EN 2014

NO 03

Special Report

Lessons from the European Commission's development of the second generation Schengen Information System (SIS II)

EUROPEAN COURT OF AUDITORS

EUROPEAN COURT OF AUDITORS
12, rue Alcide De Gasperi
1615 Luxembourg
LUXEMBOURG

Tel. +352 4398-1

E-mail: eca-info@eca.europa.eu
Internet: http://eca.europa.eu

Twitter: @EUAuditorsECA
YouTube: EUAuditorsECA

More information on the European Union is available on the Internet (http://europa.eu).

Luxembourg: Publications Office of the European Union, 2014

ISBN 978-92-9241-934-9
doi:10.2865/8113

Printed in Luxembourg

EN 2014

NO 03

Special Report

Lessons from the European Commission's development of the second generation Schengen Information System (SIS II)

(pursuant to Article 287(4), second subparagraph, TFEU)

Contents

Contents

Glossary

Alert: Information on persons or objects entered into the Schengen Information System by competent national authorities.

Business case: Explains the reasons for the project and examines costs, risks, benefits and alternatives. It is created in the initiating phase of the project and kept up to date during the project as costs, risks, benefits and alternatives change.

Business manager: Acts on behalf of the system owner in setting business objectives and priorities.

Decision log: Contains a summary of decisions taken. It brings visibility and accountability to how and by whom decisions are taken.

Deliverable: A document, hardware, software or other product delivered as agreed.

eu-LISA: European Agency for the operational management of large-scale IT systems in the area of freedom, security and justice.

Executing phase: The stage of a project in which the activities set out in project plans are carried out and project deliverables are produced.

Final project phase: Amendment to the SIS II contract agreed in December 2010 with the main development contractor to finalise the system by March 2013 incorporating new capacity, performance and testing requirements.

Governance: Concerns how decisions are made.

HPS: The main development contractor: a consortium of Hewlett-Packard and Steria.

DG Informatics: The Commission's directorate-general responsible for IT.

Initiating phase: The first phase in a project to define the project objective and create the business case.

Interface control document: Document which describes the interface between the central Schengen Information System and national systems.

ISPMB: The Information Systems Project Management Board. It is chaired by DG Informatics and examines new IT project proposals.

Glossary

Member countries: The 26 countries of the Schengen Area. The UK and Ireland, though not part of the Schengen Area also participate in the Schengen Information System, with the exception of alerts relating to non-Schengen nationals.

Milestone tests: System tests introduced following the Council's request of June 2009 which SIS II had to pass successfully in order to continue with the project.

Planning phase: Second stage of a project in which the various project plans are established.

Schengen Area: An area containing 26 European countries that have abolished passport and immigration controls at their common borders. It consists of 22 EU Member States and the four member countries of the European Free Trade Association (EFTA).

SISVIS Committee: Committee assisting the Commission in developing SIS II and the Visa Information System, composed of all member countries and chaired by the Commission.

Stakeholders: Those who can affect or be affected by the project. The business side includes the system owner, business manager and users. The IT side includes the system supplier, project manager and project team.

Steering committee: Sets out the main orientations and coordinates the project's main tasks. It approves resources allocated to the project and main project deliverables.

System owner: Is responsible for setting the business objectives and priorities and typically chairs the steering committee.

System requirements: Description of the required behaviour of the system to be developed.

System supplier: Supplies the IT system in line with agreed requirements, timing and budget.

Unisys: The quality assurance contractor.

Visa Information System (VIS): Large-scale IT system developed by DG Home Affairs at the same time as SIS II and through the same main development contract.

Executive summary

I

The Schengen Information System (SIS) is used by border guards, police, customs, visa and judicial authorities throughout the Schengen Area. It contains information (alerts) on persons who may have been involved in a serious crime or may not have the right to enter or stay in the EU. It also contains alerts on missing persons and lost or stolen property, such as banknotes, vehicles, firearms and identity documents. Alerts are entered in the system by national authorities (see paragraph 1).

II

Developed and operated in an intergovernmental framework, the initial Schengen Information System (SIS 1) was in operation from 1995 until the launch of SIS II in 2013. In 2001, the Council decided to replace it with the second generation version (SIS II). The Council charged the Commission with its development and DG Home Affairs[1] managed the project with a target launch date at the end of 2006. The main reason initially for developing SIS II was to connect more member countries. In addition, SIS II was to benefit from the latest technological developments and added functions such as new categories of alerts, a facility to link alerts and the capacity to store documents associated with an alert (see paragraphs 2 and 3).

III

The European Court of Auditors examined whether the Commission delivered SIS II on time and in line with initial cost estimates. It also examined whether there was a robust business case for SIS II throughout the project, which took into account major changes to the costs and expected benefits. In addition, the Court assessed whether the Commission had learnt and applied lessons from its management of the project (see paragraphs 4 to 7).

1 At the time, this was DG Justice, Freedom and Security.

IV

The audit found that the Commission delivered the central system, but over 6 years later than initially planned and at 8 times the initial budget estimate. The delay and overspending resulted partly from the challenging governance context which limited the Commission's ability to address operational issues and partly from weaknesses in the Commission's management. This was particularly the case during the first part of the project up until 2009:

(a) The initial project deadline was unrealistic (see paragraphs 9 to 12).

(b) The Commission did not update its 2003 global project budget until 2010 (see paragraphs 34 to 37).

(c) System requirements evolved during the project to meet the needs of users and were not sufficiently stable until the final project phase from 2010. The system now in operation has a much larger capacity than the one foreseen in 2001 (see paragraphs 29 to 32 and 42 to 43).

(d) Until 2007 the Commission did not allocate sufficient staff with the expertise to manage outsourced development work effectively (see paragraphs 13 to 20).

(e) The main development contractor delivered an underperforming system in the first part of the project (see paragraphs 39 to 41).

(f) Working relations between some member countries and the Commission were initially poor. Until the Commission created the Global Project Management Board in 2009, it did not manage to draw on the experience of all end-users (see paragraphs 21 to 25).

(g) It was not clear to all stakeholders who made key decisions (see paragraphs 26 to 28).

(h) The Commission increased the value of the main development contract from 20 million euro to 82 million euro through negotiated amendments. Whilst this procedure is provided for in the Financial Regulation, there is an inherent risk with any negotiated procedure that the prices paid are not competitive (see paragraphs 44 to 49).

V

During the project there were major changes to the costs and expected benefits. The initial indicative estimates of the costs to the EU budget for the central system significantly underestimated the true scale of the investment necessary. The full cost of SIS II amounted to some 500 million euro by the end of the project: 189 million euro for the central system and an estimate of over 330 million euro for national systems. At the same time, the main benefit initially expected of SIS II was less relevant because SIS 1 had been successfully extended to new member countries in 2007 through SISone4all. However, despite these changes to the costs and benefits, the Commission did not thoroughly reassess the business case for the project in order to demonstrate that SIS II remained an organisational priority which provided a higher return on investment than other opportunities (see paragraphs 50 to 63).

VI

The Commission did learn lessons from its experience during the first part of the project, enabling it to change its approach during the final project phase from 2010 and deliver SIS II in April 2013. In addition, although it has not carried out a formal evaluation, it has already applied some lessons from SIS II in preparing other large-scale IT projects (see paragraphs 64 to 69).

VII

On the basis of these observations, the Court's main recommendations are that, when managing the development of large-scale IT systems, the Commission should (see paragraphs 70 to 72):

(a) base the timetable on a technical analysis of the tasks to be performed;

(b) ensure that all projects are integrated into corporate IT governance arrangements and make full use of in-house expertise to manage the work of contractors effectively;

(c) ensure that business needs and the views of end-users are sufficiently taken into account in decision-making;

(d) ensure the approval of the business case before progressing from project initiation to project planning and its reapproval in the event of major changes to project costs, expected benefits, risks or alternatives;

(e) ensure that key project decisions are documented in a decision log so that they are easily traceable;

(f) ensure that there is effective global coordination when a project requires the development of different but dependent systems by different stakeholders;

(g) develop large-scale IT systems using interoperable building blocks which can easily be reused to prevent being locked in to a single contractor;

(h) pass on the lessons learnt from the Court's audit to directorates-general and EU institutions, agencies and other bodies. The Commission should evaluate whether the expected benefits of SIS II were achieved.

Introduction

01

The Schengen Information System is used by border guards, police, customs, visa and judicial authorities throughout the Schengen Area[2]. It contains information (alerts) on persons who may have been involved in a serious crime or may not have the right to enter or stay in the EU. It also contains alerts on missing persons and lost and stolen property, such as banknotes, vehicles, firearms and identity documents. Alerts are entered into the system by national authorities. The initial Schengen Information System (SIS 1) was developed as an intergovernmental project led by France and became operational in 1995. It remained in operation, managed by France, until May 2013, when it was replaced by SIS II. Both SIS 1 and SIS II consist of national systems, developed by member countries, linked to a central system by a network (see ***Figure 1***).

02

The Schengen countries initially took the decision to create a second generation Schengen Information System (SIS II) in December 1996. In December 2001 the Council made the Commission responsible for the development of this system with a target date of the end of 2006. The Commission's DG Home Affairs managed the project and outsourced the development work for the central system.

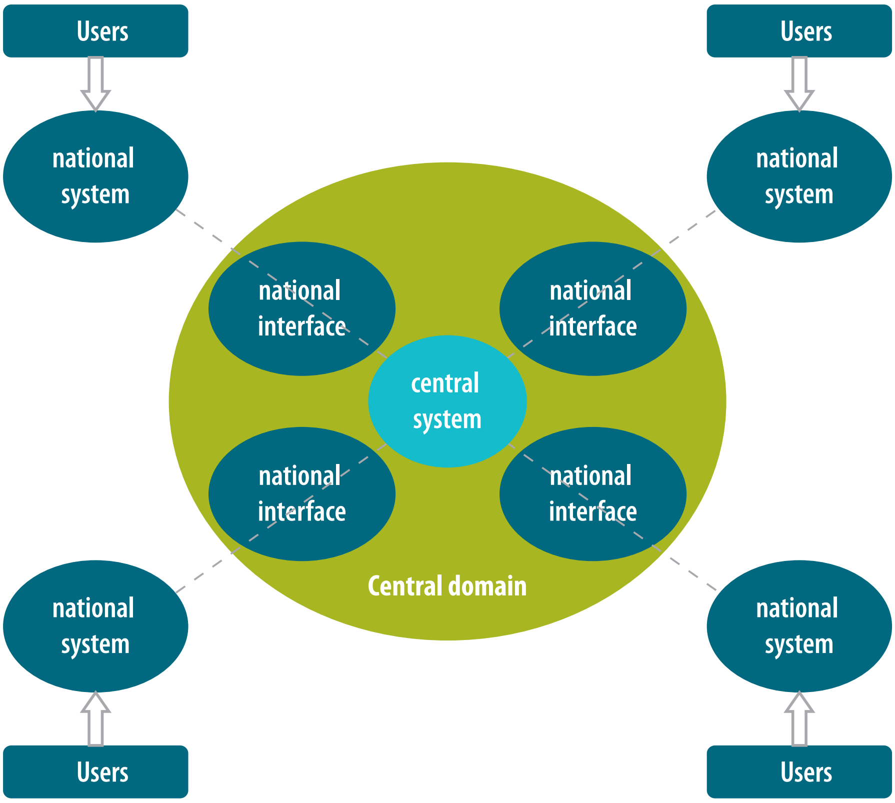
03

The primary reason for developing SIS II was to connect the increased number of member countries after the 2004 enlargement of the European Union. In addition, SIS II was to benefit from the latest technological developments and added functions.

2 The 26 countries of the Schengen Area are Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden and Switzerland.

Figure 1

Overview of the Schengen Information System



Source: European Commission, DG Home Affairs.

