161 Techn.: 110	Total: 281 92 - first aid 47 - fire alarms 67 - fuel/oil spills 28 - danger. goods 27 - aircraft related alerts 20 - other	No target set
	Common PI´s					
PI 1	Maintain/develop competence of staff	Several ACI courses on safety held	ACI - ICAO Annex 14, EASA certification	Competence/Trg. Defined / evaluated Job description done	InspectorTrg held Train-the-trainer trg organised and held Inspector training for SIS will be held in 2017	Target to be defined
PI 2	Maintain regular consultation with internal stakeholders	Achieved	Achieved	Achieved	Achieved	Target to be defined
PI 3	Maintain regular consultation with external stakeholders	Achieved	Achieved	Achieved	Achieved	Target to be defined

[31] PI44 was integrated in KPI18 in 2016 KPI review. For records in past years see SIS chapter. PI 58 provide a more detailed list of type of interventions for 2016 (and following years)

Incursions (PI 45): This PI concerns reported incursions.

It is noted that the number of incursion by aircraft has increased. No clear common factor for this increase can be identified although non-public transport flights were commonly involved.

ANA is currently in discussions with the national safety regulator DAC in order to identify any actions that may be taken to reduce the level of involvement of such flights.

SIS interventions (PI 58): The total number of interventions has not increased substantially.

Since the KPI version 2016 SIS provides a further breakdown of the different types of interventions performed on the aerodrome.

Aerodrome certification work

The Aerodrome Certification Project in line with the EU 139/2014 Regulation[32] is a high priority item for lux-Airport as the newly appointed AOP and accountable manager of the airport, for ANA and all other airport partners.

Full understanding of the applicable regulation and respective EASA Accepted Means of Compliance (AMC) and Guidance Material (GM) is a key part for the success.

The AER team has the authority to give directions in regard to the operational and technical infrastructure management issues. The responsibility for the certification process is in the hands of the accountable manager, lux-Airport.

ANA activities in the Steering Group

The **Certification Steering Group** includes the aerodrome partners which each are responsible for delivering the documented procedures or manuals in their respective capacities as appropriate.

The contributions from the various parties are compiled in the Aerodrome Manual, the principal document for the certification of the aerodrome which includes all (revised and harmonised) procedures / processes and the safety measures and methods.

ANA document contribution: Immediately following nomination of lux-Airport as AOP, ANA transferred existing documentation that had been prepared for aerodrome certification (draft versions of the Aerodrome Manual, Safety Management Manual, Airside Safety Manual and the current version of Airside driving rules and standards).

ANA has since provided or transferred documentation on a wide range of topics such as:

Procedures

- Friction test procedure;
- geographical information system (GIS) procedure;
- isolated aircraft parking position procedure;
- monitoring and inspection Procedure;
- procedure for aircraft with higher coder letter - long wheel base aircraft;
- procedure for maintenance and handling of winter operations vehicles;
- procedure for markings and colours of vehicles;
- procedure for waste removal;
- procedure for works inside ILS protected areas;
- winter operations procedure;
- works safety procedure;
- first proposal for publication issued.

Certification documents

- markings conformity document;
- R.E.S.A conformity document;
- guidance signs conformity document;
- RWY strip conformity document;
- technical and circular roads conformity document;
- Airfield Ground Lighting (AGL) conformity document;
- certification specifications conformity document.

AER staff competence (common PI 1)

Delivery of a training program for Aerodrome inspectors has been completed for all ANA personnel involved in such activities. The training includes classroom sessions (delivered by an external provider), OJTs and practical assessments.

Selected personnel of AER have attended 'train-the-trainer' courses / workshops to enable them to provide internal trainings (classroom and OJT) to newcomers in the inspection work.

[32] EU Regulation 139/2014 laying down requirements and administrative procedures related to aerodromes pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council.

ESSIP performance

AER was still charged in the 2016 cycle with ESSIP objectives (Aerodrome Operator Part, AOP) and responsible for certain stakeholder lines of actions (SLoAs) as listed below (for detailed descriptions see Luxembourg LSSIP (2016).

Responsibility for managing many of these activities will be formally transferred to lux-Airport for the future.

- **AOP03** – Prevention of RWY incursions – (lux-Airport). Luxembourg is late in implementing the ICAO RT phraseology and training for vehicle drivers; this is now a responsibility of the accountable manager lux-Airport.
- **AOP11** – Initial Airport Operations plan. APO has planned to implement the airport part by 2021;
- **ENV01** – Implement CDO techniques for environmental improvements. The AOP (as from 2017 onwards: lux-Airport) is asked to provide monitoring and feedback reports on CDO operations to users.

  ANA developed and implemented (for trials) eight CDO procedures.
- **INF07** – Electronic TOD. For the airport area the AOP normally shall plan and conduct the activities for the implementation of the TOD as required by the national TOD plan. Since it is decided that ANA (AIS) shall implement and maintain the TOD database, this task is assigned to ANA.

  Luxembourg is late in this objective.
- **SAF11** – Prevention of RWY excursions – the AOP is requested to implement all applicable actions from the EAPRE[33]. Some actions are still pending.

Strategic initiatives in AER

ANA AER had four strategic tasks for the 2016-17 reporting period (achievements in brackets):

- to transfer certification competence and responsibility to lux-Airport as the accountable manager and AOP of the aerodrome(ongoing);
- to contribute to the certification related works as AER (ongoing);
- to act in accordance with the operational decisions taken by State stakeholders (done).

[33] European Action Plan for the Prevention of RWY Excursions (EAPPRE), (Eurocontrol).

ELE - ELECTRO – TECHNICAL SERVICE

ELE provides essential services to ANS and AER of ANA and is responsible for a number of safety critical equipment. ELE installs, maintains and improves the electrical infrastructure of the aerodrome:

- **Airfield Ground Lighting** (AGL) system (Runway (RWY), Taxiway (TWY), Approach (APP), stop bars, signs);
- **primary power** supply to the aerodrome infrastructure;
- **secondary power** supply (during outage, failure or in case of contingency) through auxiliary power units or secondary power supply.

ELE also maintains the integrity, validity and reliability of a geographical information system (*Système d´Information Géographique*, SIG) of the aerodrome infrastructure (e.g. maps of electrical and fibre optic cabling and wiring; infrastructure maps; geographical info) and maintains ANA's telephone system).

SIG is an important input source and enabler for planning and installation of nearly all infrastructure projects as, for example the RWY and TWY refurbishment works, the A-SMGCS project, the power supply projects and all construction and building projects.

ELE is supervised in accordance with applicable standards, processes and procedures.

The **ELE operational manual** is regularly updated. The last revision (Version 4.0) was released in July 2017[34].

The main changes concern:

- AGL maintenance plan;
- maintenance practices procedures.

The safety survey conducted in 2016-17 was done together with the AER department. The survey targeted the health and safety related issues in regards to AER and ELE maintenance tasks and equipment[35].

The study revealed:

- Health & Safety (HSE) issues that need to be resolved;
- additional power grid contingency measures required;
- outdated electrical equipment that should be replaced.

The report also describes which changes in the working procedures during re-surfacing works should be made to respect the health and safety requirements and reduce the workload.

The identified issues as regards training (HSE) and equipment are planned to be resolved in late 2017 / beginning 2018.

KPI 11 – availability of safety critical equipment

AGL (PI 24): The efforts in 2015-16 for a better integration of ELE into the AER Department and the development of improved working procedures with PCH during re-surfacing works have had a lasting effect.

Tab. 14 gives the results against the performance indicators.

The figures for 2016 show a high above target availability of lights: about 97% (RWY24) and 88% (RWY06) of the RWY centre lights are above the ICAO standard in light intensity.

Secondary power supply (APP lights) (PI 25): This PI analyses the capability to switch-over from the main to secondary power systems to secondary power with a target of < 1 sec. This is ensured at a level of 100%.

The measurement of the switch-over time is performed once every 5 years.

Secondary power supply - all lighting system (PI 26): Similar to the APP lights above, the measurement of the switch over time are done once every 5 years.

In 2013 ANA planned the implementation of a dual (independent) power supply and infrastructure and started two main projects (see also list of projects in Tab. 17):

- **Main Power Station South**- New power supply station with a second external source for electric power supply and a further Emergency Power Unit (Genset).

The project was finished in May 2017.

Fig. 9 shows the new Station South building.

[34] ANA ELECTROTECHNICAL DEPT. OPERATIONAL MANUAL, Version 4.0.

[35] ELE (2017), Safety Survey: Health and Safety of Maintenance Works in AER and ELE Department. Version 1.0 (March 2017; released).

Figure 9 – New Power Station South (ANA)

– **Cabling Stations South** – this project was also finished in spring 2017.

The new infrastructure offers a reliable, modern, and safe working environment for ELE staff (see Fig. 10, the 3kV distribution board[36]).

The work on the new power stations at Gates 06, 18 and 24 are ongoing and will be finished in 2018.

Planning has started for a new power station North which shall also become operational in 2018.

Figure 10 – 3kV distribution board in the new power station South

Safety - ATM technical effects (ATM SE): The focus of regular and preventive maintenance and the 24hr service intervention set-up is to protect the aerodrome and the ATM system from electro-technical failures of safety critical nature.

PI 27 measures the critical incidents on ATM Services as the *´Maximal tolerable number of ELE direct contribution to severity classes AA – E`*.

The results in 2016 show a very low rate of incidents with no incidents that rendered the system fully or partly to inability to provide ATM services (classes AA – B).

Class C incidents (degraded ATM service while still able to function fully) show the lowest number of incidents since 2013.

Class E effects have no safety nor performance impacts. Fig. 11 depicts the trend graphically.

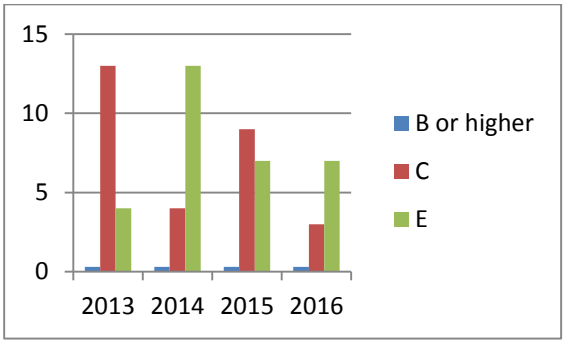

Figure 11 – ATM SE incidents 2013-2016

PI 28 - **service response time:** In 2016 on average 35 minutes pass before interventions start. This is still well below the target time.

A new Technical Intervention List (TIL) tool was developed and programmed by ELE Staff in 2016 which has now been in place since December 2016. The tool allows a better recording and tracking of intervention activities (see Fig. 12).

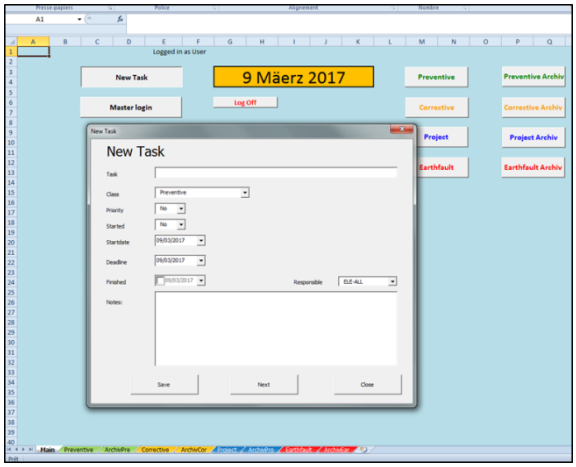

Figure 12 – Technical Intervention Tool (TIL) – entry screen

Common PI 1 – training & competence: The following training and competence upkeep exercises were organised and held with ELE staff:

[36] Station South contains also a new 400V distribution board.

- MT high voltage switch training
- Fall protection training
- Arbeiten unter Spannung (working under tension) (6/2);
- AGLPlus 3 Airfield Ground Lighting Maintenance Management (2/5);
- ALCMS Service Training (7/0,5);
- ALCMS Update and Refresher Training (7/0,5);
- Inspection of movement area (5/1);
- Schaltberechtigung 1 – 36 kV (5/2);
- Safety Assessment / Occurrence Reporting (1/15);
- Intro QMS/SMS/PM (3/0,5);
- ISO 9001/2015 (1/1,5);
- Airport Communication (2/0,5);
- Maintenance of medium tension equipment (1/2);
- Other (Management / leadership etc) (1/2).

Common PI 2 – internal stakeholder management: ELE hold regular meetings with its internal partners and agrees new common actions, revises existing SLAs and contributes to OPS manuals.

Common PI 2 – external stakeholder management: ELE manages a number of support or maintenance contracts with external suppliers or service providers. They are monitored, revised and new contracts are closed as appropriate.