Audit scope and approach

Audit scope

04
The audit examined whether the Commission managed the development of SIS II well and addressed the following four questions:

(a) Did the Commission deliver SIS II on time?

(b) Did the Commission deliver SIS II in line with initial cost estimates?

(c) Was there a robust business case for SIS II throughout the project which took into account major changes to the costs and expected benefits?

(d) Did the Commission learn and apply lessons from its management of the SIS II development project?

05
Within the Commission as a whole, there is considerable experience in the development of IT projects and guidance to directorates-general on how to manage IT projects successfully[3]. The Commission also recognises the need to draw lessons from developing specific IT projects and to share these lessons across the organisation[4]. In 2011, for example, the Commission's Internal Audit Service identified lessons from a review of the set-up of IT projects in various Commission directorates-general[5]. The Court's audit of SIS II provided an opportunity to identify, within a single project, the reasons for delays and overspending, and the changes which enabled the Commission finally to deliver the system.

06
This was not an IT audit intended to provide assurance on the quality of SIS II and it did not examine how the national authorities managed the development of their SIS II systems.

3 The Rational Unified Process (RUP@EC) was the standard software development methodology within the Commission set out in the 2004 Communication on the improvement of information technology governance in the Commission, SEC(2004) 1267. In 2011, this was complemented by the Project Management Methodology PM².

4 Getting the best from IT in the Commission, SEC(2010) 1182 final of 7 October 2010.

5 Internal Audit Service management letter of 1.2.2011, Set-up of IT Projects in the Commission.

Audit approach

07

The audit was based on:

(a) structured interviews with SIS II stakeholders. The stakeholders interviewed included:

(i) Commission staff in DG Home Affairs responsible for the development of SIS II;

(ii) Commission staff in DG Budget, DG Informatics, the Secretariat-General and DG Taxation and Customs Union regarding issues relating to IT governance at the Commission and the development of other large-scale IT systems;

(iii) the main SIS II development contractor (a consortium of Hewlett-Packard and Steria) and the quality assurance contractor (Unisys);

(iv) staff from the Secretariat of the EU Council and the European Parliament who followed the development of SIS II;

(v) stakeholder representatives from six member countries (Germany, Spain, France, Luxembourg, Hungary and Portugal). The six member countries were selected in order to provide a broad cross-section of opinions.

(b) A survey of stakeholders involved in the development of SIS II from all member countries, the Secretariat of the EU Council, the Commission and contractors working for the Commission. The survey sought the views of stakeholders on various aspects of the development of SIS II. 91 out of 144 selected stakeholders replied to the survey, representing a response rate of 63 %. Of the respondents, 81 were from member countries and the Council, whilst 10 were from the Commission and its contractors. Three quarters of respondents had been involved in the project since 2009 or earlier.

(c) A review of documentation and procedures relating to SIS II.

Section 1 — The Commission delivered SIS II albeit over 6 years late

Audit criteria

08
The audit examined whether:

(a) there had been a realistic project timetable;

(b) the Commission had allocated sufficient expertise to the project to monitor its execution and supervise contracts effectively;

(c) the Commission had had good working relations with stakeholders and had taken into account the views of end-users;

(d) there had been clear decision-making arrangements;

(e) the requirements of the system had been sufficiently stable to enable the system to be developed efficiently.

The initial project deadline was unrealistic

09
In December 2001, a Council regulation[6] set the initial project deadline as the end of December 2006. This was intended to enable the countries which were to join the EU in 2004 to become part of the Schengen Area at the end of 2006. Although the deadline was considered achievable by the Commission's 2003 feasibility study, this assumed that the requirements would be stable and the specifications developed rapidly[7]. By the end of 2003, the Commission recognised that the initial deadline would be difficult to achieve[8]. However, it was not revised until the end of 2006. In the Court's audit survey of key SIS II stakeholders, most respondents (69 %) considered that the initial deadline was unrealistic. A chronology of the development of SIS II is shown in the ***Annex***.

10
In the audit survey, respondents were asked to weight the reasons for the 75-month delay. Respondents considered that part of the delay was because the initial deadline had not been based on a realistic technical analysis. They gave a weighting of 16 % to this reason (see ***Figure 2***).

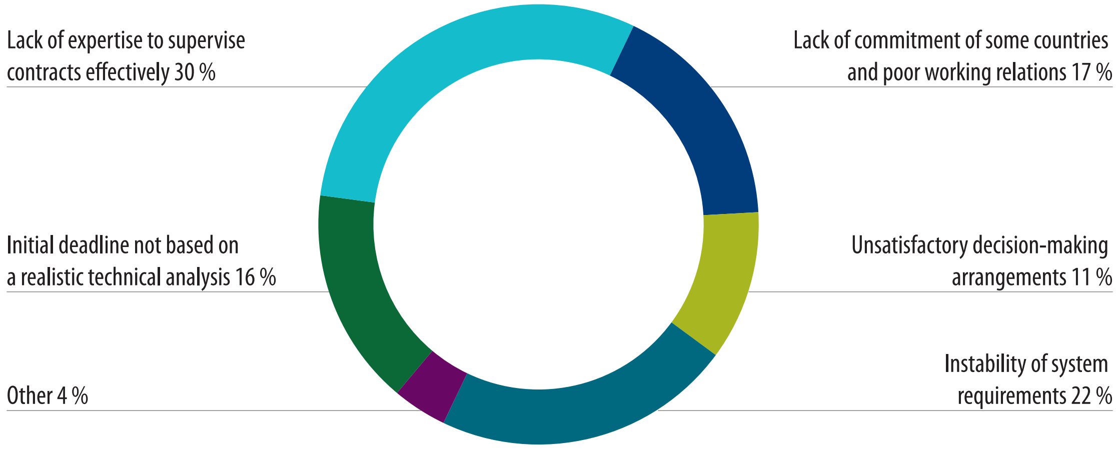
6 Council Regulation (EC) No 2424/2001 of 6 December 2001 on the development of the second generation Schengen Information System (SIS II) (OJ L 328, 13.12.2001, p. 4) and Council Decision 2001/886/JHA of 6 December 2001 on the development of the second generation Schengen Information System (SIS II) (OJ L 328, 13.12.2001, p. 1).

7 Feasibility Study SIS II, Deloitte, 7 April 2003.

8 COM(2003) 771 final of 11 December 2003.

Figure 2

Reasons for the delays in SIS II



Source: Audit survey of SIS II stakeholders.

11

Because the Commission did not deliver SIS II on time, SIS 1 was adapted in December 2007 to connect the new member countries. This modification was a copy of the Portuguese national system and was called SISone4all. It provided a solution for 9 of the 10 accession countries[9], which was the primary objective of SIS II. The following extensions to the initial project deadline were agreed, but were also not met, increasing the risk that the system requirements could change:

(a) In December 2006, the deadline was extended to December 2008[10].

(b) In October 2008, the deadline was extended to June 2010[11].

9 Cyprus was unable to implement the Schengen rules and therefore did not join the Schengen Area.

10 Council Decision 2006/1007/JHA of 21 December 2006 amending Decision 2001/886/JHA on the development of the second generation Schengen Information System (SIS II) (OJ L 411, 30.12.2006, p. 78) and Council Regulation (EC) No 1988/2006 of 21 December 2006 amending Regulation 2424/2001 on the development of the second generation Schengen Information System (SIS II) (OJ L 411, 30.12.2006, p. 1).

11 Council Regulation (EC) No 1104/2008 of 24 October 2008 on migration from the Schengen Information System (SIS 1+) to the second generation Schengen Information System (SIS II) (OJ L 299, 8.11.2008, p. 1) and Council Decision 2008/839/JHA of 24 October 2008 on migration from the Schengen Information System (SIS 1+) to the second generation Schengen Information System (SIS II) (OJ L 299, 8.11.2008, p. 43).

12

In June 2010, the Commission produced a final schedule for the completion of SIS II, which was endorsed by the Council[12]. It met the deadline of March 2013[13] and SIS II was launched in April 2013, over 6 years later than originally planned. After a 1-month period of intensive monitoring, it became fully operational and replaced SIS 1 in May 2013.

Until 2007 the Commission did not allocate sufficient staff with the expertise to manage outsourced development work effectively

13

Survey respondents considered that part of the delay was due to the fact that the Commission lacked sufficient staff with the expertise necessary to supervise contracts effectively. They gave a weighting of 30 % to this reason[14] (see ***Figure 2***).

14

In 2002, the SIS II project team in the Commission consisted of four staff supervised by a Head of Unit[15]. Four additional staff joined in 2003[16]. At the start of the project a representative from DG Informatics participated in some meetings. Only 10 % of respondents considered that, at the start of the project, the Commission had allocated sufficient staff with the necessary skills and experience to deliver SIS II successfully.

15

A 2005 request to senior management[17] for more resources described a situation of permanent crisis management and an inability to respond to issues raised by member countries. Staff on short-term contracts lacked relevant expertise and technical skills. The lack of Commission expertise was confirmed by the quality assurance contractor[18]. Almost half the project staff were on contracts which were due to expire in the coming year. Although none of the Commission staff who responded to the audit survey considered that high staff turnover was an obstacle to good relationships with stakeholders, 49 % of respondents from member countries considered that it was. The 2006 audit by the Commission's Internal Audit Service (IAS)[19] found that SIS II project staff were committed and competent, though constantly overloaded. Following this audit, DG Home Affairs allocated additional staff to the project. By the end of 2007, the SIS II sector in DG Home Affairs comprised 12 permanent staff, increasing to 17 by 2012[20].

12 Council Regulation (EU) No 541/2010 of 3 June 2010 amending Regulation (EC) No 1104/2008 on migration from the Schengen Information System (SIS 1+) to the second generation Schengen Information System (SIS II) (OJ L 155, 22.6.2010, p. 19) and Council Regulation (EU) No 542/2010 of 3 June 2010 amending Council Decision 2008/839/JHA on migration from the Schengen Information System (SIS 1+) to the second generation Schengen Information System (SIS II) (OJ L 155, 22.6.2010, p. 23) extended the project deadline to March 2013.

13 SEC(2010) 1138 final of 21 September 2010.

14 This consisted of the following elements:
(a) Too few Commission staff with experience of large-scale IT projects and Schengen issues (9 %).
(b) Underperformance of the main development contractor (9 %).
(c) Contractual disputes (5 %).
(d) The Commission did not monitor effectively the results of the main development contractor (4 %).
(e) The Commission did not clearly communicate needs to the main development contractor (3 %) .

15 SEC(2003) 206 final of 18 February 2003.

16 COM(2003) 771 final.

17 Note from the Programme Manager to the responsible Director in DG Justice, Freedom and Security of 16 September 2005.

18 Issue follow-up report by the quality assurance contractor, August 2005.

19 Internal Audit Service report of IT Management in DG Justice, Freedom and Security (8 June 2006).

16
The lack of Commission staff with relevant expertise before 2009 was highlighted by all six member countries interviewed during the audit. Two of them, as well as the main development contractor, suggested that the project would have benefited from more IT expertise available elsewhere in the Commission e.g. in DG Informatics. The Commission lacked sufficient expertise to manage the contract effectively and to ensure the quality of deliverables[21].

17
On 22 October 2004, HPS was awarded the contract to develop SIS II and the Visa Information System (VIS). However, on 18 November 2004, it had to suspend work on the contract until 31 January 2005 whilst waiting for the outcome of an appeal by an unsuccessful tenderer. This initial delay was a consequence of the method used by the Commission for evaluating the tenders which did not convincingly demonstrate that the best bid had been accepted (see ***Box 1***). The Court of Justice in the framework of an injunction procedure considered that the Commission had committed errors in the assessment of the tenders but dismissed the unsuccessful tenderer's application for interim measures because there was insufficient evidence to demonstrate that the latter would suffer serious and irreparable damage[22].

20 At the end of 2008 the SIS II sector still comprised 12 staff, increasing to 14 at the end of 2009. At the end of 2010 it comprised 13 staff, increasing to 16 at the end of 2011. In addition the team included contract staff and seconded national experts. For example the 2008 annual management plan of DG Justice, Freedom and Security indicated that there were 9 contract staff and 6 seconded national experts.

21 The June 2006 Internal Audit Service report on IT Management in DG Justice, Freedom and Security found that there were insufficient staff to manage the increasing level of outsourcing.

22 Order of the President of the Court of First Instance, 31 January 2005 in case T-447/04R.

Box 1

The Commission assessed the winning bid as cheaper, even though it was in reality more expensive

The bids were evaluated firstly on the basis of quality (the technical evaluation) and then on price (the financial evaluation).

Out of the seven bids received, HPS and the unsuccessful tenderer who appealed performed best on the technical evaluation. Their scores were roughly equal. HPS's score was 0,4 % higher than the unsuccessful tenderer.

These two companies proceeded to the financial evaluation phase, the results of which were combined with the technical score to arrive at an overall score.

In the financial evaluation HPS's bid was assessed as 43 % cheaper. As a result it received a higher overall score and was awarded the contract.

However, the amount of HPS's bid was, in fact, 3,5 % more expensive than the unsuccessful tenderer's bid (38,1 million euro compared with 36,8 million euro).

The Commission assessed HPS's bid as cheaper, even though it was in fact more expensive, because it divided the tender into 15 parts. The Commission calculated a separate score for each part based on the relationship between the bids of the two contractors. It then added these scores together (without weighting and without any distinction between fixed prices and items which would be ordered separately when required) to give a financial score which bore little relation to the overall bid.

18

The Commission lacked sufficient staff to properly supervise the contract and to prevent the under-performance of the main development contractor[23]. The 2006 audit by the Commission's Internal Audit Service (IAS) was critical of the management of the SIS II project for failing to ensure that the main development contractor delivered on time and according to the specifications. Five of the six member countries interviewed during the audit considered that the Commission lacked sufficient experience to assess the quality of deliverables and monitor the contractor's performance. Only 20 % of respondents to the audit survey considered that, before 2009, the Commission had monitored the results of the main SIS II development contractor effectively. The figure increased to 72 % from 2009, highlighting an improvement in the Commission's ability to monitor quality in the final phase of the project.

23 UK House of Lords, European Union Committee, 9th Report of Session 2006–07, Schengen Information System II (SIS II), Report with Evidence, 2 March 2007. The Commission regretted that it failed to exercise supervision as well as it could in its relations with the main development contractor. With the level of staffing at the time, the Commission stated that it could not supervise the contract properly in order to prevent the under-performance of the main development contractor.

19

The Commission approved test results based on feedback from the main development contractor and the quality assurance contractor. Failed operational tests at the end of 2008 (which were the first tests of the central and national systems involving member countries) revealed problems in the system. In the final phase of the project, the Commission's ability to assess the quality of deliverables through system acceptance tests improved[24] (see ***Figure 3***).

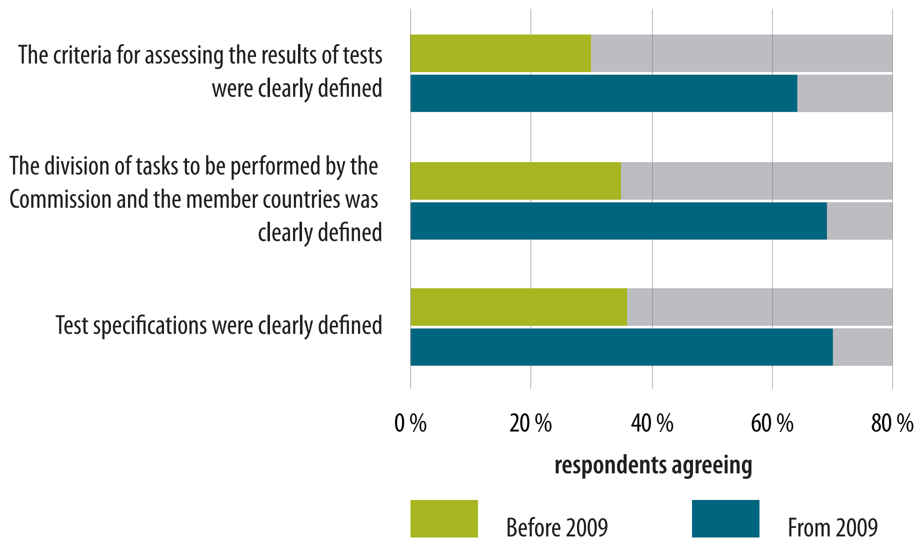
20

All six member countries interviewed considered that, from 2009, the Commission's management and communication had improved. The team which managed the final project phase included more staff with experience of developing large-scale IT projects and with knowledge of the Schengen Information System (e.g. from DG Taxation and Customs Union, from member countries or from the earlier phase of the SIS II project itself). A third of respondents to the audit survey considered that, over the life of the project as a whole, the Commission had allocated sufficient staff with the necessary skills and experience to deliver SIS II successfully. This was a significant improvement compared with a figure of just 10 % at the start of the project (see paragraph 14).

24 Council Conclusions, Justice and Home Affairs, 26 and 27 February 2009 welcomed the review of the SIS II testing approach, guaranteeing an increased involvement of member countries in test design and management.

Figure 3

Improvement in testing procedures from 2009



Source: Audit survey of SIS II stakeholders.

Working relations between some member countries and the Commission were initially poor, and, until the Commission created the Global Project Management Board, it did not manage to draw on the experience of all end-users

21
Survey respondents considered that poor working relations with stakeholders and the lack of commitment of some member countries accounted for some of the delays. They gave a weighting of 17 % to this reason[25] (see ***Figure 2***).

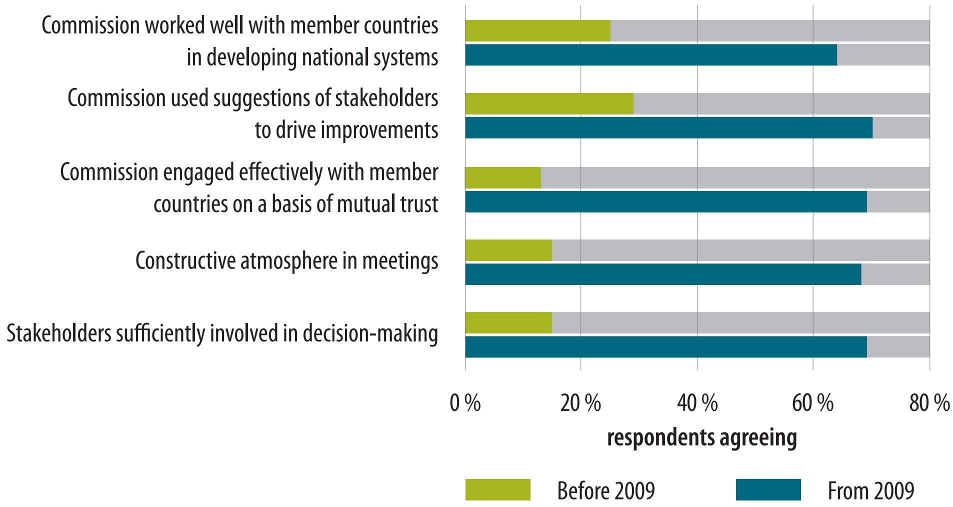
22
Interviews with the member countries highlighted the difficult relations with the Commission. They described, for example, how the SISVIS Committee (see paragraph 27) became the arena for a series of arguments. In the survey, only 15 % of respondents, none from the Commission, considered that, before 2009, the meetings regarding the SIS II project took place in a constructive atmosphere (see ***Figure 4***).

23
The environment in which SIS II was developed before 2009 contrasts with the one in which DG Taxation and Customs Union developed another large-scale IT system at that time (see ***Box 2***).

25 This consisted of the following elements:
(a) Opposition or lack of commitment to the project by some member countries (8 %).
(b) Poor working relations between stakeholders (5 %).
(c) SIS II was not strategically important, particularly after the implementation of SISone4all (4 %).

Figure 4

Poor relations between some member countries and the Commission before 2009



Source: Audit survey of SIS II stakeholders.

Box 2

Key success factors in developing IT systems in DG Taxation and Customs Union

DG Taxation and Customs Union has successfully developed a number of large IT systems for participating countries using its TEMPO methodology[26]. The 2006 report by the Commission's Internal Audit Service on large IT systems in DG Taxation and Customs Union considered the development of the New Computerised Transit System (NCTS) to be an example of best practice in project management. This system exchanges electronic messages between the customs offices of participating countries concerning imported goods, in order to help ensure that customs duties are paid at the final destination. The Commission considered that the NCTS was comparable in scale to the SIS II project[27].

DG Taxation and Customs Union considered that the most important success factor in developing large-scale IT projects, such as the NCTS, was communicating and building both formal and informal relationships with participating countries in order to create a climate of confidence, cooperation and shared determination to achieve results.

26 TAXUD (DG Taxation and Customs Union) electronic management for projects online (TEMPO): a project management methodology developed by DG Taxation and Customs Union.

27 COM(2001) 720 final of 18 December 2001, Annex 1 section 5.1.2 and COM(2003) 771, Annex 3 section 5.1.2.

Source: European Court of Auditors based on interviews with DG Taxation and Customs Union.

24
A number of factors contributed towards the lack of commitment of some member countries and poor working relations:

(a) The Commission was not a user of the system and, even though it recruited some experts from member countries, lacked the detailed knowledge of end-user practices necessary to understand business needs and user requirements.

(b) The Commission did not manage to draw on the experience of all member countries that were end-users and had knowledge of the existing system. Although there were various meetings in which member countries could communicate end-user views to the Commission (e.g. National Project Manager meetings, SIS II Committee, Friends of SIS II and the SIS II Task Force), before 2009, the Commission did not engage effectively with member countries, which felt excluded from decision-making (see ***Figure 4***). All six member countries interviewed considered that the views of end-users were not sufficiently taken into account.

(c) The Commission provided a framework for member countries to communicate with the main development contractor. However, five of the six member countries interviewed considered that this was not effective. In spite of numerous requests from member countries, the Commission did not provide them with a copy of the main development contract until advised to do so by its legal service in 2009.

(d) Some member countries were not convinced that SIS II was necessary.

(e) The poor quality of deliverables affected the member countries' confidence in the Commission's ability to deliver SIS II (see paragraph 16).

25
The survey showed that relations with member countries improved after 2009 (see ***Figure 4***). There were a number of reasons for this change:

(a) The Commission created the Global Project Management Board (GPMB) in 2009 which enabled end-users from member countries to bring their vision and experience to the final phase of the project. The weekly meetings of the GPMB included the Commission, experts from up to eight member countries (representing end-users rather than their own country) and the contractors. The GPMB meetings enabled more frequent interaction between the member countries and the main development contractor.

(b) The Commission's management and communication improved (see paragraph 20).

(c) The 2009 comparison with an alternative scenario provided some additional justification for the continuation of the SIS II project (see paragraph 63).

(d) The main development contractor delivered better results during the final project phase from 2010 (see paragraph 41).

It was not clear to all stakeholders who made key decisions

26
In its 2011 review of the development of SIS II[28], the Centre for European Policy Studies (CEPS) described the governance framework for the project (see ***Figure 5***).