One issue which has been open for some time is the release of the SLA between PCH and ANA.

ELE Strategic initiatives

ELE is already strongly involved in the ongoing aerodrome certification project (see the AER Chapter for more details) and has established good working relations with its partners.

The strategic tasks and projects for the 2016-2017 period (see also project list in Tab. 17, PMO Chapter):

- **Clarification of ELE role** in the frame of the high level stakeholder decision on the transfer of the AOP role from ANA to lux-Airport accountable manager: this task is still ongoing.
- **Frangible masts APP lights**; (one mast pending legal case): This project has been put on hold.
- **Participation of ELE in the RWY refurbishment** planning to be decided: ELE will most probably participate in the work. However, the framework conditions are still to be agreed with lux-Airport.

Table 14 – ELE KPI and PI results 2013-2016

ELE SERVICE - KPI 11 - Availability of Safety Critical Equipment 2016 - 2017						
KPI 11	**Conformity/reliability of safety critical ELE services**	**2013**	**2014**	**2015**	**2016**	**Targets**
PI 24	Availability of safety critical equipment - RWY AGL (Airfield Ground Lighting)	97% TDZ	1. Measure 96% RWY 24 89% RWY 06 2. Measure 80% RWY24 71% RWY06 91% TDZ	94% RWY 24 96% RWY 06 98% TDZ	97% RWY 24 88% RWY 06	Between 75 - 95%
PI 25	Availability of safety critical equipment - secondary power supply	NA	1. Measure 2 sec 2. Measure < 1 sec	To be done all 5 yrs	Procedure in version 4.0 of ELE operational manual	100% < 1 sec
PI 26	Availability of safety critical equipment - all lighting systems	NA	1. Measure 18 sec 2. Measure < 15 sec	To be done all 5 yrs	Procedure in version 4.0 of ELE operational manual	100% < 15 sec
PI 27 Levels	Maximum tolerable ATM SE incidents (AA)	0	0	0	0	0
	Maximal tolerable ATM SE incidents (A)	0	0	0	0	0
	Maximal tolerable ATM SE incidents (B)	0	0	0	0	2
	Maximal tolerable ATM SE incidents (C)	13	4	9	3	10
	Maximal tolerable ATM SE incidents (E)	4	13	7	7	20
PI 28	Average service response time	NA	49 min	34 min	35 min	< 2 hrs
Common PIs		**2013**	**2014**	**2015**	**2016**	**Targets**
PI # 1	Maintain/ develop competence of ELE staff	Only plan established	Needs established; training started	Consense training module in test phase	AuS and MT high voltage switch training in 2016 & in 2017 MT switch training in 2017	Training plan completed 100% for all staff
PI # 2	Stakeholder consultation (internal stakeholders)	NA	MET/ELE SLA	CNS (maintenance proc.) AIS (data provider list)	SLA MeteLux-ELE Closer coordination of ELE with AER	Regular consultation and exchange
PI # 3	Stakeholder consultation (external stakeholders)	Stakeholder list for ANSP part	Revised stakeholder list	PCH SLA drafted	Done; see detailed list of meetings/ actions	Common actions and resolution of problems

Notes:

For PI 24 the RWY06/24 AGL lights are measured with a photometric method. The percentage figures are the percentage of lamps that are 50% above standard in brightness (ICAO requirement; adopted by EASA in the frame of the EU 139/2014).

Although EASA does not specify the number of times that the photometric properties of the lights are to be checked; photometric measures are done by ELE at least once per year.

SIS – FIRE BRIGADE & RESCUE SERVICE

The main tasks of SIS are the

- intervention in case of aircraft incidents / accidents;
- support to people (i.e. first aid) in critical conditions air- and landside.

SIS is also tasked with

- interventions and reporting of cases of liquid spills (fuel and other liquids e.g. oil, chemicals; in some cases interventions are done in cooperation with external partners (SIA[37]) e.g. in cases of unknown or dangerous goods requiring special equipment and protection);
- interventions in accordance with the Dangerous Goods Regulations;
- participation in daily inspections of the RWY and the TWYs;
- collection of FOD and remains after wildlife strikes (in cooperation with AER) and compilation of the reports;
- wildlife / bird strike management (in cooperation with the wildlife management cell in AER).

During winter operations SIS performs regular friction tests on the manoeuvring area and reports results to ATC, AER, AIS and PCH. The conduct of friction tests is triggered by inputs from MET.

Main documentation of SIS

The main documents for SIS are:

- **PUA[38]:** This airport rescue plan is a new document and is required for the aerodrome certification. The final version is operational since 01/06/2017.
- **SIS Manual:** The *´Manuel des Opérations SIS´* is operational since 01/06/2017.
- **PTO**: The *´Procédures Techniques et Opérationelles´* summarise the other tasks in which SIS (and other services) are involved together with other airport partners.

Further developments are expected as appropriate in the frame of the certification.

- **Winter OPS**: The functions and tasks of SIS and the interfaces and procedures during adverse weather conditions in winter in which SIS is involved are laid down in the Winter OPS document.[39]

Regulation related activities

SIS conducted workshops to conform with required standards for breathing apparatus and fire extinguisher maintenance in late 2016.

The SIS building infrastructure was adapted to increase safety and conform with legal requirements.

SIS continued to provide inputs and documents to the aerodrome certification process.

All of these activities are required for compliance with the aerodrome regulation.

SIS provides the validated reports of the friction tests results to ATC, AER, AIS and PCH for their follow up and action as appropriate and provides detailed reports on fuel spills and FOD for analysis and devise improvement actions and reported the findings to management.

KPI 17 – performance results

A further revised version of the KPI / PI form was set up with SIS and AER to reflect the latest revised structures and reporting lines. The form was finally agreed and signed by the respective parties and gives clear targets. For the results of SIS in the frame of the AER working arrangements the reader is referred to Chapter 1.9 and Tab. 15:

- FOD classification and reporting (in an agreed report format) and
- friction testing is firmly described and laid down;
- SIS gathers all reports in a central register. The analysis of the reports and reporting to management is done by AER.
- Fuel and other spill reports are handled by SIS with a detailed analysis and management report.

Table 15 provides an overview in the PI achievements for 2016 (full year).

PI 38 – emergency response time: SIS demonstrated its capability in keeping in line with the target set for intervention time, a major target also in regard to ICAO requirements.

All teams performed the exercises with good results in 2016 again.

SIS the exercises were revised in view of the EU 139/2014 and EASA AMC requirements.

Common PI 1 – Rescue & Fire-Fighting (RFF) competence

The requirements of the EU 139/2014 and EASA are to be rolled out and SIS started to implement corrective actions concerning trainings and competences in a dedicated working group.

In 2016 a number of RFF personnel received further training. The competence base is building up and motivation of RFF staff to acquire and demonstrate

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37 *Service d´incendie et d´ambulances de la ville* (Luxembourg)(SIA)

38 PUA = *Plan d'Urgence Aéroportuaire*

39 ANA (2016), Winter operations process. (Revision document, last release March 2016).

increased skills are important enablers for the future.

The Consense training module has now been set up. The HudInvent SW will also keep training records for SIS staff.

SIS still maintains a paper-based version of the training record as per member of staff.

Common PI 2 – service level coverage by RFF

Following the audit in autumn 2015 SIS started to investigate the service (security) level requirements and will step-by-step adjust the competence and service schedule.

Common PI 3 / PI 4 – stakeholder consultations

SIS contributed and contributes to the aerodrome manual under development as part of the certification process.

Staff training & competence

In order to comply with the requirements of commission regulation (EU) 139/2014 in relation to trainings and competence of SIS, efforts continued during the reporting period.

A working group dedicated to the “trainings” theme was created to identify, prioritize and implement actions.

The main action is still to define a training program for SIS agents and the designation of internal trainers and assessors.

This work extends until 2018.

SIS Strategic initiatives

The Annual Plan 2015-16 states three next step items in regard to the strategic initiatives for SIS:

- Participation in the discussions / coordination with national rescue service re-organisation and integration (CGDIS).

  Status: ongoing – SIS is following the developments.
- Continued preparation for and support to aerodrome certification work.

  Status: ongoing, SIS delivered the contributions as required.
- Training and competence development in line with EASA requirements to continue.

  Status: ongoing.
- Clarification of organisational and institutional arrangements for SIS after high-level stakeholder decision.

  Status: ongoing.

Table 15 - SIS – KPI & PI Achievements 2014 – 2016

KPI 16 Conformity / reliability of airport SIS safety critical services- Development & Status 2014 - 2016						
KPI	**Conformity / reliability of airport SIS safety critical services**	**Measure-ment Unit**	**2014**	**2015**	**2016**	**Target**
PI 38	Emergency response time (Equipe 1)	Min	17/01/2014 02:42	10/04/2015 03:20 16/11/2015 02:58	26/8 - 2:40 (24) 23/9 - 2:04 (24) 5/10 - 2:39 (24)	< 3 min
	Emergency response time (Equipe 2)	Min	03/03/2014 02:29	07/04/2015 02:43 21/10/2015 02:54	31/8 - 2:50 (24) 6/10 - 2:05 (06)	< 3 min
	Emergency response time (Equipe 3)	Min	01/07/2014 03:25 24/12/2014 02:45	08/04/2015 02:53 09/11/2015 02:25	29/3 – 2:50 (24) 21/9 – 1:56 (06) 7/10 -2:34 (24)	< 3 min
	Emergency response time (Equipe 4)	Min	03/07/2014 02:19	09/04/2015 02:54 09/12/2015 02:55	14/3 – 2:32 (24) 30/3 – 1:48 (06) 25/8 - 2:35 (24)	< 3 min
PI 1	**Common PI:** **Maintain and develop firefighting and rescue competence and medical fitness**		**2014 status**	**2015 status**	**2016 status**	SIS training plan completed for all staff (100%) and duty plan aligned with service security level and operational requirements (ensure that airport remains operational)
Action	Ensure conformity of the SIS competence scheme and training plan with the agreed level of security and operational need and in line with EASA requirements	%	Regular training according to current service scheme	The training and competence scheme is being reworked by a WG to meet the new certification requirements	Training records kep (paper versions)	
Action	Maintain personnel (´carnet personnel´) and training records stored in Consense (new Consense Training Modul) and in line with EASA requirements	%	Regular training according to current service scheme	Training plan 2015 established and implemented	Training records kept on paper; aligned with requirements Consense / HudInvent SW to be implemented	
PI 2	**Provide adequate firefighting and rescue capabilities in line with operational requirements of the airport/users at that time**					SIS duty plan shall be aligned with service security level and operational requirements
Action	Establish and agree level of security and operational need (CAT) with stakeholders / airport users		NA	Stakeholders list set up & evaluated in collaboration with SAF Unit	Ongoing	
Action	Review and align the RFFS duty plan accordingly and as appropriate		NA	Ongoing – the duty plan adapted in a WG according to the C2 FPA audit results (autumn 2015)	Duty plan finalised in Apr 2017	
PI 3	**Maintain regular consultation and exchange with SIS internal customers / stakeholders**		**2014**	**2015**	**2016**	All relevant interfaces identified, defined and coordinated with respective other units and integrated in the Aerodrome Manual
Action	Compile records of all relevant internal meetings		NA	NA	Done	
Action	SIS to provide relevant inputs to the Aerodrome Manual (part of AER)	Completed & accepted inputs	Started in late 2014	Done in collaboration with the Safety Unit	Ongoing	
PI 4	**Maintain regular consultation and exchange with SIS external stakeholders**					All actions defined, coordinated and resolved with external parties as appropriate
Action	SIS to define / record "Einsatzmängel" stated in "Einsatzbericht der Flughafenfeuerwehr" including actions taken together with external parties (i.e. LuxAirport, Luxair, Cargolux)	Completed & analysed reports	ICAO exercise performed; issues and observations recorded	List established and analysed, several corrective actions done as consequence – 2014 ICAO exercise issues have been tested, part exercise foreseen for 14/7/2016	List of 2016 issues established and analysed; 2016 ICAO exercise issues have been recorded and are being treated with the external parties	dto
Action	SIS to maintain the central records of FOD and fuel spill reports SIS interventions (fire & technical interventions) (reported in the AER KPI an chapter of te AR)	Completed & analysed reports	FOD data compiled and ananlysed (with AER)	2015 FOD and Fuel Spill Reports available; actions derived from reports and implemented	2016 FOD & Fuel Spill Report available	dto

PROJECT MANAGEMENT IN OPERATIONS & INFRASTRUCTURE

Project Management (PM)

The Programme Management Office (PMO), established in 2012, continued and advanced in 2016 – 2017 with the implementation of further PM tools and procedures, regular internal project reviews as well as direct and indirect project support to all departments.