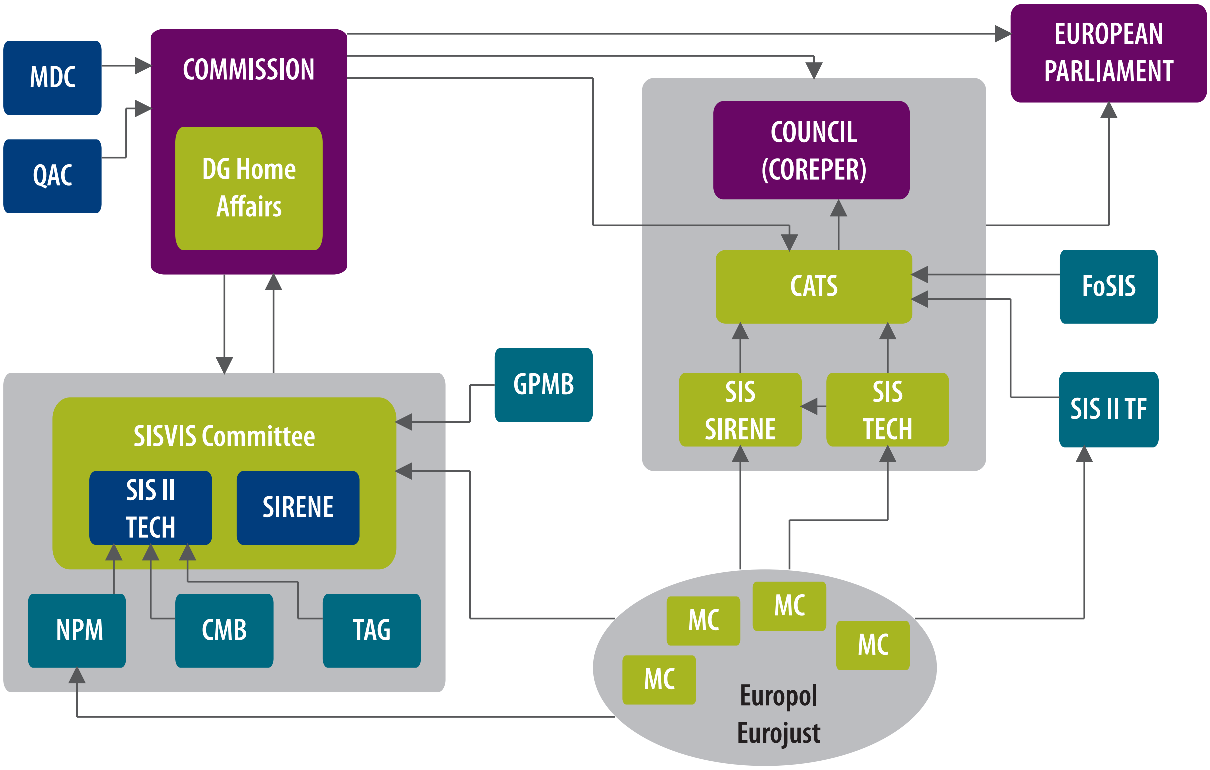
27
According to the 2001 legislation, the Commission was responsible for developing SIS II, assisted by the SISVIS Committee. If the Committee disagreed with certain measures proposed by the Commission, the Council could require the Commission to re-examine its proposal[29]. The 2006 audit by the Commission's Internal Audit Service found that the Commission's ability to address operational issues was limited by the project's steering mechanisms.

28 The Difficult Road to the Schengen Information System II, Joanna Parkin, Centre for European Policy Studies, April 2011.

29 The SISVIS Committee assisted the Commission in the development of the second generation Schengen Information System (SIS II) and the Visa Information System (VIS). Council Decision 2001/886/JHA set down two procedures for making decisions:
(i) A regulatory procedure for major decisions regarding the SIS II architecture, data protection, issues with serious financial or technical implications for the member countries, security issues. If the Committee disagreed with measures proposed by the Commission, the Council could require the Commission to re-examine its proposal.
(ii) A management procedure for all other matters. If the Committee disagreed with measures proposed by the Commission, the Council could take a different decision.

Figure 5

SIS II governance framework from 2010



Notes:

Arrows show reporting lines

NPM	National Project Managers meeting
MC	Schengen member countries
GPMB	Global Project Management Board
FoSIS	Friends of SIS II
MDC	Main development contractor
SIS II TF	SIS II Task Force
QAC	Quality assurance contractor
SIS TECH	Working party on Schengen matters (SIS TECH formation)
TAG	Test Advisory Group (advisory working group of the SISVIS Committee)
SIS SIRENE	Working party on Schengen matters (SIS SIRENE formation)
CMB	Change Management Board (advisory working group of the SISVIS Committee)
CATS	Article 36 Committee
SISVIS Committee	Committee assisting Commission to develop SIS II and the Visa Information System (VIS)
SIS II TECH	SIS II TECH formation of SISVIS Committee
SIRENE	SIRENE formation of SISVIS Committee

Source: Centre for European Policy Studies and DG Home Affairs.

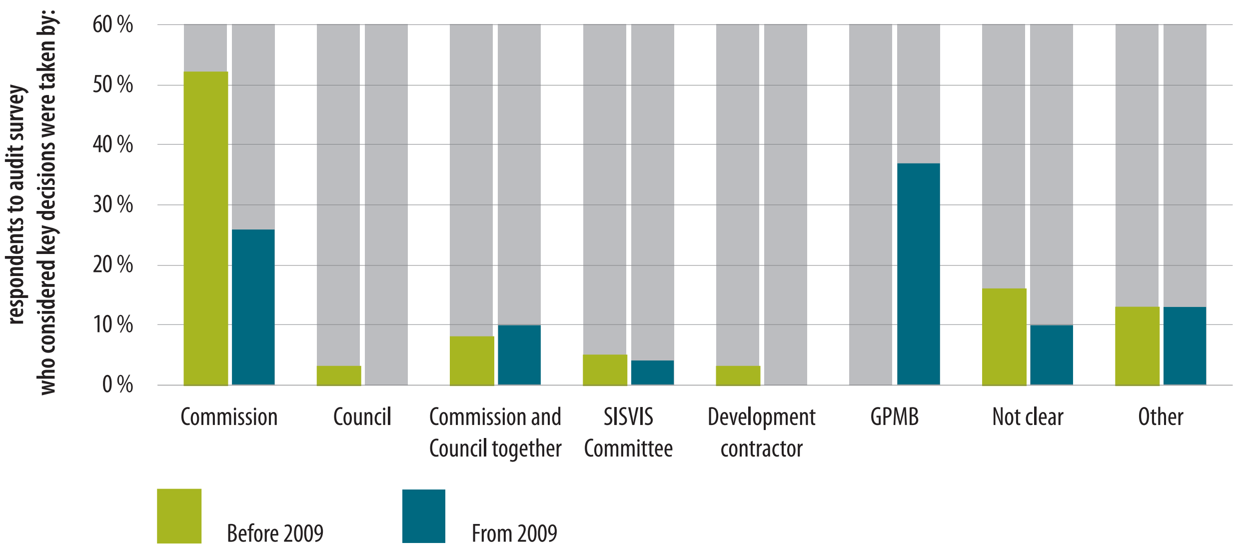
28
It was not clear to all SIS II stakeholders who made key decisions in practice. Although the minutes of SISVIS Committee meetings were recorded, there was no decision log to enable the basis for all important decisions to be easily traced and understood. Half of the respondents to the audit survey considered that it was the Commission who had made key decisions in the period to 2009 (see ***Figure 6***). After the creation of the Global Project Management Board in 2009, this figure fell to 24 %. Although this was an advisory rather than a decision-making body, 34 % of respondents thought it made the key decisions. Respondents to the survey considered that complex and unclear decision-making accounted for some of the delays. They gave a weighting of 11 % to this reason (see ***Figure 2***).

System requirements were not sufficiently stable until the final project phase

29
Respondents to the survey considered that the instability of system requirements accounted for some of the project delays. They gave a weighting of 22 % to this reason (see ***Figure 2***).

Figure 6

Stakeholder perceptions of who took key decisions in practice



Source: Audit survey of SIS II stakeholders.

30

The tender specifications, published in June 2003, provided an initial outline of the system architecture and functional, technical, performance and migration requirements. On the basis of these specifications, HPS was awarded the contract to develop the central system in October 2004. It then began work on Phase I[30], the design of the detailed specifications. However, subsequent changes to the system requirements necessitated amendments to the development contract, which contributed to delays.

31

For example, in December 2006, legislation on the establishment, operation and use of SIS II included an additional capability, the 'data amnesty', to meet the needs of users. This allowed member countries a period of 3 years to ensure that alerts transferred from SIS 1 complied with the provisions of the legislation[31]. The data amnesty was not part of the tender specifications and was incorporated in an amendment to the contract[32].

32

Some changes, such as the increase in capacity, were partly linked to the longer than expected duration of the project. The initial 2004 contract was for a system to be launched in 2006 which could handle 15 million alerts and be increased to 22 million alerts without technical changes. After 2007, there was a sharp increase in the rate of growth in the number of alerts, which led to changed requirements regarding system capacity. The amendment for the final project phase was for a system which could handle 70 million alerts and could be scaled up to 100 million, based on the projections of a volumetric study carried out by the Commission in 2009. At migration in April 2013, there were 46 million alerts. ***Figure 7*** shows the evolution of the number of records in the SIS database.

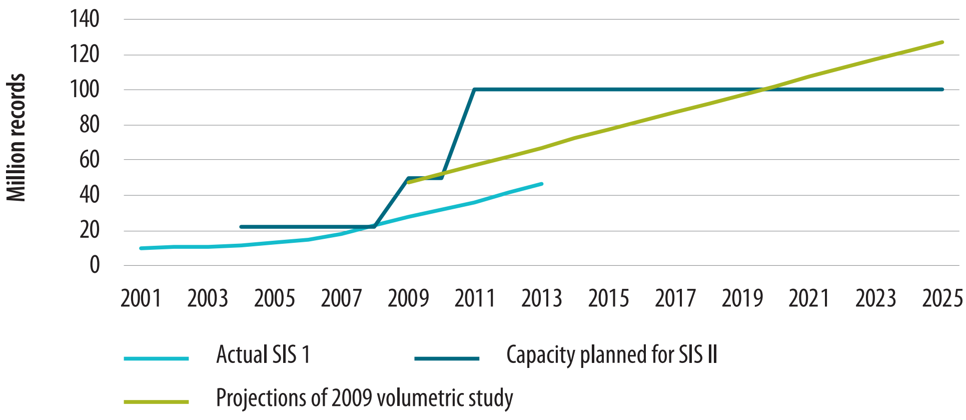
30 The contract was divided into two phases: Phase I was concerned with the technical design; Phase II concerned system development and delivery.

31 Article 54(1) of Regulation (EC) No 1987/2006 of the European Parliament and of the Council of 20 December 2006 on the establishment, operation and use of the second generation Schengen Information System (SIS II) (OJ L 381, 28.12.2006, p. 4) and Article 70(1) of Council Decision 2007/533/JHA of 12 June 2007 on the establishment, operation and use of the second generation Schengen Information System (SIS II) (OJ L 205, 7.8.2007, p. 63).

32 Amendment No 4 of 30 April 2008 to contract JAI-C3-2003-01.

Figure 7

Evolution of the number of records in the SIS database



Source: European Court of Auditors based on Council statistics, SIS II documentation and Commission 2009 volumetric study.

Section 2 — The cost of developing the central system and network increased from 23 million euro to 189 million euro

Audit criteria

33

The audit examined whether:

(a) the Commission had produced a realistic initial budget;

(b) the Commission had avoided delays resulting in increased costs;

(c) the Commission had ensured the contractor delivered products on time to the required quality;

(d) requirements had been stable;

(e) any additional work had been good value for money.

The Commission did not update its 2003 global project budget until 2010

34

In June 2001 the Council estimated that it would cost 14,6 million euro to develop SIS II. The Commission's Communication of December 2001[33] increased this figure to 23 million euro. Two years later, the Commission estimated that it would cost 35,3 million euro[34]. By the end of the project in 2013, the estimated cost for developing the system amounted to 188,6 million euro (see ***Figure 8***).

33 COM(2001) 720 final.

34 COM(2003) 771 final.

Figure 8

Evolution of the SIS II budget

(million euro)

	2001 Council Regulation and Decision	2001 Commission Communication	2003 Commission Communication	2010 Commission Staff Working Document	Commitments to end of project April 2013
Design, development and migration	14,6	17,2	31,3	124,5	122,8
Network		1,0			45,3
Total contracts	**14,6**	**18,2**	**31,3**	**124,5**	**168,1**
Commission staff and administrative expenses	Not available	4,8	4,0	20,5	20,5 (based on 2010 estimate)
Total	**14,6**	**23,0**	**35,3**	**145,0**	**188,6**

Source: European Court of Auditors based on SIS II documentation.

35
The Commission emphasised that its initial cost estimate in 2001, based on the information available at the time, was provisional, and described it as a working hypothesis. It was updated in December 2003 to take into account more recent information, including the feasibility study. However, it remained a working hypothesis, which could increase because of decisions on user requirements or the need for external support to meet the tight schedule.

36
The Commission did not present a more realistic revised estimate when it had more complete information on the design of the system and the network and when it realised the difficulty and complexity of the project and its environment. For example, the cost of the network was estimated at 1 million euro in 2001 and was not included in the 2003 estimates on the basis that the cost was covered elsewhere in the Community budget. In May 2005 the Commission presented a budget of 132 million euro for **the running costs** of SIS II in the period 2007 to 2013, following its planned launch in early 2007[35]. This contained information that the network costs for a dedicated line to national SIS II access points would amount to 6 million euro per year. However, there was no further presentation of the global project budget for **the development** of SIS II until 2010 when the Commission set out commitments to date and the costs likely to be incurred to complete SIS II[36].

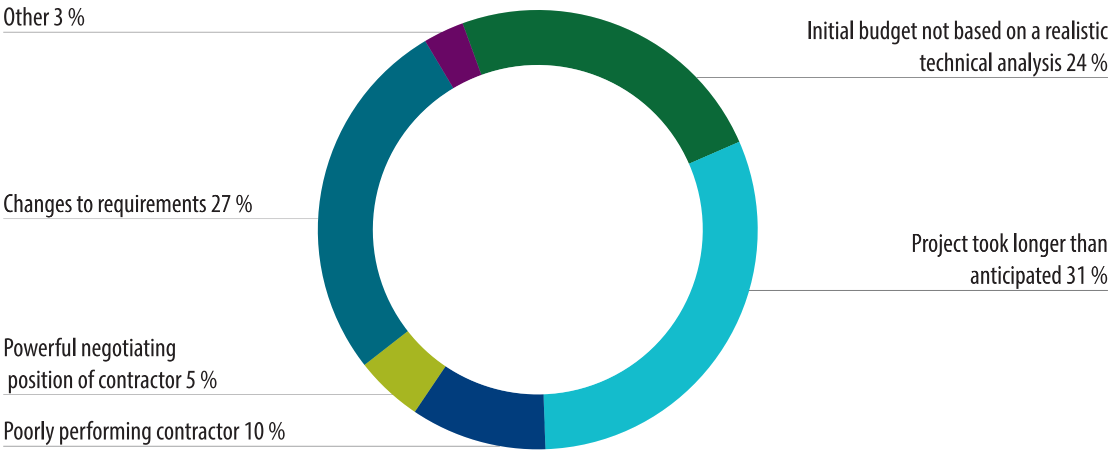
37
In the survey, although most respondents were not involved in the SIS II project in 2001, 57 % considered that the initial project budget of 23 million euro was unrealistic, based on the information available at the time. It was, for example, based on an unrealistic deadline (see paragraphs 9 and 10) as was the revised estimate in 2003. Respondents to the audit survey were asked to weight the reasons for the increase in the costs of developing the central system. They considered that part of the increase was because the initial budget was not based on a realistic technical analysis. They gave a weighting of 24 % to this reason (see ***Figure 9***).

35 COM(2005) 236 final of 31 May 2005 and COM(2005) 236 final/2 of 23 August 2005. The budgetary envelope of 132 million euro in the financial statement covered the running costs of the central SIS II system and the network and also included 40 million euro for the development and operation of a search engine based on a biometric identifier.

36 SEC(2010) 436 final of 12 April 2010.

Figure 9

Reasons for the increase in costs of central SIS II



Source: Audit survey of SIS II stakeholders.

The delays in delivering SIS II resulted in increased costs

38

SIS II was initially planned to be completed by December 2006 to meet the needs of new member countries, but it was delivered over 6 years late in April 2013 (see paragraphs 9 to 32). In the survey, respondents considered that the long extensions to the project deadline accounted for part of the increase in costs. They gave a weighting of 31 % to this reason (see ***Figure 9***). A longer project duration resulted in an increase in certain costs such as quality assurance and the use of the network. Although the main development contract was to develop SIS II for a fixed price, the delays resulted, for example, in the need for upgrades (see paragraph 43) and increased capacity to handle the sharp increase in the number of alerts from 2007 (see paragraph 32). The factors which contributed to the delays of SIS II therefore also contributed to the increase in costs.

The main development contractor delivered an underperforming system in the first part of the project

39
The Commission had insufficient resources to supervise the main development contractor effectively (see paragraph 18). In 2005, member countries highlighted the poor quality of the first documents delivered by HPS[37]. Five of the six member countries interviewed, as well as the quality assurance contractor, considered the initial specifications provided by HPS were poor quality. The failure of the operational system tests (OST) in December 2008 showed that HPS had delivered an underperforming system (see paragraph 19). Its failure to deliver on time to the required quality contributed towards project delays, which resulted in increased costs (see paragraph 38). Survey respondents considered that part of the cost increase was due to the poor performance of the main development contractor. They gave a weighting of 10 % to this reason (see ***Figure 9***).

40
The Commission could only impose liquidated damages on HPS amounting to 390 000 euro (which represented less than 0,5 % of the final contract value of 82,4 million euro[38] (see paragraph 44)) for its specific failure to deliver the OST report on time. Other performance problems were not subject to financial penalties[39].

41
The main development contractor passed the first milestone test in March 2010 and successfully implemented the final phase of the project, including the second milestone test in May 2012 (see paragraph 63). Although only 11 % of respondents to the survey considered that the Commission engaged effectively with the main development contractor in the period before 2009, this proportion rose to 64 % for the period from 2009. Four of the six member countries interviewed during the audit commented on the positive impact of the change in the management team of the main development contractor to implement the final project phase from 2010.

Changes to system requirements resulted in increased costs

42
Survey respondents considered that part of the increase in costs was due to additional or changed requirements, such as the introduction of the data amnesty or the increase in capacity (see paragraphs 31 and 32). They gave a weighting of 27 % to this reason (see ***Figure 9***).

37 Comments on the Commission's progress report for SIS II, Council of the European Union note from SIS-TECH WG to SIS-SIRENE WG, 8861/05 of 13 May 2005.

38 For the VIS contract with HPS, which was combined with the SIS II contract, the Commission imposed liquidated damages of some 9 million euro, representing over 20 % of the VIS contract value.

39 The June 2006 Internal Audit Service report on IT Management in DG Justice, Freedom and Security noted that the DG perceived the quality of deliverables as insufficient. It recommended that payments made for deliverables should better reflect the work performed and that future contracts should have an effective penalty mechanism to ensure the timely delivery of deliverables that meet basic quality standards.

43

Changes to requirements necessitated amendments to the main development contract and had cost implications. The data amnesty cost 505 000 euro. The most significant amendment was No 15 in December 2010 amounting to 35,0 million euro for the final project phase. This amendment entailed significant redevelopment[40] and incorporated new requirements regarding the system capacity, performance, testing strategy, interface control document, upgrades of software and system migration[41].

The Commission increased the value of the main development contract from 20 million euro to 82 million euro through negotiated amendments

44

The value of the initial contract with HPS to develop SIS II in October 2004 was 20,3 million euro[42]. The contract was for a fixed price and did not contain prices for smaller, carefully defined work packages which could be used as the basis for adjusting the project without renegotiations. Amendments to the contract quadrupled its value to 82,4 million euro by 2013[43]. ***Figure 10*** shows the evolution of the value of the main SIS II development contract.

40 Conclusions of the first meeting of the evaluation committee on the negotiated procedure C2-2009-01 SIS II, 17 September 2010.

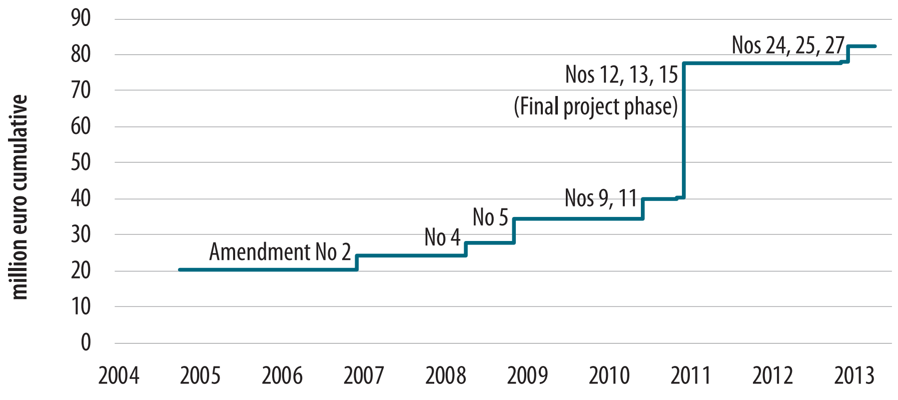
41 SEC(2010) 1138 final.

42 3,3 million euro for Phase I (the detailed technical design) and 17,0 million euro for Phase II (system development and delivery).

43 There were a total of 27 amendments to the main development contract for SIS II and VIS (the contracts for both systems were combined in a single agreement).

Figure 10

Value of the main SIS II development contract



Source: European Court of Auditors based on SIS II contract amendments.

45

Amendments agreed between 2006 and 2008 increased the value of the contract with the main development contractor by 14,1 million euro (69 %) to 34,4 million euro (see ***Figure 10***). Before the first increase of 4 million euro in December 2006 (amendment No 2), DG Home Affairs sought the advice of DG Budget on whether it could negotiate an increase in the contract value with the contractor. DG Budget advised that, under Article 126(1)(e) of the Rules implementing the Financial Regulation, DG Home Affairs could negotiate amendments for additional services which were not in the initial contract but which had become necessary. Under this article, the total value of amendments could not exceed 50 % of the amount of the initial contract[44]. The initial value of the SIS II contract was 20,3 million euro, so the total value of amendments agreed under Article 126(1)(e) could not exceed 10,2 million euro.

46

In 2008 the total value of amendments reached the 50 % limit. DG Home Affairs negotiated subsequent amendments under Article 126(1)(b) of the Rules implementing the Financial Regulation[45]. This article had no ceiling on the total value of amendments. However, it could only be applied on the condition that the contract could only be awarded to one particular company (referred to as a technical lock-in).