The current project portfolio of the PMO includes both ATM and Aerodrome related projects.

Programme Management

ANA has a defined and implemented programme, project management methodology and group structure in place to manage and lead project work.

The Strategic Management Team (SMT) assigns project leaders and resources to projects.

The tasks of the PMO and of the Compliance Management function is to:

1. set-up, technically manage assigned projects in line with PM practices and procedures and create, maintain and update project information/ documentation;
2. establish human resources and other requirements;
3. report progress to the SMT on status, progress and risks against established criteria and requirements;
4. assess the impact of changes to the plan and check compliance with mandatory and agreed criteria;
5. coordinate with the departments, projects and outside parties as appropriate and as required by the work at hands.

The details of the PM programme, training and management tools etc. are laid down in separate documents and integrated into the IMS Manual.

PMO issues & performance results

The managing of the portfolio of projects, the ensuring of progress according to schedule, budget and resources are normal PM tasks but are still not easily achieved. Maintaining progress in line with the plan was particularly difficult during this reporting period due to pending decisions.

Substantial delays in finishing projects are still observed as the comparison with the Annual Plan 2016-2017 and the project list in Tab. 17.

Some important factors continue to be of concern throughout the lifecycle of projects:

- Pending authoritative decision and / or regulatory support in projects that require policies and institutional decision or regulatory guidance and support;
- delays in the start of the tendering process due to pending decisions (examples are eTOD, SUR chain upgrade);
- delays in required external civil engineering work and extended coordination with external parties;
- extended transition periods for testing / shadow mode operations or continuation of non-compliance with technical requirements;
- time needed for a correct and complete identification and establishment of technical requirements;
- legacy projects not developed and planned according to current ANA PM standards.

The last three bullets are now more and more in decline. However, the first three items continue to be of major concern.

ANA has spent efforts in bringing problems in projects to the decision table at all levels. This has helped the progress.

The efforts to control project budgets and expenses are well spent and have helped to reduce delays and costs.

ANA PMO is also investing efforts in providing **PM tools** and **training** for project leaders and staff. This program will continue.

In May 2016 PMO started to introduce **Project Risk Management** procedures and tools (i.e. risk assessment; root cause analysis; risk management / mitigation etc.) and has implemented this successfully. The remaining actions will be in place by the end of 2017.

Program & PM process improvements

Project launch & approval: Project leaders are required to fill the Project Change Request Template (PCRT) before the SMT decides on the project. All KPAs are in focus when justifying a project.

The aim is clearly to have a concise but precise and complete set of requirements to be met, resources needed and performance indicators to be observed. Risk management will be included in this assessment by the end of 2017.

Documentation: The PM system and support tool for all project leaders and workers is a software (SW) tool called PMTalk.

The tool is accessible for updates and upload of documentation. The project status has to be flagged (e.g. delay is flagged red) to make sure issues can be resolved and or escalated to the next level for resolution as soon as possible. The SW allows tracking the items in question.

Through regular ´Project Cockpit Reviews´ at project leaders meeting (quarterly) and in the SMT (monthly) projects are discussed and their status confirmed. This practice has helped to identify problems earlier, find common solutions and derive actions to advance.

Resource planning & execution: The correct estimation of the financial (and other) resources is important to achieve project cost effectiveness and cost efficiency. The tools and processes in place in the financial area help to track project budgets and payments effectively.

Project leaders need to provide the estimates in the PCRT on project costs on two budget lines:

- Investment costs (CAPEX);
- Operational costs (OPEX;

Project leaders receive guidance when providing these estimates and using the correct ´*assiette de redevances*´ codes.

These measures are closely coordinated with the Financial (FIN) department and required changes to the tools employed and tasks to be performed in the department.

ANA is now fully able to save costs and resources and actual efforts spent are visible to all parties.

Procedures: Besides quarterly meetings of project leaders and using PMTalk, ANA PMO introduced during the Q3/Q4 2016 the risk management methodology related to project management.

A new dedicated timesheet PMTalk module to estimate and track project efforts (man-hours / actual man-hours needed for projects) is currently tested and will be implemented officially in the Q4 of 2017.

PMO achievements in KPI 19

The PMO adopted during the 2015 KPI review session measures to track the performance of project management and execution in terms of two important PIs:

- The finalisation of planned projects according to plan (**PI 51**) and
- Project expenditure according to planned project budget (finance) (**PI 52**).

The year 2016 saw some important finished projects (see Tab. 17 overleaf).

In 2016, a total of seven projects could be finalised out of ten projects planned to be finalised.

Finance planning & execution

During the second half of 2016 and continuing into 2017 the process to retrieve the financial data and compile the expenses has further improved. The goal to have tools and procedures in place to provide financial information on projects on ´the click of a button´ has come very close:

- Available budget, budget spent (expenses);
- running purchase orders / invoices and
- remaining project funds as per budget code

are now at the hand of project leaders, PMO and the finance department.

The results in 2016 in **PI 52** are in Tab. 16):

From a total of seven projects finished with a total budget planned of 359 k€ 13% less was actually spent.

PMO is now able to monitor the initial project budget estimation against actual amounts spent in order to establish a reasonable target on the PI in future.

Table 16 – Project Management - KPI achievements against established PIs 2014 – 2015 (full years)

PMO SERVICE - KPI # 19 - Maintain quality and efficiency of Project Management - Achievement 2014 - 2015					
KPI 19	**Maintain quality and efficiency of Project Management**	**2014**	**2015**	**2016**	**Target**
PI 51	Maintain integrity of ANA project management procedures & processes: - Number of projects finished / planned to finish	13 projects out of 18 planned finished (72%)	22 projects out of 26 planned finished (85%)	7 projects out of 10 planned finished (70%)	75%
PI 52	Effectiveness of project costs to project budget: - Actual project costs / planned project costs per annum (finished projects)	Development of approach for Actions 4 & 5	Actual costs were 27% lower as planned	Actual costs were 13% lower as planned	+-10%
	Common PIs				
PI 1	Maintain and develop competence of staff in PM Action: Implementation of PM training plan for project leaders and teams	Planning of courses	Training of Modules 1-3 finalised	5 training sessions program mgmt.	100%
PI 2	Maintain regular consultation and exchange with ANA internal stakeholders / customers Action: Hold quarterly project leader meetings	3 meetings held	3 meetings held	8 meetings held	100%
PI 3	Maintain regular consultation and exchange with ANA external stakeholders / customers	Achieved	Done - full presentation of planned projects to AUC in autumn 2015	around 15 meetings held	100%

PM competence & stakeholder management

The program for PM training of project leaders and teams was developed, communicated and agreed.

Regular meetings with teams (internal) and with stakeholders (external) were held during the reporting period.

ANA - Project overview and status

Tab. 17 gives an overview on the Status of finalised projects, ongoing projects, as well as those on hold or planned but not yet started (both, ANSP and AER related[40]).

> Note: Status of projects in the table lists only major projects that started or were finished in 2016 up to and including projects that finished until the end June 2017.

FABEC: The airspace project SWAP in which ANA participates is still on hold. The CDO project is further delayed (see previous chapters for more details) but progressing.

SESAR ATM MP: ANA follows SESAR Deployment Programme (SDM) developments closely and reports on the status of developments in ANA to the SESAR Deployment Manager (DM).

Most SDM projects in the SDM 2017 document[41] are not applicable to ANA besides SWIM network related items in which ANA will mainly invest in the coming years.

Network infrastructure: The relevant measures as regards network infrastructure are in place. The renewal / replacement of the internal and external network infrastructure is now part of the ANA – DFS technical cooperation programme 2017 - 2027.

The Common Network Group (CNG) in which ANA participates and the participation at senior management and CNS level in the NewPENS[42] acquisition project ensure strategic input and coordinated decision making on some medium to long-term projects that are and remain to be essential for ANA.

[40] For details on the ANSP and AER projects see the respective chapters in this document.

[41] SESAR Deployment Programme (2017), Draft. Brussels: DM.

[42] NewPENS = New Pan-European Network Services is a procurement project at the time being managed by Eurocontrol and concerns the replacement of the current PENS; this is an important milestone in achieving the SESAR requirements on SWIM.

Table 17 - Projects finished / ongoing / on hold in the period 01 July 2016 – June 2017

# & Status	Project Name	Service	Status	End date	Scope	Reference EU / ESSIP / ICAO / KPA
009 – Level 1	**A-SMGCS** –Level 1	ATC / CNS	Level 1 finished; in shadow mode operation	2017 Ph.1	SESAR ATM MP	AOP04.1 / ATM MP SAFETY
009 – Level 2	**A-SMGCS Level 2**	ATC / CNS	Level 2 not yet started; planned	TBD	SESAR ATM MP	AOP04.2 SAFETY
171	***New*** **A-SMGCS APP info screen**	ATC	Implementation	2017	SESAR ATM MP	Provides a view of A-SMGCS data to APP to increase APP situational awareness concerning ground traffic
165	**Digital ATC Briefing System**	ATC	Study	2017	Internal	AIS / MET briefing system
172	**Intersection take-off Echo RWY06**	ATC	Definition	TBD	Internal	Allows M type aircraft to depart from intersection E when runway 06 is in use; CAPACITY
083	**ELLX APP Control CDO** – Continuous Descent Operation	ATC	Procedures developed, implemented and trials ongoing	2017	SES / FABEC	EU 390/2014 (performance) FABEC Performance Plan (FPP) ENVIRONMENT
162	**FATO - Final Approach and Take Off area** implementation	ATC	On hold	2017	ICAO	AER certification related
155	**ETET** - SID[43] to ELLX RWY24/RWY06 FABEC "South East".	ATC	On hold	TBD	SES	FABEC AD Project (SWAP concept)
121	***New*** **SUR Chain Upgrade**	ATC/CNS	Started; contract agreed	2018	SES ATM MP	ITY-IOP SAFETY
130	***New*** **MUAC fallback radar display**	ATC/CNS	Implementation	2017	SES	Replacing actual radar fallback display and using the MADAP radar tracker data from MUAC; SAFETY
157	**Replacement of the Radio Backup System (RESQ)**	CNS / ATC	ANA/DFS Project	End 2017	SES	Continuity of service / redundancy SAFETY
161	**ATC Building renovation**	CNS /ATC	Finished	2016	Internal ANA	Maintenance of OPS building
130	**MUAC fall-back display**	CNS / ATC	Implementation	2017	SES	EC 1035/2010 Annex 2 – Contingency solution TWR
065	**Direction Finder (DF)**	CNS	DFS / ANA Project	2018	SES	Replacement of old system SAFETY
068	**SDDS** – SUR Data Distribution System	CNS	DFS / ANA Project	2017	SURNET / SES	SURNET agreement / SAFETY (Contingency) EC 1207/2011 (IOP)
136	**ATM architecture virtualisation**	CNS	On hold	TBD	SES	EC 1207/2011 (IOP)CNS Contingency / Redundancy /Replacement (SAFETY)
013	**E-TEC** new Server Building	CNS	Implementation	2017	SES	CNS Contingency / Redundancy (SAFETY)
145	**Video briefing Terminal A**	MET	Finished, wait [44]endorsement	2017	SES	SAFETY
075	**Replacement wind sensors**	MET	Finished	2017	SES ICAO	EU 139/2014 Replacement of current system SAFETY
079	**Camera for monitoring of meteo (MET) observation**	MET	Implementation	2017	NA	Connected with AWOS QUALITY (weather observation)
046	**ATIS – Emergency Message**	MET/ ATC	On hold	2016	SES	Contingency procedure ´Clear the sky' related SAFETY

[43] Standard Instrument Departure Route
[44] Advanced Surface Movement & Ground Control System

Table 17 – Cont´d

# & Status	Project Name	Service	Status	End date	Scope	Reference EU / ESSIP / ICAO / KPA
103	**Modernisation Bureau MET**	MET	Finished	2017	Internal	MET office refurbishment and re-organisation
167	**MeteoFactory**	MET	Implementation	2018	MeteoLux	Meteo France product implementation
114	**Lightning Detector**	MET	Ongoing	2017	None	Implementation in network with Belgocontrol MET
019	**SYNERGIE – programme update**	MET	Finished	2017	MeteoLux aeronautical & public	NA
156	**CliSys servers renewal (Climate system)**	MET	Finished	2017	NA	Replacement of old system COST-EFFICIENCY
158	**AWOS/ATIS Test-bed installation**	METTECH[45]	Implementation	2017	Related to Project # 022	Service continuity SAFETY
159	**AWOS / ATIS Software upgrade**	METTECH	Implementation	2017	Related to Project # 022	Service continuity SAFETY
129	**CNS & MET Network architecture**	METTECH	ANA/DFS Project	2018	SES	ıment increase reliability, redundancy, IOP
120	**Electro-tech stations at Gates 06 / 18 / 24**	ELE	Implementation	2018	SES ICAO	Continuity of service; PWR supply SAFETY
118	**Electric distribution Glidepath RWY 24**	ELE	Implementation	2017	SES ICAO	EU Reg 139/2014 SAFETY
069	**Fibre optic and copper cable distribution**	ELE / ATC	Implementation	2017	NA	Related to A-SMGCS – establishment of connectivity
069	**Fibre optic and copper cable distribution**	ELE / ATC	Implementation	2017	NA	Related to A-SMGCS – establishment of connectivity
089 & 055	**Main Power Station South**	ELE	Implementation	2017	NA	Continuity of service - Power supply/ redundancy SAFETY
055	**Cables Station South**	ELE	Finished	2017	AER	Service continuity – Power supply / redundancy SAFETY
110	**APPROACH 06 masts frangibility**	ELE	On hold	TBD	ICAO Aerodrome	ICAO requ. For aerodromes SAFETY
110	**Support structures implementation of frangible masts APP 06**	ELE	On hold	TBD	ICAO / SES	EU Reg 139/2014 & ICAO requ.
147	**PANS OPS Software**	AIS	Definition	2016	SES ICAO	EU 139/2014 (ICAO) – Certification SAFETY
078	**eTOD** – electronic Obstacle & Terrain Data - Photogrammetry	AIS	Tender launched; Further decisions pending	2017 / 2018	SES	EC 73/2010 (ADQ) / AIP BE LUX Core data SAFETY / ENVIRONMENT
147	**PANS OPS Software**	AIS	On hold (pending eTOD)	2016	SES ICAO	EU 139/2014 (ICAO) – Certification SAFETY
163	**Implementation of "HuD-Invent" software**	SIS	Implementation	2017	Internal	SIS specific SW

[45] MET TECHnical service

Table 17 – Cont´d

# & Status	Project Name	Service	Status	End date	Scope	Reference EU / ESSIP / ICAO / KPA
010	**SIS Training Platform**	SIS / AER	Study	TBD	AER Project	SAFETY
0054	**Full integrated briefing** AIS MET	AIS / MET	Finished	Mar 2017	SESAR ATM MP	INF04 / ATM MP
164	***New*** **Upgrade Consense version 10.6**	SAF /ADM (training)	Implementation	2017	ANA Internal	Required for the tracking / update and control of all training of staff, SAFETY, QUALITY
168	***New*** **Bon de Commande program**	ADM / FIN	Implementation	2017	ANA Internal	SW tool for management and monitoring requests of engagement / purchase orders starting at the identification of a need up to the delivery and payment of the goods / services
140	**Spare parts management program**	ADM / all ANA Dpts	Implementation	2017	NA	Service continuity / availability management of spare parts
169	***New*** **Feasibility study on the Run-up area**	AER	Study	TBD	Aerodrome project	Feasibility study on the up area needed after refurbishment of India to be used as a TWY
112	**RWY / TWY refurbishment**	AER	Definition / Planning / Negotiation (pending State decision, PCH)	2017 / 2019 / 2020	AER Project lux-Airportr	Airport continuity of service; planning and negotiation ongoing SAFETY / SECURITY
137	**Aerodrome Certification**	AER	Implementation	2017	SES EASA	EU Re 139/2014 (EASA) Requirement
150	**Lot 62 – Parking station route de Treves**	AER	Finished	2016	AER project	SECURITY

Legend:
green = finished;
amber = past planned but not yet started;
yellow = ongoing implementation;
pink = on hold (mainly due to ongoing decision making on responsibilities for AER projects.

The table lists the major projects most of which were published in the Annual Plan (see: ANA (2016) *ANA Annual Plan 2016-17,* Luxembourg: ANA); some new projects approved and started during 2016-2017 are added in the table indicated by ***New***.

QUALITY MANAGEMENT

ANA QM framework

ANA is certified under quality system ISO 9001 and operates in accordance with an established Quality Management System (QMS) and IMS Manual (IMSM).

ANA QMS is responsible for the development, maintenance and revision of the internal QM structures, procedures and processes in all services and at all levels of ANA. This includes:

- *Facilitation of internal communication* – coordination between safety, quality, PMO, security, environment, training and related processes.
- *Organising management process review meetings* – annual reporting and review of all internal management processes.
- *Organising KPI review meetings* – annual reporting and review of departmental KPIs, PIs, performance targets, actions and setting new / revising existing performance indicators.
- *Conducting internal audits in different services* – providing support to quality improvements and feedback on achievements and processes / procedures.
- *Preparation of external audit* (EASA, DAC) meetings as scheduled – follow up, develop corrective actions and coordinate with DAC.
- *Preparation and follow up actions from ISO 9001* audits.
- *Organising internal quality management processes* – meetings with quality officers for quality improvements, corrective actions and follow up after audits.
- *Supporting organisational structure* – detailing of job responsibilities, training, security and safety questions for assigned officials.

The internal processes are documented and included in the IMS manual; revisions and updates are done annually.

The highest level management board is the Executive Committee **(COMEX)** convened by the Director of ANA.

COMEX is charged to decide management actions driven by stakeholder decisions on legislative or regulatory changes, contractual and financial matters of high importance, safety, performance, environment and quality management.

Performance & management processes

Annually in April, one full day meeting is held during which departments / services report on their performance against PIs, targets and specific actions taken in the past six month. The meeting is organised and convened by QM. All services and departments of ANA provide their reports on performance results, actions and proposed next steps in the coming 6 months.

ANA management participates in the meeting and discusses the reports on the KPI results and on the effectiveness of the management processes for:

- Safety;
- Quality;
- Security;
- Environment;
- Project management;
- Financial management;
- Management of performance, and
- Strategic business management.

This review process also provides the inputs for the update or revision of the KPIs, the Annual Report and the Annual Plan and has proven to be effective.

KPI 17 - Results in QM 2016-17

The following sub-chapters provide the results in the KPI 17 for QM and Tab. 18 provides the summary of all PIs and actions for 2016.

PI 39 – Integrity of safety reporting

QM also follows the safety reporting system and records for their integrity. The results in Tab. 21 show, that the number of reports has gone down to a total of 90 filed reports.

In 2014 the total number was 134 reports. Especially external occurrences and bird strike reports has been reduced considerably.

PI 40 – QM Integrity: Internal audits

Internal audits are planned and scheduled on an annual basis and agreed with the respective services / departments.

A team of trained internal auditors conducts the internal audits; the list of senior and junior auditors is published internally. A definition of the task of the focal point for the audits and the auditor team is published internally.

After audits Non Conformities (NCs) and observations are placed on a so called “dashboard” to monitor corrective actions and to track audit results.

In 2016 eight internal audits were planned of which seven were conducted in different departments and services. A total of 20 findings emerged from the audits whilst six findings were resolved and could be closed.

PI 40 – QM Integrity: External audits

Three external audits were held in which QM was involved. The results overall were positive:

- The conclusion of BSI audit is that the audit objectives have been achieved and the certificate scope remains appropriate. The audit team further concludes - based on the results of the audit - that ANA fulfils the standards and audit criteria identified within the audit report and that it is deemed that the management system continues to achieve its intended outcomes.
- The audit team recommends that BSI consider the information found in this assessment report as evidence in part, of the conformity of ANA with the requirements for ISO 9001:2008 continued certification. There were no outstanding nonconformities to review from previous assessments. No new non-conformities have been identified during the assessment.

The process for the management of external audits is defined in the IMS manual.

Table 18 – QM - KPI results / achievements 2013-2016[46]

QUALITY SERVICE - KPI 17 - Maintain Quality Management System - Achievement 2013 - 2016						
KPI 17	**Maintain quality mgmt system**	**2013**	**2014**	**2015**	**2016**	**Target**
PI 39	Integrity of aerodrome safety reporting					
	External occurrences / safety reports	72	67	No data	45	No target set
	Laser attacks	NA	7		4	
	Birdstrikes / suspected birdstrikes	NA	36		17	
	TCAS warnings	NA	3		1	
	Others	NA	21		23	
PI 40	**Integrity of QMS**					
	# Internal audits (done)	NA	12	8	7	No target set
	# of findings	NA			20	No target set
	Closed findings	NA			6	
	Open findings	NA			14	
	# External audits	NA	2	0	3	No target set
	# of findings (NCs/OBS)	17	3	16	16	No target set
	Closed findings	NA	18	9	6	
	Open findings		15	13	12	
PI 41	**External communication on ANA**					
	# of articles in press	NA	NA	15	15	No target set
PI 42	**Local resident complaints**	NA			No data	No target set
Common Pis						
PI 1	Maintain and develop competence of staff on quality matters	NA			Trg. for auditors done	Impl. of QO and QM (2016)
PI 2	Maintain regular consultation and exchange with ANA internal customers / stakeholders	NA			Rregular annual internal audits; QO in dept.	6 QO meetings/ annum
PI 3	Maintain regular consultation and exchange with ANA external stakeholders	NA			119 suppliers assessed in 2016 particip. in IntACT	1 AUC meeting / annum

[46] The KPI / PI for QMS were developed over the past years; some PIs have been introduced during the 2016 KPI review cycle.

Common PIs

QM competence – QM is regularly conducting training sessions for auditors.

QM internal consultation – the work of the QM function by its nature stretches out to all internal services and departments.

The Quality Officer (QO) meetings held throughout the year (six in total) and the audits (internal and external audits) performed are already sufficient points of contact and consultation with internal parties.

QM also participates in all internal and external management meetings (i.e. safety, security, SMT etc.) that ensure a good network of exchange and consultation on all quality aspects.

QM external consultation – QM participates in and organises some external consultation meetings with stakeholders or partners.

The most prominent example is the Airport User Committee (AUC) held at least one time per year. These meetings require good preparation by management, the financial department, ATC, SMU, performance management functions and QM to provide in-depth information and results of importance to users.

The most important items on the agenda are reports and discussions on

- ANS charges;
- performance results;
- aerodrome infrastructure developments and projects;
- ANS operational plans;
- ANS / AER service evolution;
- Safety, environment and quality.

QM participates with SMU in the **IntACT** program of the SAF Steering Group (SG) in FABEC.

QM assists in meetings with local residents aimed to inform about environmental aspects of concern to them, to listen to their issues and concerns and answer questions.

QM intends to do regular surveys (one was due in 2016 according to the plan) of customers.

Strategic KPI – KPA mapping

ANA QMS also keeps an eye on the strategic objectives in performance management. Departmental KPIs also aim to achieve the wider (general) Key Performance Areas (KPAs).

Tab. 19 (next page) presents this mapping of KPI results against KPAs and the progress achieved and gaps remaining from this strategic performance perspective.