47

The tender specification for SIS II had not planned the system as a set of building blocks which could easily be reused by another contractor[46]. DG Home Affairs decided that, for technical reasons, the contract for the 35,0 million euro amendment in 2010 for the final project phase could only be awarded to the main development contractor, HPS. It considered that no other contractor would have been able to deliver SIS II to the required quality and within the timeframe for the same price. In addition, a new tendering exercise would have required more time. Moreover, the Commission considered that because the SIS II contract was combined with the contract for the Visa Information System, terminating the contract for SIS II could have had a disruptive effect on the development of the latter.

48

The Commission considered that, from a sound financial management point of view, it could not justify a new competitive tendering procedure. As a result, it increased the value of a contract, with a contractor who had delivered an underperforming system in 2008, from 20,3 million euro to 82,4 million euro[47]. This was done through a series of negotiated amendments. Whilst this procedure is provided for in the Financial Regulation, there is an inherent risk with any negotiated procedure that the prices paid are not competitive.

44 Article 126(1)(e) of the Implementing Rules to the Financial Regulation states that contracting authorities may use the negotiated procedure (i.e. no competition) for additional services which were not in the initial contract but which, through unforeseen circumstances, have become necessary to complete the performance of the services and which cannot be separated from the main contract without serious inconvenience. The total value of additional contracts may not exceed 50 % of the amount of the initial contract.

45 Article 126(1)(b) of the Implementing Rules to the Financial Regulation states that contracting authorities may use the negotiated procedure (i.e. no competition), where, for technical or artistic reasons, or for reasons connected with the protection of exclusive rights, the contract can be awarded only to a particular company.

46 This component-based approach is described in the software development methodology used in the European Commission (RUP@EC).

47 In 2012 amendments of 4,7 million euro brought the total value to 82,4 million euro.

49
Aware of this risk, the Commission took steps, in negotiating amendment No 15 for the final project phase, to provide some assurance that the price was reasonable. The initial offer submitted by HPS was for 49,9 million euro. Once consensus on the content of the offer had been achieved, the Commission made its own estimate of 25,8 million euro. It then compared the prices of a sample of 10 % of hardware items with those in a framework contract managed by DG Informatics[48]. It found that prices proposed were twice as high and was able to benefit from the best customer clause guaranteeing the best price to the Commission. As a result of these measures it reduced HPS's initial offer of 49,9 million euro by 30 % to 35,0 million euro. Competitive tendering might have saved even more.

Section 3 — The Commission did not ensure that the business case for SIS II included a thorough reassessment of the costs and expected benefits, updated to take into account major changes

Audit criteria

50
The audit examined whether the Commission reassessed the business case for SIS II when major changes occurred to the costs and the expected benefits.

After being made responsible for the project, the Commission's updated business case for SIS II did not include a thorough reassessment of all costs, expected benefits and alternatives

51
The Schengen countries took the decision to develop SIS II in December 1996 on the basis of a comparison with the advantages and disadvantages of extending SIS 1. The cost estimates for SIS II included an estimate of the cost of developing national systems and recognised that they would far exceed the costs of developing the central system[49].

48 Mail from DG Home Affairs to the main development contractor, 7 September 2010.

49 SCH/OR.SIS(96) 165 of 15 December 1996, Note from the Presidency of the SIS Steering Committee estimated the cost of the new central system to be 50–60 million French francs (8–9 million euro) and the cost of each new national system to be 20–25 million French francs (3–4 million euro).

52

In 2001 the Council described the costs and benefits of SIS II in the following terms[50]:

(a) It would cost 14,6 million euro to develop the central system.

(b) The primary reason for developing SIS II was to link up the increased number of member countries after enlargement. SIS II was also to benefit from the latest technological developments and new functions.

53

Most survey respondents (76 %) found this initial justification for SIS II convincing and considered that the benefits justified the costs. In 2001, there was no requirement for the SIS II project proposal to be submitted to DG Informatics for approval. Corporate IT governance and controls were strengthened within the Commission in 2004 through a Communication on IT governance[51], which recommended that DG Informatics should provide an opinion on the development of any new information systems being planned by directorates-general independent of budget source (whether administrative or operational). In practice, from 2004, this procedure was followed only by projects financed from the administrative budget, but generally not by projects, like SIS II, financed from operational budgets[52].

54

After being made responsible for the development of SIS II, the Commission issued Communications in December 2001 and December 2003 which built on the justification in the 2001 legislation and revised the estimate of costs (see ***Figure 8***). However, the Commission's updated business case for SIS II did not include a thorough examination of the costs, benefits and alternatives:

(a) The initial indicative cost estimates, not revised until 2010, significantly underestimated the true scale of the investment necessary — some 500 million euro by the end of the project: 189 million euro for developing the central system (see paragraph 34), and an estimate of over 330 million euro for developing national systems[53]. The cost of developing national systems was met from national budgets, but included support of 95 million euro from the EU External Borders Fund. National systems are an integral part of the Schengen Information System as the main end-users of SIS II will have access to the central system via their national system (see ***Figure 1***). Although the Commission was not responsible for delivering national SIS II projects, their coordination was essential in order for the project to succeed[54]. This was recognised by the member countries in their initial 1996 proposal for SIS II (see paragraph 51). However, neither the initial, nor any subsequent, estimate presented by the Commission included the cost of their development.

50 Council Regulation (EC) No 2424/2001, Council Decision 2001/886/JHA and initiative of the Kingdom of Belgium and of the Kingdom of Sweden with a view to the adoption of a Council Regulation on the development of the second generation Schengen Information System (SIS II) (9844/2001).

51 SEC(2004) 1267. Corporate IT governance and controls were strengthened through further Communications in 2010 and 2011 partly as a response to the awareness of the reputational risk raised by the implementation of large-scale IT projects: SEC(2010) 1182 and SEC(2011) 1500 of 30 November 2011.

52 The Methodology, Architecture, Portfolio Management Working Group (MAP) chaired by DG Informatics should review project definition documents produced by DGs before the administrative budget is released.

53 A 2009 report to the SIS-TECH Working Group (8708/09 of 19 May 2009, note from Presidency on Alternative Scenario Assessment Paper SIS 1+RE) estimated that costs invested by member countries on national SIS II systems until May 2009 amounted to 170 million euro. Estimates by the member countries in the context of the Commission's mid-term evaluation of the External Borders Fund identified further investments in SIS II national systems of some 160 million euro between 2009 and 2012. The total investment is considerably higher, as figures for Denmark, Estonia, Germany, Greece, Luxembourg, the Netherlands, Portugal, Spain and Switzerland were not available. Out of this total investment in national systems of over 330 million euro to the end of 2012, the Commission, through the External Borders Fund, provided 76 million euro and a further 19 million euro in 2013.

(b) It did not set out the benefits of SIS II in terms of its contribution to fighting crime or strengthening external borders. It did not state the problems SIS II was designed to address and how its success would be measured.

(c) It did not consider alternative scenarios. For example, there was no explanation of why it was not possible to extend SIS 1 to additional member countries. Five of the six member countries interviewed during the audit considered that SIS 1 could have been extended to the new member countries. When SIS II was not available as planned at the end of 2006, SIS 1 was in fact modified and SISone4all was launched in December 2007 to incorporate the new member countries (see paragraph 11).

The Commission did not thoroughly reassess the business case during the project even though there were major changes to the costs and expected benefits

55

Key decisions such as the 2004 decision to begin detailed planning, the 2005 decision to activate Phase II of the project[55], and the 2009–10 decision to continue SIS II after the comparison with SIS 1+RE (see paragraphs 62 and 63) were made within the decision-making framework of the project. The corporate mechanism introduced in the Commission from 2010 for deciding whether to continue with, or stop, an IT project was not applicable to the SIS II project[56]. Decisions to continue the development of SIS II were financed within the budget approved for the running costs of SIS II after its launch (see paragraph 36)[57]. Decisions to continue the SIS II project did not involve a thorough reassessment of the overall costs and expected benefits even though there were major changes to them.

56

The costs of developing the central system were much higher than initially estimated (see paragraphs 34 to 49). The longer than expected duration of the project also led to additional costs for upgrading SIS 1 (see paragraph 59). Delays and changes to the design of SIS II also increased the cost of developing national systems. Four of the six member countries interviewed described how they had purchased material for their national system which had not been used because it had become obsolete. In the audit survey, 74 % of respondents from member countries considered that the need to find additional funds to finance the repeated changes and extensions to the project deadline put at risk the development of their national systems.

54 The SIS II project plan, 3 March 2008, describes how the SIS II project also included the coordination of the national preparation in each country participating in SIS II. It states that 'the Commission is not in charge of delivering these projects but since national preparation impacts the SIS II project it is viewed as essential'.

55 Initially the development contract covered Phase I only (design). The activation of Phase II (development and delivery) was at the discretion of the Commission based on the results of Phase I and the availability of the budget.

56 The Information Systems Project Management Board (ISPMB), chaired by the Director-General of DG Informatics, reviews the annual progress reports of major IT projects and provides early warning on difficulties encountered. DG Home Affairs agreed with the Commission's IT governance bodies that the ISPMB was not applicable to the SIS II project.

57 COM(2010) 633 final of 5 November 2010, COM(2011) 391 final of 29 June 2011.

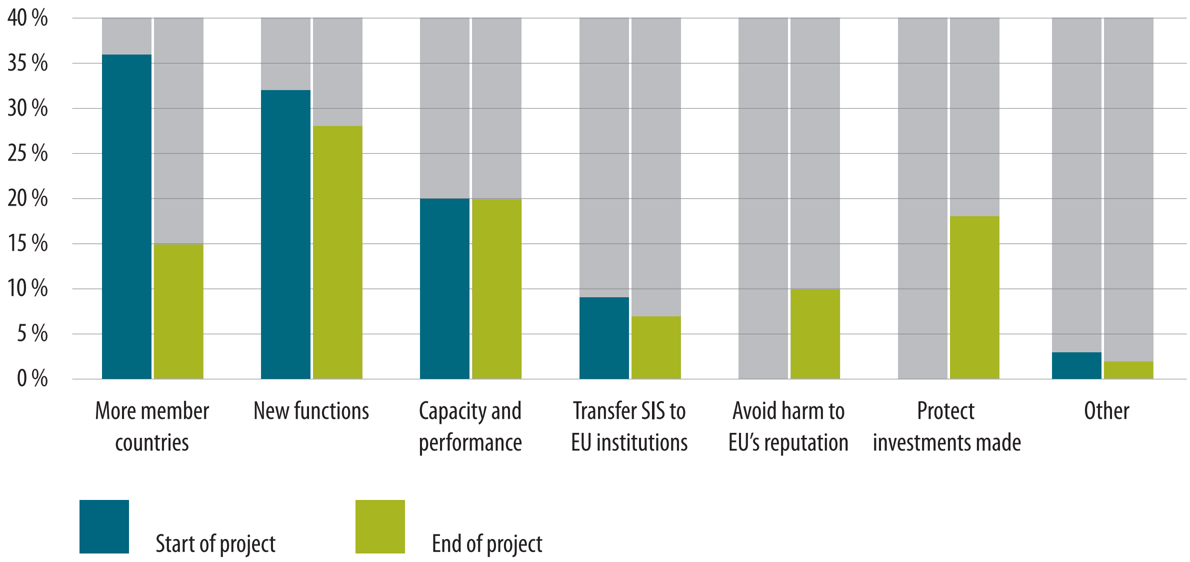
57

Whilst the costs of SIS II increased, the main expected benefit (connecting the increased number of member countries after enlargement) was less important because of the implementation of SISone4all in 2007 (see paragraph 11). In the audit survey, respondents were asked to weight the justifications for developing SIS II at the start and at the end of the project. Respondents considered that the most important justification at the start of the project was linking up more member countries. However, by the end of the project the importance of this justification had fallen from 36 % to 15 % (see ***Figure 11***). Other reasons for developing SIS II were also different at the end of the project from the start. For example, the avoidance of harm to the EU's reputation[58] and the protection of investments already made were significant at the end of the project.