Table 19 – Mapping of main actions and results in departmental KPIs / PIs against Key Performance Areas (KPAs), corrective actions and performance gaps

KPA	KPI / PI	Strategic goal	Strategic actions	Achievement 2016-17	Gaps existing
SAFETY	Effectiveness of Safety Management	ANA to continue to maintain / improve the effectiveness and integrity of its safety system	Establish annual Safety Plan Develop SAF policies Inputs from State Safety plan Prepare for external and internal audits	SAF Plan nearly fully completed SAF system works	Work on some policy and objectives is ongoing State SAF plan still pending
SAFETY	Severity of occurrences	Classification of severity of ATM occurrences	Rating of all SMIs, RI, and ATM SEs Develop action plan for occurrences as appropriate	SMIs and RIs and ATM –SEs assessed and reported	This is an ongoing activity
SAFETY	Just Culture (JC)	Improve Just Culture in ANA	Monitor, record and assess JC occurrences Provide statistical feedback Develop and maintain JC policy	JC policy available and applied	ANA target achieved State (juridical system) actions are still required
SAFETY	Contingency measures	Contingency (minimum) in case of shutdown of operations	Establish "Clear the Sky" procedures Install fall-back facilities for ATC, AIS, CNS, MET	None – The goal was achieved in past reporting period.	No Item CLOSED.
SAFETY	Software Safety Assurance System (SSAS)	Achieve compliance with EU Regulation	Pass regulatory audit	Goal achieved in past reporting periods New arrangements are set up in the frame of the DFS – ANA technical cooperation framework for future cases	No
SAFETY	Reliability of safety critical ATM systems	Achieve / maintain a highly reliable interoperable ATM system	Resume reliability and interoperability of radar system (TAR1 / TAR2) Replace old / implement new systems as required	Contractual measures taken with suppliers in 2017 for TAR2 upgrade 10-year technical implementation plan for renewal of entire ATM system with DFS established	Yes IOP of TAR2 not yet achieved; implementation ongoing
SAFETY	ATM ground contribution to incidents	Decrease ATM ground contribution to incidents	Establish / maintain safety monitoring, assurance & reporting system	Targets achieved; no further decrease in incidents in the reporting period in ATM ground contributions to incidents	No
ENVIRONMENT	Environmental impact	Decrease environmental impact of flying	Implement CDO procedures at ELLX with Belgocontrol	MoU agreed and signed with Belgocontrol; procedures developed, implemented and in trial; CONOPS available (draft) Planned for all inbound routes to ELLX (ongoing)	Yes Official trails in Q4 2017 planned; final endorsement of procedures / CONOPS for CDOs installed still pending

Tab. 19 – Cont`d

KPA	KPI / PI	Strategic goal	Strategic actions	Achievement 2016-17	Gaps existing
COST EFFICIENCY	En-route and terminal costs	Achieve cost allocation / recovery for ER & TNC in line with EU Regulation	Achieve / maintain correct & transparent ER & TNC cost allocation & charging mechanism Achieve approval of TNC modulation / cost recovery method in place in 2017 monitoring exercise	Correct, transparent and complete cost and revenue tracking achieved ER/TNC cost allocation & recovery approved by PRU	No Presentation to AUC planned in autumn 2017
COST EFFICIENCY	Aerodrome costs	Achieve cost allocation / recovery for aerodrome	Achieve / maintain correct, complete & transparent cost allocation mechanism in COM and SUB for aerodrome activities and infrastructure Achieve approval by State authorities	Comprehension of financial processes & tools for aerodrome costs achieved Finance plan / proposal issued to State authorities	**Yes – still ongoing** Pending decision on AER financing No dedicated AER budget assigned.
COST EFFICIENCY	Investment costs	Establish new investment plan for ANA (ANSP)	Establish complete ANS investment plan for remaining RP2 (2017 – 2019) and beyond Achieve approval by State authorities	Investment plan established Investment plan integrated in FABEC Performance Plan Cost for ANA-DFS technical collaboration 2017 – 2027 established and endorsed by State authorities	**Yes – still ongoing** Impacts for ER and TNC cost allocation & depreciation not known / not decided.
QUALITY	Quality management	Ensure the integrity of all reporting exercises in ANA related to QMS	Perform internal & external audits Monitor compliance / adequacy of procedures for safe and efficient operational practices	Audits performed	Yes No immediate gap existing Continuous activity
SECURITY	Security management	Ensure the integrity of all measures in related to security	Establish concept, methods and implementation plan for security Identify immediate security risks	Implementation started Organisational items to be resolved	**No – still ongoing** Continuous activity

OTHER ANA SERVICES

Administrative department (ADM)

ADM is the centralised service unit supporting other services of ANA in administrative and technical tasks.

ADM consists of four units:

Maintenance (ENT) – this unit maintains and refurbishes administrative ANA buildings, is involved in the maintenance of green areas and provides driver service.

Secretariat (SEC) – this unit assists ANA in administrative and clerical tasks.

Statistics – this unit collects and publishes all relevant statistics of Luxembourg airport.

Public procurement – this unit assists ANA departments in legal advisory and administrative procedures related to public procurement.

IT unit (IT)

Starting in 2017, ANA decided to revamp completely their IT team by hiring new talents and putting in place a new IT structure.

Divided in three key areas, the IT team covers a broader range of services:

- The “Network and Security” team handles all cyber-security and infrastructure aspects
- The “Applications and Virtualization” team handles software, hardware and virtualization needs
- The “Helpdesk” team handles user problems and requests

Moreover, the ANA IT team is growing its collaboration with CTIE, a Luxemburgish State Service Provider, in all possible IT aspects. This allows ANA to benefit from the expertise of an experienced entity to further shape the IT strategy of the administration and make it future-prone.

Finally, the new IT structure will enable ANA to align and realign IT services to changing business needs that support the business processes faster than ever before.

FINANCIAL SITUATION & PLAN

Finance (FIN) is responsible for establishing, managing and monitoring budget planning, the execution, and management of the cash flow, and purchasing / paying the invoices of all ANA departments and projects.

FIN is also responsible for the correct and transparent:

- cost allocation and the methods employed;
- cost accounting as required by
  - State authorities and
  - EU charging and performance regulation;
- En route (ER) charges
  - in line with EU regulation and,
  - the charging principles of the Central Route Charges Office (CRCO) (Eurocontrol) and
  - in close collaboration with Belgocontrol for the Belgium-Luxembourg (BE-LU) FIR and charging zone;
- calculation of Terminal charges (TNC) with the modulation method, taking the traffic evolution and the effects of the modulation into account;
- approval of TNC charges and the adjustment methodology employed for traffic and modulation effects;
- establishment of the actual annual costs for ER and TNC ANS;
- establishment of the annual accounts / financial situation in the year passed in accordance with State rules for external audits.

FIN is organised as an independent unit of ANA and is also in charge for the further development and maintenance of the finance methods / tools, processes and procedures.

2016 SES related activities & results

EU Charging & Performance regulation: 2016 was the second year where the EU Regulation 391/2013 (Charging) and 390/2013 (Performance) was applied in Luxembourg.

One requirement of both regulations is to achieve compliance with the Cost-Efficiency (CEF) targets on determined costs.

The **ER** CEF measure for BE-LU charging zone was finally endorsed by the European Commission (EC) for 2015 as being consistent with the EU wide targets.

FIN established the costs and reported to EC (via DAC and PRU) the actual 2016 cost outturn on ER and TNC.

The methodology for the calculation of the traffic and modulation effect and the modulation formula itself for 2016 was endorsed by PRU.

These actions were performed end June 2017.

The framework for performance monitoring for 2016 is given through the regulation and the generic templates and forms provided by the EC to the NSAs.

Modulation and traffic effect: Art 16 in EU 391/2013 demands to report on the outcome of charges levied based on the modulation formula and a correct calculation of the effects (over-or undercharging due to traffic and due to the modulation formula employed). Possible over-or undercharged amounts shall be recovered in the next charging period, normally the year n+2 (=2018 for the 2016 exercise).

User consultation: The results shall be a subject for the annual user consultation meeting of AUC / ANA in autumn 2017. During the meeting the calculated TNC unit rate for 2018 shall be presented and demonstrated.

EU Common Requirement Regulation: The EU Regulation 1035/2011 demands the reporting of the financial situation (financial balance sheet and profit/loss accounting) in the Annual Report.

The financial situation and outturn results in 2016 are reported in Tabs. 20 and 21.

FIN strategic developments in 2016

ANA implemented and continues to implement the recommendations and structures developed in the financial system stepwise.

The effects reported in the last AR are confirmed:

- Better and correct accounting of assets;
- correct and transparent allocation of costs in line with the cost allocation scheme agreed for ER and TNC services;
- correct identification of costs (actuals) for all services rendered against revenues;
- helpful procedures and tools improve the effectiveness and cost-efficiency in book-keeping and tracking of expenses, invoicing and payment / purchasing…;
- developed interfaces and interlinking of tools to avoid manual work, errors or double entries etc. are working.

This work continued in 2016.

Budgeting Process: This work also requires the restructuring of the financial accounting process

- firstly in line with the principles in the EU regulation whilst

– secondly maintaining the budget management processes and principles applied in Luxembourg's public service organisations.

The financial authorities in Luxembourg (e.g. IGF[47]) have acknowledged that this issue is a matter for improvement and that this work shall continue.

For the time being, ANA has to continue to apply the two approaches in parallel. The methods and tools developed are helping to reduce the efforts and to facilitate this process.

FIN was closely involved in the SYNergie projects (ATC, CNS) and provided financial and other data for the Cost Benefit Analysis (CBA) in the frame of the assessment projects with Belgocontrol and DFS. The outcome is laid down in a detailed report.

FIN also delivered a strategic and operative report and recommendations on the current accounting system and future FIN structure to State authorities.

Tab. 20 on the next pages summarises the detailed goals set and actions launched / performed in FIN for the 2016 – 2017 reporting period.

Investment planning

Investments (CAPEX[48]) in technical and operational infrastructure projects are an important area directly related to the recommendations and the outcome and decision on the SYNergie project and CBA.

The Luxembourg part in the FPP assumed no major investments in 2017 – 2019 pending the decisions at high level on the SYNergie project. Immediately after the decisions were known, FIN started to consolidate the figures as required and as soon as they were available.

Based on the best available data and information FIN has established an investment plan for the remaining RP2 period (2017 – 2019).

The investment plan was updated and delivered to PRU / EC via DAC as part of the 2016 FPP update.

[47] Inspection Général des Finances

[48] Capital Expenditure

Table 20 – FIN improvement actions 2016 – 2017

Strategic items	Goals – Actions
Budgeting process	Goal: Simplification of the budget structure; clarification of commitment and ventilation rules; tracking and modification of credit-lines for projects / dept. Actions: Establish and document all main procedures and processes in FIN. Establish plan for modification of inefficiencies, errors etc. and launch changes. Continue to consolidate SUB / COM in the balance sheet 2016. Establish balance sheets for the budget year 2016. Make recommendations to MDDI/DAC) for possible improvements.
Global / per service determined costs	Goal: Check the hybrid COM / SUB vs. cost-centre approach and make proposals for improvements. Actions: Continue to establish all costs 2014 – 2019 for global costs and costs per service. Identify (currently) uncovered costs for services rendered by ANA (AER, VFR): Make recommendations to MDDI/DAC) for possible improvements[49]:
Financing of services	Goal: Establish revenues ER and TNC, State dotation and uncovered cost parts. Actions: Actual costs 2016 vs. planned costs in FPP (EU monitoring exercise June 2017). Amortisation of assets (done and crosschecked). Financing of Aerodrome costs (current situation vs. future) clarification and legal requirements. Financing of RWY refurbishment (this task is now transferred to lux-Airport and the *Administration des Ponts & Chaussées (PCH)*). Make recommendations for improvements to MDDI/DAC.
BOB **Accounting system**	Goal: Retrieve data from SAP for ANA internal use. Actions: Continue the simplification (automation as far as possible) of steps to transfer data. Document processes / procedures and train (new) staff.
Overdue accounts / unpaid bills	Goal: Identify unpaid bills and clarify / define steps in monitoring and control Actions: Establish amounts since 2009. Establish procedures and rules.
Purchasing process	Goal: Clear rules and procedures to be followed in all purchases/ contracts (by Purchasing Process Coordinator). Actions; Revise rules and procedures for purchasing of goods and services.

[49] A full report of the entire exercise is available and is issued to MDDI /DAC in April 2016 (ANA, 2016; Proposition d´une nouvelle structure comptable et financière. ANA, April 2016).

Table 20 – Cont`d

Strategic items	Goals – Actions
Invoice management	Goal: Clear rules and procedures (by Purchasing Process Coordinator). Actions: Revise rules and procedures for invoicing. Avoid outstanding orders.
VAT	Goal: To submit a correct VAT declaration. Actions: Perform semi-annual checks of all accounts and invoices to comply with Luxembourg VAT law. Establish according mechanisms and tools.
TNC	Goals: Check and re-calculate TNC in line with EU Regulation, ensure correct function of TNC modulation, achieve endorsement / approval of DAC / MDDI / PRU / EC Actions: Calculate TNC 2016 outturn, carry overs and adjustments for traffic / modulation. Calculate TNC 2018. Make recommendations for improvements to (MDDI / DAC). Report agreed methodology and calculation to users (AUC).
Follow-up on MDDI decision - SYNergie project	Goal: To assess financial impacts (costs; investments; cost allocation) of MDDI decisions. Actions: Establish cost estimates and correct allocation of costs. Establish investment plan for RP2 (and beyond) for all known investments for the Business Plan and the FPP (2017 revision). Establish likely impacts in budget terms. Make recommendations to MDDI[50] if possible.

Note: Reported are the achievements on strategic initiatives in 2016/17.

[50] Full report on the SYNergie CBA and offers received by ANA delivered in April 2016 to MDDI.

Results in FIN KPI performance

During the KPI and management reviews in 2016 further ANA internal and external issues were surfaced and discussed and further steps agreed upon.

The KPI review 2016 (April) clarified that the current Cost-Efficiency (CEF) targets for ER, TNC and AER costs lacked a reliable and valid basis and could not be achieved. The outcome of the final exercise for 2015 in the frame of the PRU Monitoring 2015 exercise indicated that actual costs were substantially higher than determined costs for 2015.

It was acknowledged that the strategic recommendations as outlined in the report (see footnote 45 below) including the CBA on the SYNergie need first to be decided by State authorities before a proper KPI on CEF for the three service areas can be established.

Tab. 21 lists the results against PIs in KPI 12 – 14.

The status of achievement against the cost saving targets in **KPI 12** (**ER & TNC**).

PI 29: Although the target to reduce DC by 3,3% / annum was not reached, the En Route (ER) Determined Costs (DC) are consistent with EU wide targets after agreements were reached with EC in the end[51].

Given the specific conditions the cost reduction in the common ER charging zone is substantial and a big achievement for ANA.

PI 30: The TNC DC are not subject to EU wide targets yet; nevertheless, ANA will make every effort to further reduce costs of its terminal ANS.

The results of the monitoring exercise 2016 show, that the actual 2016 TNC costs were also substantially lower than the DC for the same year (-2,3%) despite a further increase in traffic and traffic service units.

PI 31: The determination of all financial data items and traffic service units for 2016 was successful and the monitoring exercise for 2016 charges for TNC was successfully closed.

The mechanism for the calculation and carry forward adjustment for traffic and modulation effects adopted is transparent and correct, of benefit to users, to ANA's stakeholders and to ANA.

The results as regard **KPI 13** (**CEF for AER costs**) was:

PI 32: In 2016 FIN had proposed a new cost base and financing strategy for ANA AER services. The proposal was not carried by MDDI.

Therefore, the PI and target to reduce costs by 1,5% per annum over 4 years, has no reference framework.

However, given the 2016 budget for AER in ANA could save nearly a third of the budgeted costs (-32%). This is a very good result.

Finally, the results in **KPI 14** (**Increase productivity of FIN** in the three PIs are as follows:

PI 33: The number of unpaid bills, where the payment term has lapsed, was reduced to 61.

PI 34: Also in this PI FIN could achieve a good result by reducing the number of reminders to 70 and finally

PI 35: No more complaints were received from customers regarding the bills issued by ANA.

With these results FIN has achieved good results in 2016.

Tab. 21 (next page) summarises the FIN KPI / PI results.

[51] It should be mentioned here that ANA joined the ER cost recovery scheme only in RP2; nevertheless, BE LUX were not allowed to revise the 2014 start values.

Table 21 – FIN KPI / PI results 2014 - 2016

FIN Dept - KPI 12 - 15 - Cost reduction ER & TNC / Aerodrome (SUB) & Productivity increase Achievements 2014 - 2016					
KPI 12	**Cost-Efficiency (CEF) of en route and terminal air navigation services**	**2014**	**2015**	**2016**	**Annual targets**
PI 29	DC of En Route services (ER)	NA	not achieved	minus 2,5%	-3,30%
PI 30	DC of terminal services (TNC)	NA	plus 5%	minus 2,3%	-2,10%
PI 31	Terminal cost-recovery monitoring	NA	Done	Done	All data correct
KPI 13	**Cost-Efficiency (CEF) aerodrome costs**				
PI 32	Aerodrome costs	NA	Financing decision pending	minus 32%	-1,5% / year (no reference)
KPI 14	**Productivity increase**				
PI 33	Number of outstanding receivables (bills)	72	65	61 (6% of all bills)	minus 10%
PI 34	Number of recalls of suppliers / number of bills	182 (6,5% of all bills)	72 (2,5% of all bills)	70 (2,5% of all bills)	< 3,5%
PI 35	Number of customer complaints related to billing	0	0	0	0

ANA financial situation 2016

The following Tabs. 22 and 23 give the financial situation of ANA for the calendar year 2016 (and for the previous year for comparison) as from the externally audited Annual Account 2016.

Balance sheet after appropriation

Table 22 – ANA Financial Balance sheet 2016 compared to 2015 situation (Status 31.12.2016)[52]

BALANCE SHEET AT 31 DECEMBRE 2016	31/12/2016	31/12/2015
	EUR	EUR
ASSETS		
C. Fixed assets		
I. **Intangible assets**		
2 Concessions, patents, licences, trade marks		
and similar rights and assets if they were		
a) acquired for valuable consideration and need not be shown under C I-3	46 277,33	57 871,03
	46 277,33	**57 871,03**
II. **Tangible assets**		
2 Loans to affiliated undertakings	6 990,49	11 314,55
3 Participating interests	324 049,84	426 754,86
	331 040,33	**438 069,41**
III. **Financial assets**		
6 Other loans	0,00	50,00
	0,00	**50,00**
Total (Fixed assets)	**377 317,66**	**495 990,44**
D. Current assets		
I. Stocks		
1 Raw materials and consumables	297 074,66	396 831,70
	297 074,66	**396 831,70**
II. Debtors		
1 Trade debtors		
a) becoming due and payable after less than one year	1 884 571,28	1 612 941,37
4 Other debtors		
a) becoming due and payable after less than one year	1 113 872,16	1 113 869,16
	2 998 443,44	**2 726 810,53**
IV. Cash at bank and in hand		
	12 999 685,02	**12 854 201,98**
Total (Current assets)	**16 295 203,12**	**15 977 844,21**
E. Prepayments and accrued income	**57 266,90**	**126 428,59**
TOTAL (ASSETS)	**16 729 787,68**	**16 600 263,24**

[52] Explanatory notes from the Annual Account Report 2015 have been omitted. The details are provided in the document: ANA (2017), *Comptes Annuels au 31 décembre 2016*.

Table 22 (cont´d)

BALANCE SHEET AT 31 DECEMBRE 2016	31/12/2016	31/12/2015
	EUR	EUR
LIABILITIES		
A. Capital and reserves		
I. Subscribed capital	5 550 087,48	5 550 087,48
V. Profit or loss brought forward	10 251 443,30	11 126 864,44
VI. Result for the financial year	181 310,01	-875 421,14
Total (Capital and reserves)	15 982 840,79	15 801 530,78
B. Provisions		
3 Other provisions	52 484,74	271 988,39
Total (Provisions)	52 484,74	271 988,39
C. Creditors		
4 Trade creditors		
a) becoming due and payable after less than one year	520 505,84	399 054,34
8 Other creditors		
a) Tax authorities	173 511,71	127 689,73
c) Other creditors		
i.) becoming due and payable within one year	444,60	0,00
Total (Creditors)	694 462,15	526 744,07
TOTAL (CAPITAL, RESERVES AND LIABILITIES)	16 729 787,68	16 600 263,24

Profit and loss account

Tab. 23 below gives the final profit and loss sheet for the year 2016 (January to December) approved by external financial audit.

Table 23 - ANA Financial results (Profit / Loss) 1.1.2016 – 31.12.2016 (and 2015 situation)

PROFIT AND LOSS ACCOUNT FOR		2016	2015
THE YEAR ENDING 31 DECEMBER 2016		**EUR**	**EUR**
1.	Net turnover	17 536 461,62	15 818 686,70
4.	Other operating income	281 609,84	137 614,40
5.	Raw materials and consumables and other external expenses		
a)	Raw materials and consumables	-136 445,92	-355 394,29
b)	Other external charges	-4 014 550,92	-3 518 149,82
6.	Staff costs		
a)	Wages and salaries	-12 439 202,57	-11 675 950,81
b)	Social security costs		
i)	relating to pensions	-114 621,41	-82 564,25
ii)	other social security costs	-599 414,13	-577 004,30
c)	Other staff costs	-5 921,48	-8 281,01
7.	Value adjustments		
a)	in respect of formation expenses and of tangible and intangible fixed assets	-124 724,04	-141 903,81
b)	in respect of current assets	-143 189,10	177 242,77
8.	Other operating expenses	-58 691,88	-650 013,28
11.	Other interest receivable and similar income		
b)	other interest and similar income	0,00	452,01
14.	Interest payable and similar charges		
b)	other interest and similar charges	0,00	-155,45
16.	Profit or loss after taxation	181 310,01	-875 421,14
18.	**Profit or loss for the financial year**	**181 310,01**	**-875 421,14**

USER & STAKEHOLDER CONSULTATION 2016

This chapter describes the user and stakeholder related activities and formal user consultation process in 2016.

Consultation of users in 2016

One consultation and information meeting was held in October 2016 with the Airport User Committee (AUC), representatives from airlines operating on Luxembourg airport, lux-Airport and ANA as the aerodrome operators, the regulator for the airport (*Institut Luxembourgeois de Régulation*, ILR[53]), DAC and the MDDI.

- **ANS**: main items were the Terminal Charges (TNC) and modulation, the annual report and annual plan presentation in the frame of the EU regulation for ANS.
- **AER**: main items were the aerodrome (infrastructure and refurbishment) work planned and the ongoing certification work.

ANS consultation

User charges: The TNC formula developed, simulated and applied is adjusted every year in accordance with the performance plan and the calculated unit rate.

ANA reported the outturn of actual costs for ER and TNC in May 2016 to DAC and MDDI.

The details of the method applied to calculate the traffic and modulation effect in TNC and the unit rate to be applied in 2018 for terminal services are also already known to DAC and MDDI.

The outturn and proposed revision of the actual TNC will be one main item in the 2017 AUC meeting. The new TNC rate will by then be formally agreed also by users.

ER charges are subject to consultation at regional level with Belgium, MUAC and Luxembourg.

ANA Strategy: During the user consultation meeting users are also informed about ANA's Business Plan.

AER user consultation

ANA, during 2016 still in its capacity as the assumed Aerodrome Operator informed users about the certification work. This work is described in Part 2 of this report.

One part of the official and formal user consultation is directed to aerodrome developments, the planning of infrastructure works and consulting users about best possible ways to arrange these works in a way that limits if not avoids operational impacts.

ANA reported the improved performance and practically uninterrupted operation before, during or after RWY works and on the performance of removing RWY contamination (e.g. snow, ice, other).

DAC – ANA mutual consultation

The exchange of information and consultation between DAC and ANA on safety regulatory and safety management matters takes place in the format of regular meetings (ADIM) between DAC and ANA.

The aim of these meetings is to create a common understanding of subject matter issues to save efforts and time and facilitate the preparation of documentation and audits.

These meetings continued throughout the entire reporting period and have proven to be effective and efficient and to mutual benefit.

Other Stakeholder consultation

ANA maintained a close coordination with other stakeholders at State level (MDDI and other Ministries), with lux-Airport, the surrounding communities and other institutions that have a vested interest in the ongoing developments and in the various services of ANA.

The consultation was intense during the period of the SYNergie project reporting and decision making.

State authorities are also closely consulted and informed about the upcoming SES issues and on the financial issues in the FPP monitoring, the technical issues related to charging and financing.

[53] ILR is the national regulatory body and was identified as the appropriate Independent Supervisory Authority (ISA) for Luxembourg Airport and granted ISA powers by the Law of 23 May 2012 implementing EU Directive 2009/12/EC on airport charges.

HUMAN RESOURCES POLICY

This chapter describes the human resources situation and policy of ANA during the reporting period.

Human resources situation

The HR-Legal department is responsible for the coordination of personnel demand, recruitment, initial and the administrative part of the continuous general and specific job related training together with the State (ministerial) authorities involved and in close cooperation with the staff demanding units.

Many improvements have been achieved and we will further continue to focus on:

- Respecting alignment of the processes and procedures at State level.
- Recruitment of sufficient competent staff in line with the specific competence requirements and needs of ANA technical, operational, managerial and other service areas.
- Developing ANA agents' skills and competences

For some very specific posts ANA used to face problems to recruit the right caliber of staff. This situation has slightly improved in 2017.

Certified ANA Services

Description of the manpower situation in certified services in June 2017:

- **AIS**: 12 staff worked in the AIS department including the head of department and the deputy head of department plus 1 contractor.
- **ATC**: 45 ATC controllers both APP and TWR (officials), 2 contractors and 1 department head worked for this department.
- **CNS** under the ATC department: 14 staff are responsible for ANA's technical equipment including 1 CNS Manager, 1 stock officer and a MET team of 5 agents which is allocated to the MET department.
- **MET**: 19 staff worked for the MET department including the head of department.

All students have undergone initial training during the last reporting period.

(See also chapters on ATC, MET, AIS, and CNS in this report for details on competence and training of respective unit staff.)

Enablers and Support Services

Enablers for service provision are the following fucntions / posts:

- Deputy Director;
- Purchasing: 1 staff;
- *Comptable Public*: 0.5 FTE staff;
- Communication and External Relations: 1 staff;
- The Finance department is composed of 5 staff including a Finance Manager.
- The administrative departement is composed of 2 units (*Accueil* / Secretariat / Statistics and *Entretien* / *Bâtiment*), in 2017 a total of 8 FTE staff.
- The IT service is composed of 4.75 agents including one IT Manager.

  Travaux Généraux: 4 staff.

- HR-Legal

The HR-Legal department has 5 staff and 1 HR Manager.