58 DG Home Affairs' 2011 Annual Activity Report included a reservation concerning the reputational damage to the Commission from SIS II.

Figure 11

Justification for developing SIS II



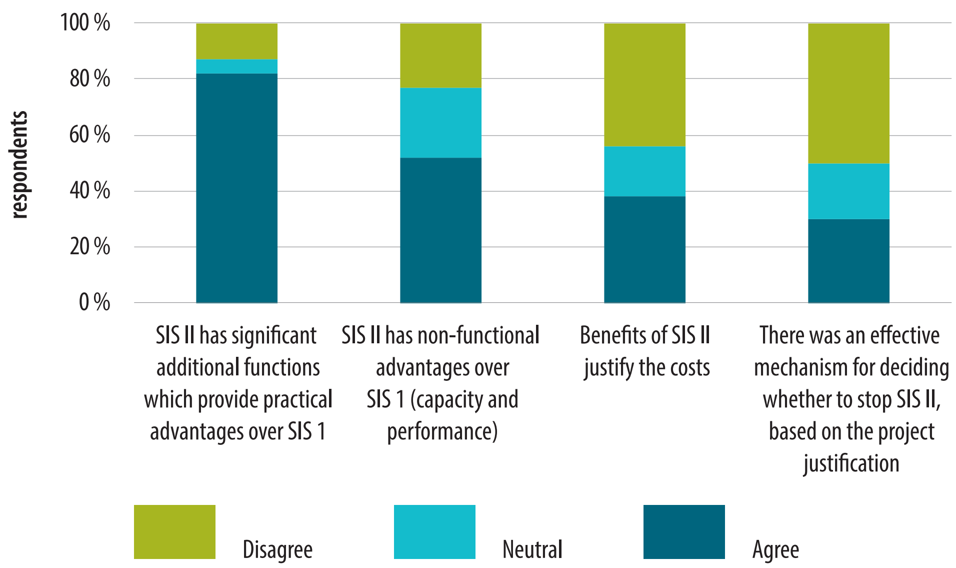
Source: Audit survey of SIS II stakeholders.

58
The second most important justification for SIS II at the start of the project (providing new functions) became the most important justification by the end. SIS II provides end-users with new functions such as new categories of alert (stolen aircraft, boats, containers, means of payment), the facility to link alerts (such as an alert on a person and a vehicle) and the capacity to store documents associated with an alert (e.g. European arrest warrants) including biometric information. 82 % of respondents considered that SIS II had significant additional functions which provided end-users with immediate visible practical advantages over SIS 1 (see ***Figure 12***).

59
However, by the end of the project, apart from the new functions, respondents were less certain about the benefits of SIS II compared with SIS 1. Respondents to the survey considered that the second most important justification for SIS II by the end of the project were the non-functional advantages including greater capacity and performance. However, just 52 % of respondents considered that SIS II has significant non-functional advantages over SIS 1 (see ***Figure 12***). This was because there had been a number of upgrades to SIS 1 due to the delays in developing SIS II (see the chronology in the ***Annex***):

Figure 12

Advantages of SIS II over SIS 1



Source: Audit survey of SIS II stakeholders.

(a) In 2006 when the hardware was renewed and functions added it was renamed SIS 1+R.

(b) In 2007 additional member countries were connected via SISone4all.

(c) In 2011, due to expired maintenance contracts, SIS 1+R was redesigned and reprogrammed in Java (instead of the previous C++). Two of the six member countries interviewed during the audit considered that the performance of the new modular system, renamed SIS 1+R2, was equivalent to that of SIS II.

60

By 2009 SIS II was already 2 years beyond the initial deadline, the costs had increased, the expected benefits had diminished, and the system had failed the operational system tests at the end of 2008. Despite the difficulties, delays and cost increases, most stakeholders wanted to continue to build SIS II. Only 19 % of respondents to the audit survey considered that the development of SIS II should have been stopped. Nevertheless, the project had arrived at a major decision point, and, in February 2009, the Council Presidency called for careful consideration of alternative scenarios[59].

61

There was, however, no decision on whether to continue with, or stop the project based on an analysis of costs and benefits. Only 30 % of respondents to the survey considered that an effective mechanism for making such a decision existed (see ***Figure 12***). The Commission did not reassess the overall costs (including the costs of developing national systems) and the expected benefits of SIS II (including its contribution to strengthening the security of the EU). It did not demonstrate that the project remained an organisational priority which provided a higher return on investment than any other opportunities. In the audit survey, only 38 % of respondents considered that the expected benefits of SIS II justified the final costs of its development (see ***Figure 12***).

62

Although it did not reassess the overall costs and benefits of SIS II, in May 2009 the Commission contributed to a comparison with the alternative scenario of SIS 1+RE, which involved modifying SIS 1+R to include SIS II functions[60]. This acknowledged, for the first time, that there was an alternative to SIS II[61]. The Commission recognised that the financial implications for the member countries' national SIS II projects were considerable, however the comparison did not include the costs of developing national systems[62]. Five of the six member countries interviewed during the audit perceived the comparison as unfairly weighted in favour of continuing SIS II. They considered that the comparison underestimated the time and the cost necessary to complete SIS II and emphasised the difficulties of switching to SIS 1+RE.

59 Council document 6067/09, 3.2.2009, note from Presidency on SIS II implementation measures.

60 Council 10005/09 of 20 May 2009, Note from Presidency and Commission Services to Article 36 Committee, Report on the further direction of SIS II and SEC(2010) 436 final.

61 The options explored, for example, in the Commission Staff Working Paper of 31 August 2006 on global SIS II rescheduling all involved the continued development of SIS II. In November 2006 the Commission insisted that it was technically not possible to add on new functions to SIS 1. See House of Lords, European Union Committee, 9th Report of Session 2006–07, Schengen Information System II (SIS II), report with evidence, 2 March 2007 reply to question 441.

62 Council Conclusions, Justice and Home Affairs, 26 and 27 February 2009.

63
In June 2009 the Council decided to continue with SIS II[63]. However, it introduced two milestone tests and a mechanism to stop the development contract and to switch to the alternative scenario of SIS 1+RE if the system failed one of the tests[64].

Section 4 — The Commission learnt lessons from its experience during the first part of the project to complete SIS II and prepare future projects

Audit criteria

64
The audit examined whether the Commission had carried out an evaluation of the SIS II project. It examined whether lessons learnt from the experience of managing SIS II were applied to later stages of the project, to other IT projects in the Commission and to the new Agency for large-scale IT systems (eu-LISA).

The Commission applied lessons from the first part of the project to the final phase

65
The Commission applied knowledge, experience and understanding acquired during the first part of the project to successfully deliver the final project phase. The audit survey highlighted a clear distinction between the first part of the project to 2009 and the final project phase from 2010. ***Figure 13*** shows how the Commission changed its approach in the final phase of the project in order to address the reasons for the delays and cost increases and complete SIS II. Two of the six member countries interviewed commented that the final project phase was managed in a way that was appropriate to a large-scale IT project.

63 Council 10708/09 of 5 June 2009, Council Conclusions on the further direction of SIS II.

64 The system passed the first milestone test in March 2010 and the second milestone test in May 2012.

Figure 13

Lessons learnt from the unsuccessful first part of the project

Reason for delays and increased costs in SIS II	Changed approach in final project phase from 2010
Unrealistic deadline	The deadline of March 2013 to complete the project, valid from June 2010, was realistic and was met
Lack of Commission expertise to manage outsourced development work effectively	Commission allocated more resources to the project and was able to recruit staff with relevant experience (e.g. from SIS II itself, from DG Taxation and Customs Union and from member countries)
The relations between some member countries and the Commission were poor and it did not secure their commitment	The 2009 comparison with SIS 1+RE provided some additional justification for the continued investment The creation of the Global Project Management Board in 2009 enabled the Commission to draw more fully on the experience of end-users in member countries
Instability of the system requirements	System requirements were stable during the final project phase

Source: European Court of Auditors based on survey of SIS II stakeholders.

The Commission has already applied lessons from SIS II to other projects

66
The Commission has not carried out a formal evaluation with representatives of all stakeholders to identify lessons learnt from its management of the project. However, it has applied some lessons learnt from SIS II to other projects at the Commission in the following ways:

(a) through project management guidelines;

(b) through communications drawing general lessons from SIS II to be applied to the development of future IT systems in the area of freedom, security and justice;

(c) by already taking specific measures when planning future large-scale IT systems.

67

The Commission's latest **project management methodology** (PM2)[65] emphasises procedures which were lacking in SIS II such as:

(a) the important role of the business manager in ensuring user needs are met.

(b) the approval by the project steering committee of the transition of a project through approval gates at the end of the initiating, planning and executing phases.

68

Communication 2011(680) on smart borders[66] insisted that lessons learnt from the development of large-scale IT projects like SIS II should be taken into account in the development of the entry/exit system (EES) and the registered traveller programme (RTP). **Communication** 2010/385 concerning an overview of information management in the area of freedom, security and justice[67] described how the Commission would develop future IT systems. It used the example of SIS II to highlight the following two key lessons:

(a) the need for requirements to be set out in legislation before development work starts;

(b) the importance of an effective governance structure.

69

In planning the smart borders project the Commission has already taken the following **concrete steps**, reflecting lessons learnt from SIS II:

(a) The legislative financial statements for the entry/exit system and the registered traveller programme planned to meet the cost of developing national systems from the EU budget.

(b) The new Agency for large-scale IT systems (eu-LISA)[68], which became responsible for managing and maintaining SIS II after its launch, is intended to bring together the expertise required to develop future systems and so limit the risk of problems such as those which arose during the development of SIS II[69]. In the audit survey, 68 % of respondents considered that the creation of the new agency would facilitate the development of future large-scale IT systems. However, all member countries interviewed during the audit highlighted the fact that relations with member countries would be a key challenge for the new agency. As it is a regulatory agency, it does not fall under the Commission's corporate IT governance arrangements[70].

65 PM^2 is the project management methodology recommended to directorates-general by DG Informatics since 2011.

66 COM(2011) 680 final of 25 October 2011.

67 COM(2010) 385 final of 20 July 2010.

68 Regulation (EU) No 1077/2011 of 25 October 2011 establishing a European Agency for the operational management of large-scale IT systems in the area of freedom, security and justice (OJ L 286, 1.11.2011, p. 1).

69 COM(2011) 680 final.

70 SEC(2012) 492 e-Commission 2012–2015 states that all Commission information systems, including offices and **executive** agencies, whether financed under operational or administrative budgets, are subject to the IT governance arrangements of the Commission.

Conclusions and recommendations

70

The Council charged the Commission with the development of SIS II and fixed the target date for completion as December 2006. This was to enable the new member countries, which were to join the EU in 2004, to become part of the Schengen Area. However, the Commission delivered the central system over 6 years later than planned, in April 2013, and at 8 times the initial budget cost. The delay and overspending resulted partly from the challenging governance context which limited the Commission's ability to address operational issues and partly from weaknesses in the Commission's management. This was particularly the case in the first part of the project to 2009:

(a) The initial project deadline was unrealistic (see paragraphs 9 to 12).

(b) The Commission did not update its 2003 global project budget until 2010 (see paragraphs 34 to 37).

(c) System requirements evolved during the project to meet the needs of users and were not sufficiently stable until the final project phase from 2010. The system now in operation has a much larger capacity than the one foreseen in 2001 (see paragraphs 29 to 32 and 42 to 43).

(d) The Commission did not at first allocate sufficient staff with the expertise to manage outsourced development work effectively (see paragraphs 13 to 20).

(e) The main development contractor delivered an underperforming system in the first part of the project (see paragraphs 39 to 41).