The structure of the function is as follows:

- Legal Affairs;
- Training and Competences;
- HR administration.

- Certification

This function consists of:

- Emergency Planning;;
- Programs (PMO);
- Quality, Risk and Compliance;
- Safety ANS;
- Safety AER;
- Security;
- Strategy & Performance.

A total of 8 FTE staff (in 2017), including the safety manager and 3 contractors worked in the safety department. Each operational department provides a safety officer and a deputy safety officer assigned to this task as part of their normal responsibilities from within the departments who collaborate closely with the safety department.

One program manager supervises the management and the purchasing of the different projects and is supported by an assistant and the Purchasing Process Coordinator. Project leaders and task leaders are assigned to projects from the respective departments involved in the projects on a part-time basis.

Aerodrome services

- **Fire brigade (SIS)**: 50 fire fighters out of which 7 are "stagiaires", worked in the SIS department including the head of department, the deputy head of department and a technical support agent.
  The integration to CGDIS is foreseen in 2018.
- **Electrotechnical Services (ELE)**: 7.5 FTE electricians worked in this department.
- **Operations**: 4.5 FTE people worked in that department.
- **Infrastructure**: 2 people worked in that department.

Impacts from Strategic Initiatives

The strategic initiative SYNergy project launched in 2014 and finalised in 2016 with MDDI decisions of course affects the human resources requirements in terms of creating new or changes to existing functions and in competence and skills. The impact assessment is ongoing. However, many items are still pending final decisions.

One of the aims of the initiative was and still is to use and build the competence of staff to cope with the changes and prepare to cover the new missions related to the changes in the roles and functions.

The new Business Plan[54] captures and sets the new framework in which Human Resources of ANA will play an important role.

Human resources policy

This sub-chapter describes the way in which ANA sets its policy and how it manages to justify, recruit and finally acquire its human resources in accordance with operational, safety, technical and other demands. These conditions have not changed during 2016 -2017.

ANA acknowledges the contribution of its personnel to a safe, efficient, continuous and sustainable service in air navigation and aerodrome services. The core task of the HR function in ANA is to ensure that ANA recruits staff of the right calibre and maintains and develops the skills of its personnel at all levels as required by the services and in alignment with ANA's strategy. The structure, processes and procedures set up in HR as well as the policies that drive the work of HR have been designed in such a way to support ANA in the achievement of its strategic goals.

ANA's duties and responsibilities are constantly increasing, leading to a growing need in staff numbers and changes in staff competence. The exact recruitment and training / competence needs are identified, defined and justified inside ANA.

ANA hires staff either as civil servants (public officials), employees (agents) or workers. Occasionally it also contracts consultants who assist with specific projects, provide specific competences or to overcome immediate staff shortages.

The following paragraph describes the hiring procedure, which is different for each staff group. ANA requires the approval of the Ministry of Sustainable Development and Infrastructure (MDDI) before recruiting.

For civil servants, employees and workers it also needs the approval of the Government Council for some specific cases and of the *"Commission d'économies et de rationalisation (CER)".*

Civil servants

The hiring procedures for officials have not changed during 2016-2017.

When ANA has received the approval of the responsible authorities, it asks the *"Ministère de la Fonction Publique et de la Réforme Administrative*" to announce the job vacancies. The candidates who match the specific jobs on offer are invited for various interviews and selection tests according to ANA HR Recruitment Process.

For ATC, MET, AIS, CNS and SIS, successful candidates are sent on specialized education that take from 6 to up to 30 months, depending on the type of education. Typically, these specialized courses are delivered only in other countries (commonly France and Germany).

Candidates follow a 2 to 12 weeks initial training in a governmental institute in Luxembourg accompanied by On-the-Job training.

At the end of the "*période de stage*", the candidates have to pass a second exam in order to be definitely appointed.

Employees and workers

If ANA has received the approval of the responsible authorities, it asks the *"Ministère de la Fonction Publique et de la Réforme Administrative"* to publish the job vacancies.

All candidates send in their application via that Ministry and ANA then chooses from the complete list of suitable candidates. Successful candidates are invited for various interviews and selection tests according to ANA HR Recruitment Process.

For ATC, MET, AIS, CNS and SIS, successful candidates are sent on specialized education that take from 6 to up to 30 months, depending on the type of education. Typically, these specialized

[54] ANA (2017), ANA – 5 Year Business Plan 2017 – 2021. (Released). ANA: Luxembourg

courses are delivered only in other countries (commonly France and Germany).

Candidates follow a 4 weeks initial training in a governmental institute in Luxembourg accompanied by On-the-Job training.

At the end of the “période de stage”, the candidates have to pass a second exam in order to be definitely appointed.

Consultants

If ANA detects a need for additional assistance in a specific domain, and for a limited period of time it has to foresee the approximate amount in its budget proposition for the following year.

During the following year, ANA can propose a candidate to the Ministry of Sustainable Development and Infrastructure. After receipt of written approval from the Minister, the director of ANA signs the contract with the consultant.

KPI 16 – HR achievements in 2016

In 2016 HR-Legal joined the KPI / PI management scheme with its first KPI version, which was released in July 2016 and included in the Annual Plan 2016 – 2017.

The achievements in terms of HR policies and framework development already in this first year are manifold and detailed. The data and information provided on recruitment and training, on efforts spent in both core areas etc. provide a lucid picture on the issues in question.

Tab. 24 gives a summary only; some details as per PI / action are added in the following paragraphs:

PI 36 – Adequacy of HR structure with ANA’s HR requirements vs.

PI 37 – Adequacy of HR policies with ANA service requirements:

HR defined the overall HR policy (see before) and the five key functions of HR (Action 1):

- Recruitment;
- Training and competence;
- Career development;
- Time management;
- HR budget (for training, overtime payments etc).

For each function measures for success were defined and used in the KPI / PI reports.

As one example: the number of training days spent per staff in each department, the extent of training needs identified and trainings actually performed and planned vs. spent training costs.

These results are worthwhile inputs to a better planning and execution of training activities and setting priorities (similar for overtime payments and financing).

The follow up and action plan with regard to the results is ongoing.

The aim of these exercises is to **better align the policies and structures** with service and competence requirements.

The changed policies and new procedures are stored and published (in the Consense toolbox) internally in ANA and communicated to all staff.

Table 24 – KPI 16 – achievements by HR in ANA

HR Dept - KPI 16 - Adequacy of human resources functions and policies - Achievement 2016			
KPI 16		**2016**	**Targets**
PI 36	**Adequacy of HR structure with ANA service requirements**	HR policy defined	REDEFINE ANA HR ORGANISATIONAL STRUCTURE
Action 1	Identify the key functions in HR that have a direct impact on the availability of human resources	5 key functions defined	Achieved
Action 2	Define the key functions in terms of outcome that they shall deliver and the impact of the functions in terms of (a) costs involved, (b) risk of turnover, (c) training	PI´s identified for all 5 functions	Achieved
PI 37	**Adequacy of HR policies with ANA service requirements**		
Action 3	Audit and correct all existing HR procedures	Ongoing	Report # of all policies
Action 4	Implement and communicate new HR policies and procedures	Ongoing	Publish policies once available
	Common PIs		
PI 1	Maintain competence of HR staff	Ongoing	TBD
PI 2	Maintain regular consultation and exchange with ANA internal customers / stakeholders	Done	Hold 1 meeting with all ANS / AER Dep
PI 3	Maintain regular consultation and exchange with ANA external customers / stakeholders	Done	Hold 1 meeting with each external stakeholder (MDDI, ANA departments, State administrations)

ANNEX 1 – ABBREVIATIONS

a/c	Aircraft
ADD	Aerodrome Data Display
ADM	ANA Administrative Department
ADQ	Aeronautical Data Quality
AER	ANA Aerodrome Department
AFTN	Aeronautical Fixed Telecommunication Network (legacy system)
AGL	Airfield Ground Lighting
AIS	Aeronautical Information Service
ALCMS	Airport Lighting Control and Management System
AMC	Accepted Means of Compliance
AMHS	ATS Message Handling System
AP	Annual Plan
ANS	Air Navigation Service
ANSP	Air Navigation Service Provider
AOP	Airport Operator
APP	Approach Control Service
AR	Annual Report
AROC	Airline Representatives and Operators Committee (Luxembourg)
ARTAS	ATM Surveillance Tracker and Server
A-SMGCS	Advanced Surface Movement Guidance and Control System (ground radar)
ATC	Air Traffic Control
ATFM	Air Traffic Flow Management
ATIS	Automatic Terminal Information System
ATM	Air Traffic Management
ATM MP	ATM Master Plan (SESAR)
ATM – SE	ATM specific (technical) event (occurrence)
AWOS	Automatic Weather Observation System
BE-LUX PP	Belgium – Luxembourg Performance Plan (En route)
BOB	Budget System in use in ANA
BP	Business Plan
CAP	Capacity (KPA)
CBA	Cost Benefit Analysis
CAP	Corrective Action Plan
CAPEX	Capital Expenditure
CDO	Continuous Descent Operation
CEF	Cost-Efficiency (KPA)
CER	Commission d'Economies et de Rationalisation
CfT	Call for Tender
CGDIS	Corps Grand-Ducal d´Incendie et de Secours
CNS	Communication, Surveillance and Communication Dept
COM	Communication
CRCO	Central Route Charges Office, Eurocontrol
DAC	Direction de l´Aviation Civile
DFS	Deutsche Flugsicherung
DoV	Document of Verification
DME	Distance Measuring Equipment
DVOR	Doppler VHF Omni-directional Ranging
EASA	European Agency for the Safety of Aviation
EC	European Commission
ENV	Environment (KPA)

eTOD	electronic Terrain and Obstacle Data
EU	European Union
ECMWF	European Center for Medium-Range Weather Forecasts
ELE	ANA Electro technical Service Department
ELLX	ICAO code for Luxembourg airport
ENV	KPI - Environment
EoSMS	Effectiveness of Safety Management System (Questionnaire)
ER	En Route
ESSIP	European Single Sky ImPlementation (Plan; Eurocontrol)
FABEC	Functional Airspace Block Europe Central (BE, CH, DE, FR, LU, NL + MUAC)
FAT	Factory Acceptance Test
FDPS	Flight Data Processing System
FHA	Functional Hazard Analysis
FMTP	Flight Message Transfer Protocol
FOD	Foreign Object Debris
FPP	FABEC Performance Plan
FTE	Full Time Equivalent
GP	Glide Path
IAIP	Integrated Aeronautical Information Publication
ICAO	International Civil Aviation Organisation
IGF	Inspection Général des Finances
ILR	Institut Luxembourgois de Régulation
IMS	Integrated Management System (ANA)
IOP	Interoperability
IR	(EC) Implementing Regulation
ISO	International Standards Organisation
KPI	Key Performance Indicator
L-AST	Local Aerodrome Safety Team
LOC	Localiser
LSSIP	Local Single Sky ImPlementation (State ANSP and Regulator/ NSA Plan)
LVP	Low Visibility Procedure
MDDI	Ministre du développement durable et des infrastructures
MET	Meteorological service
MoU	Memorandum of Understanding
MUAC	Maastricht Upper Area Control (Eurocontrol)
NA	Not Applicable
NAV	Navigation
NDB	Non Directional Beacon (a navigation aid)
NM	Network Manager (Eurocontrol)
NOTAM	Notice to Airmen
NSA	National Supervisory Authority
OPS	Operations
PANS	Procedures for Air Navigation Service
PCH	Administration Ponts et Chaussees Luxembourg
PI	Performance Indicator (local/ national)
PIA	Plan d´Intervention Aeroportuaire
PIB	Pre-flight Information Bulletin
PIU	Plan d´Intervention d´Urgence
PMG	Performance Management Group (FABEC)
PMO	ANA Programme Management Office
PPP	Portfolio-Program-Project structure
PTO	Procèdures Technique et Opèrationelles

QM	Quality Management
QMS	Quality Management System
RAT	Risk Assessment Tool
RI	Runway Incursion
RDP	Radar Data Processor
RMCDE	SuRveillance Message Conversion and Distribution Equipment
RP	(SES Performance Scheme) Reference Period (RP1 = 2012 - 2014; RP2 = 2015 - 2019)
RWY	Runway
SAF	Safety (KPA)
SDDS	Surveillance Data Distribution System
SES	Single European Sky (EC)
SIG	Système d´Information Géographique
SIS	ANA Fire brigade and rescue service (Service Incendie et Sauvetage)
SLA	Service Level Agreement
SLoA	(ESSIP/LSSIP) Stakeholder Line of Actions
SMI	Separation Minima Infringement
SMR	Surface Movement Radar
SMS	Safety Management System
SMT	Strategic Management Team (ANA)
SMU	ANA Safety Management Unit
SNOWTAM	special series NOTAM indicating snow or slush conditions on airports
SPI	Surveillance Performance and Interoperability
SSAS	Software Safety Assurance System
SUR	Surveillance
SURNET	Surveillance Network
TAF	Terminal Aerodrome Forecast (MET)
TAR	Terminal Radar
TIL	Technical Intervention Tool (ELE)
TMA	Terminal Control Area
TNC	Terminal Costs
TOD	Terrain and Obstacle Data
ToR	Terms of Reference
TOT	Taxi Out Time
TWR	Tower Service
TWY	Taxiway
UPS	Un-interruptible Power Supply
VoIP	Voice over Internet Protocol
WMO	World Meteorological Organisation
WP	Work Package

ANNEX 2 – ANA ANSP SAFETY PLAN 2016 – 2017 – STATUS OF ACHIEVEMENTS

FOCUS AREA 1: UNION-WIDE PERFORMANCE TARGETS FOR SAFETY KEY PERFORMANCE AREAS

REF. #	OBJECTIVES	ACTION ITEMS	2016	2017	Owner	Status July 2017
1.1	Effectiveness of safety management					
1.1.3	Safety standards and procedures	Verify that all primary systems have redundant capabilities	Q2		ANA/SMU	Provide update: i.e. new deadline or Done / Continuing activity
		Develop and document emergency/contingency procedures	Q3		ANA/SMU	Done
		Distribute procedures to all appropriate staff	Q3		ANA/SMU	Done
		Coordinate emergency/contingency plans with all interfaces	Q3		ANA/SMU	Done
		Review / update safety standards and procedures on a regular basis	Q4		IMS	Done
1.1.3	Adoption and sharing of best practices	Establish a structure to identify safety best practices	In place / Continuing activity		SMU	In place / Continuing activity
		Share best practices with industry stakeholders as required by regulation	Continuing activity		SMU	Continuing activity
		Local Airside Safety Team has been re-launched, but is now under lux-Airport responsibility	In place / Continuing activity		Lux-Airport	In place / Continuing activity
		Participate to IntACT audits within other FABEC ANSPs	Continuing activity		SMU	Continuing activity
		Attend industry workshops on safety and SMS best practices	Continuing activity		SMU	Continuing activity
		Systematically share safety lessons across the organisation	Continuing activity		SMU	Continuing activity
		Publish a policy to encourage proactive sharing of safety practices and lessons	In place / Continuing activity			In place / Continuing activity
		Make safety performance info available to public (info not governed by applicable requ.)	Continuing activity			Continuing activity
1.1.3	Integrated safety planning process	Publish organization safety plan on periodic basis	Continuing activity		SMU	Continuing activity
		Include goals, targets and responsibilities in safety plan	Q3		ANA/SMU	Continuing activity
1.1.3	Safety-related interfaces	Develop, coordinate and manage safety-related interfaces	Continuing activity		ANA/SMU	Continuing activity
		Document interfaces through contractual agreements	Continuing activity		ANA/SMU	Continuing activity
		Review / update these agreements on a regular basis	Continuing activity		IMS	Continuing activity
1.1.3	Competency	Set up a process for feedback on training effectiveness	In place / Continuing activity		TRU	In place / Continuing activity
1.1.3	Safety reporting, invest. & improvement	Systematically share lessons learned across the organisation	Continuing activity		SMU	Continuing activity
		Publish a clear policy to encourage proactive reporting	Completed		ANA/SMU	Completed
1.1.3	Safety performance monitoring	Make safety performance info available to public (info not governed by applicable requirements)	Continuing activity		ANA/SMU	Continuing activity
1.2	Risk Assessment Tool (RAT)	Apply RAT to all SMI's and RI's (regardless whether ANA has a contribution or not)	Continuing activity		ATC S.O.	Continuing activity
		Apply RAT to 100% of ATM-Specific Events	Continuing activity		CNS S.O.	Continuing activity
1.3	Just culture implementation	Develop a Just Culture policy	Completed		SMU	Continuing activity
		Document that no impact on pay of the staff member until end of investigation	Completed		ANA	Completed
		Include just culture principles in all training curricula (ab-initio and recurrent)	Continuing activity		TRU	Completed

		Define qualifications and training requirements for safety investigators	Completed		TRU	Continuing activity
REF. #	**OBJECTIVES**	**ACTION ITEMS**	**2016**	**2017**	**Owner**	**Status July 2017**
		Provide legal support for to staff in case of prosecution / legal action		In place	ANA	In place
		Procedure enabling staff concerned to comment investigation findings		In place	SMU	In place
		Involve experts in decision "honest mistake" vs. "unacceptable behavior"		In place	ANA	In place
FOCUS AREA 2: EU SAFETY KEY PERFORMANCE INDICATORS (SMIs, RIs, AIs and ATM SEs)						
REF. #	**OBJECTIVES**	**ACTION ITEMS**	**2016**	**2017**	**Owner**	**Status July 2017**
2.1	**SMI's with ANA contribution**	Monitor number of incidents, severity and trends on a monthly basis		Continuing activity	SMU	Continuing activity
		Present lessons learned during ATC APP safety meetings		Continuing activity	SMU	Continuing activity
2.2	**Runway incursions with ANA contribution**	Monitor number of incidents, severity and trends on a monthly basis		Continuing activity	SMU	Continuing activity
		Present lessons learned during ATC TWR safety meetings		Continuing activity	SMU	Continuing activity
2.3	**Airspace infringements**	Monitor number of incidents, severity and trends on a monthly basis		Continuing activity	SMU	Continuing activity
		Present lessons learned during ATC safety meetings		Continuing activity	SMU	Continuing activity
2.4	**ATM Technical Specific Events (ATM-SE)**	Monitor number of incidents, severity and trends on a monthly basis		Continuing activity	SMU	Continuing activity
		Present lessons learned during safety meetings		Continuing activity	SMU	Continuing activity
FOCUS AREA 3: ANA INTERNAL SAFETY KEY PERFORMANCE INDICATORS						
REF. #	**OBJECTIVES**	**ACTION ITEMS**	**2016**	**2017**	**Owner**	**Status July 2017**
3.1	**ATM incidents with ANA contribution**	Monitor number of incidents , severity and trends on a monthly basis		Continuing activity	SMU	Continuing activity
		Present lessons learned during safety meetings		Continuing activity	SMU	Continuing activity
3.2	**CNS-MET incidents with ANA contribution**	Redefine CNS-MET direct contribution incidents KPIs (according to RAT)		Q4	SMU	Continuing activity
		Monitor number of incidents, severity and trends on a monthly basis		Continuing activity	SMU	Continuing activity
		Present lessons learned during safety meetings		Continuing activity	SMU	Continuing activity
3.3	**ELE incidents with ANA contribution**	Monitor number of incidents, severity and trends on a monthly basis		Continuing activity	SMU	Continuing activity
		Present lessons learned during safety meetings		Continuing activity	SMU	Continuing activity
3.4	**Availability of CNS/MET safety equipment**	Monitor monthly the availability of the CNS/MET, severity and trends		Continuing activity	SMU	Continuing activity
		Identify root cause when availability figure is not met provide remedial actions		Continuing activity	SMU	Continuing activity

FOCUS AREA 4: AUDITS / SURVEYS / RECOMMENDATIONS						
REF. #	**OBJECTIVES**	**ACTION ITEMS**	**2016**	**2017**	**Owner**	**Status July 2017**
4.1	**NSA audit : (2012)**	Implement audit corrective action plan	Completed		SMU	Completed
4.2	**- NC : Software safety assurance system**	Apply SSAS process to ALCMS, AMHS, NDB, DIK-DVOR Apply SSAS to LE/WDU NDB, FDP, AWOS/ATIS, A-SMGCS, IOP G.	Completed	--	SMU	Completed
		RVR, SDDS		Q4	CNS	Continuing activity
4.3	**- NC : Stakeholders**	Further develop SLA's with external and internal stakeholders	Continuing activity		ANA/SMU	Continuing activity
4.4	**- OBS : Risk assessment & mit. for change**	Conduct risk assessments until post implementation of changes	Completed		ANA/SMU	Completed
4.5	**- OBS : Occurr. reporting improvement**	Implement proactive voluntary reporting	Completed		SMU	Completed
4.6	**- OBS : Procedures in Saf. Mgmt Manual**	Safety Management Manual to be completed / finalized	Completed		SMU	Completed
4.7	**- OBS : Scope of the SMS**	Define scope of SMS and add into Safety Management Manual	Completed		SMU	Completed
4.8	**- OBS : External Services and Supplies**	Define procedure to address safety requirements to be fulfilled by subcontracted personnel	Completed		SMU	Completed
4.9	**NSA audit : minor changes (2013)**	Implement audit corrective action plan	Completed		SMU	Completed
4.10	**- NC : Change methodology not followed**	Revise change management procedure	Completed		SMU	Completed
4.11	**- NC : Admin. procedures inconsistency**	Revise change management procedure	Completed		SMU	Completed
4.12	**- NC : Use of different methodology**	Revise change management procedure	Completed		SMU	Completed
4.13	**- OBS : Safety assessment terminology**	Revise change management procedure	Completed		SMU	Completed
4.14	**- OBS : Criteria to define type of change**	Revise change management procedure	Completed		SMU	Completed
4.15	**EASA audit : UNC's**	Implement audit corrective action plan	Completed		SMU	Completed
4.16	**IntACT audits**	Participate in audits at other ANSP's	Continuing activity	Continuing activity	SMU	Continuing activity
4.17	**ISO certification audit**	(No safety-related findings during last audit in May 2016)	Completed	Completed	IMS	Continuing activity
4.18	**Eurocontrol safety culture survey**	Implement corrective action plan	Implemented as far as practicable	Implemented as far as practicable	SMU	Continuing activity
4.19	**AET recommendations**	Follow up recommendations		Q4	SMU	Continuing activity
4.20	**Internal audits and surveys**	Implement remedial actions	Continuing activity		ANA/SMU	Continuing activity

FOCUS AREA 5: EXECUTION OF RECURRENT SAFETY ACTIVITIES AS PER EU REGULATION 1035/2011 AND ACCORDING TO EC 482/2008						
REF. #	**OBJECTIVES / AREAS FOR IMPROVEMENT**	**ACTION ITEMS**	**2016**	**2017**	**Owner**	**Status July 2017**
5.1	**Staff competency**	Verify that personnel is adequately trained, competent, licensed (if applicable)	Continuing activity		TRU	Continuing activity
5.2	**External Services and Supplies**	Review adequate justification of the safety of externally provided services	Continuing activity		ANA Depts	Continuing activity
		Verify that ext. staff have knowledge and understanding of services supported	Continuing activity		ANA Depts	Continuing activity
5.3	**Risk assessment & mitigation (current ops)**	Perform risk assessment and mitigation of ANA units current operations	Continuing activity		ANA Depts	Continuing activity
5.4	**Safety investigation (ATM and technical)**	Perform safety investigations	Continuing activity		ANA Depts	Continuing activity
5.5	**Remedial actions**	Derive remedial action for all significant ATM and technical occurrences	Continuing activity		ANA Depts	Continuing activity
5.6	**Lessons learned**	Disseminate safety practices and lessons learnt within the organization	Continuing activity		SMU	Continuing activity
5.7	**Safety surveys**	Carry out departmental routine safety surveys	Continuing activity		ANA Depts	Continuing activity
5.8	**Safety monitoring**	Continuously analyze incident number, severity and trends	Continuing activity		SMU	Continuing activity
5.9	**Safety records**	Maintain all safety documentation complete and up-to-date	Continuing activity		SMU	Continuing activity
5.10	**Software safety assurance system (SSAS)**	Apply software safety assurance system	Continuing activity		CNS	Continuing activity
5.11	**Change management**	Safety assessment and mitigation with regard to change	Continuing activity		ANA Depts	Continuing activity

FOCUS AREA 6: FABEC IMPLEMENTATION						
REF. #	**OBJECTIVES / AREAS FOR IMPROVEMENT**	**ACTION ITEMS**	**2016**	**2017**	**Owner**	**Status July 2017**
6.1	**FABEC implementation**	Continue participation in all FABEC safety activities	Continuing activity		ANA/SMU	Continuing activity

FOCUS AREA 7: NATIONAL STATE SAFETY PROGRAM						
REF. #	**OBJECTIVES / AREAS FOR IMPROVEMENT**	**ACTION ITEMS**	**2016**	**2017**	**Owner**	**Status July 2017**
7.1	**National State Safety Plan**	Comply with National (State) Safety Plan (once published)	TBD	TBD	ANA/SMU	TBD

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