(f) Working relations between some member countries and the Commission were initially poor. Until the Commission created the Global Project Management Board in 2009, it did not manage to draw on the experience of all end-users (see paragraphs 21 to 25).

(g) It was not clear to all stakeholders who made key decisions (see paragraphs 26 to 28).

(h) The Commission increased the value of the main development contract from 20 million euro to 82 million euro through negotiated amendments. Whilst this procedure is provided for in the Financial Regulation, there is an inherent risk with any negotiated procedure that the prices paid are not competitive (see paragraphs 44 to 49).

71

After being made responsible for the project in 2001, the Commission's updated business case for SIS II did not include a thorough examination of all costs and expected benefits. During the project, there were major changes to the costs and expected benefits. The initial indicative estimates of the costs to the EU budget for the central system significantly underestimated the true scale of the investment necessary (see ***Figure 8***). Taking into account the national systems costs the overall costs amounted to some 500 million euro by the end of the project. Although SIS II provides new functions and greater capacity, the main benefit initially expected (connecting the increased number of member countries after enlargement) became less relevant because of the implementation of SISone4all in 2007. However, despite these changes, decisions to continue the project were taken without thoroughly reassessing the business case for SIS II in order to demonstrate that it remained an organisational priority which provided a higher return on investment than other opportunities (see paragraphs 50 to 63).

72

The Commission learnt lessons from its experience during the first part of the project in order to change its approach during the final project phase and to complete SIS II. In addition, although the Commission has not carried out a formal evaluation of the project, it has already applied some lessons from SIS II in preparing other large-scale IT projects (see paragraphs 64 to 69).

Recommendation 1

The Commission should base the project timetable for the development of large-scale IT systems on a technical analysis of the tasks to be performed, taking into account the risks and complexity of the project.

Recommendation 2

The Commission should include all large-scale IT projects under its responsibility in its corporate IT governance arrangements. There should be no distinction between IT projects funded from operational budgets and those funded from the administrative budget. The Commission should involve IT experts from DG Informatics or other directorates-general at the inception of large-scale IT projects. It should include a representative of DG Informatics in the project steering committee. When outsourcing development work, the Commission should ensure that it makes full use of in-house expertise to manage the contract and supervise the work of the development contractor effectively in order to minimise the risk of poor performance.

Recommendation 3

The Commission should ensure that those representing users of the system understand and take into account business needs and end-user requirements.

Recommendation 4

The project steering committee should approve the transition of a project through approval gates to the next key project phase. Before proceeding from project initiation to project planning, the project steering committee and the relevant Commission IT governance body should approve the business case.

The business case should include possible alternatives, a comprehensive cost-benefit analysis which identifies the full costs of the project and a resource plan which specifies the staffing needed on the user and IT sides.

The business case should be kept up to date and reapproved in the event of major changes to project costs, expected benefits, risks or alternatives.

Recommendation 5

The Commission should document key project decisions in a decision log so that they are easily traceable.

Recommendation 6

When a project requires the development of different but dependent systems by various stakeholders, the Commission should ensure that there is an effective overall project management to coordinate the whole project.

Recommendation 7

The Commission should ensure that contracts to develop large-scale IT systems contain prices for smaller, carefully defined work packages which can be used as the basis for adjusting the project without renegotiations. Furthermore, the Commission should develop large-scale IT systems using interlinked building blocks which can easily be reused, for example to pass completed work from one contractor to another. Although it requires an investment in design, this component-based software development approach minimises the impact of changes to requirements and is a means to benefit from advances in technology and avoid technical lock-in with contractors.

Recommendation 8

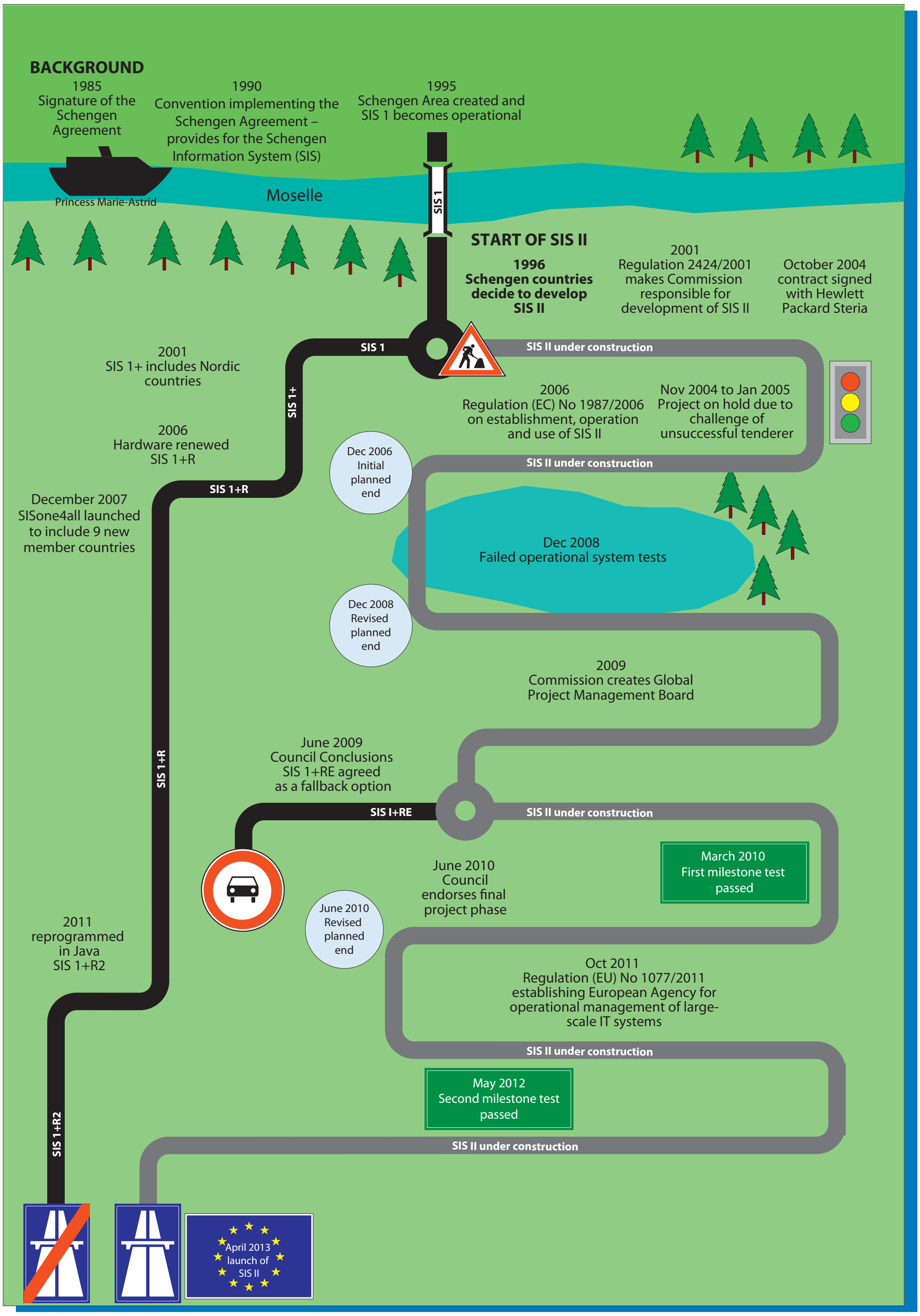
The Commission should pass on the lessons learnt from the Court's audit to directorates-general and EU institutions, agencies and other bodies. The Commission should evaluate whether the expected benefits of SIS II were achieved.

This report was adopted by Chamber IV, headed by Mr Louis GALEA, Member of the Court of Auditors, in Luxembourg at its meeting of 18 March 2014.

For the Court of Auditors

Vítor Manuel da SILVA CALDEIRA
President

Chronology of SIS II



Source: ECA.

Executive summary

II

The development of SIS II was started under a very particular legal and institutional framework applying at the time to this policy area. The Council took the decision to develop the SIS II on its own initiative and without a Commission proposal.

Many requirements were not foreseen from the start but were added only later. They were therefore not adequately estimated by the Council in fixing the target date or the budget.

III

The fact that SIS II was not delivered in line with the target date and budget estimate set in 2001 is in no doubt and has been known for some time. However the system that was delivered was very different from the one foreseen. The Commission considers that SIS II is performing adequately and fulfils the needs of the users.

IV

The Commission has fully reported on many occasions that the system would be delivered later and at a greater cost than initially planned and projected. It has also explained that the primary cause for this was the substantially changing system requirements.

IV (a)

The initial project deadline was set by the Council on the basis of its own analysis and without input from the Commission.

The Commission drew the attention of the Member States, in communications in 2001 and 2003, to the risks entailed with that deadline and the assumptions that would need to be met (and eventually were not) if the deadline was to be maintained.

IV (b)

The Commission presented a realistic project budget in 2010 once it had complete information, notably on the system requirements.

IV (c)

The fact that the system requirements were constantly evolving (mostly following MS requests) was a cause of the delays and the increase in costs. It also had a huge impact on the contract management aspect of the project, since this implied several revisions of the contract, which in turn did not facilitate the relationship with the contractor who was constantly faced with changing requirements.

IV (d)

The lack of staff was experienced in the whole policy area which was growing very rapidly.

IV (f)

The working relations between the Commission and some Member States was strained at times during the initial phase of the SIS II project. However DG Home Affairs, on the basis of the same contract and with the same contractors, delivered another large-scale IT system (VIS) in a constructive and harmonious working atmosphere with Member States, and with no ambiguities/challenges towards the decision-making process. The same can be said of the development of Eurodac.

The relationship with the SIS Community was less easy for a number of reasons such as a legacy system, a complex governance structure, policy considerations related to the overall approach of some member countries towards the enlargement of the Schengen area.

The governance structure was complex, reflecting both legislative requirements and evolving stakeholder´s needs.

IV (g)
Throughout the SIS II project, the Commission fully followed the Financial Regulation rules and negotiated in the best interest of the Union budget.

V
The initial business case had been analysed in the Council without a formal role of the Commission. During the life of the project, the project became subject to co-decision and the co-legislators confirmed that SIS II continued to be an absolute priority, notwithstanding the problems encountered.

The Commission systematically reassessed cost estimates at key milestones of the project when justified by new elements and always transparently communicated on budgetary matters, as spelled out under paragraph (70)(b).

There was no requirement on the Commission to estimate or track national expenditures for SIS II.

VI
The Commission confirms that it indeed has drawn and applied several key lessons from the development of this system. Nevertheless, it has to be recognised that the development of SIS II and its implementation are a very specific undertaking difficult to replicate to other IT systems.

VII
Most of the Court's recommendations reflect the Commission IT governance arrangements in place since 2010.

VII (h)
The Commission can accept this recommendation. The lessons learnt from the Court's audit will be shared with the other directorates-general at both technical and management levels, as well as disseminated to the relevant agencies, including eu-LISA, through the appropriate networks.

The impact of SIS II will be assessed in 2016 (3 years after SIS II entered operation), as required by the legal base (Article 50 paragraphs 4 and 5 of Regulation (EC) No 1987/2006 and Article 66 paragraphs 4 and 5 of Decision 2007/533/JHA).

Introduction

01
The initial Schengen Information System (SIS 1) was developed as an intergovernmental project led by France and became operational in 1995 (also significantly later than initially planned). It remained in operation, managed by France, until May 2013, when it was replaced by SISII. Although both the architecture and functionalities of the systems differ substantially.

The Commission considers that the comparison between the original deadline and the actual delivery date should take account of the large difference between the nature of the system initially planned and the one that was delivered.

02
A year after SIS 1 began operations, the Schengen countries decided in December 1996 to start work on defining the elements and requirements of an SIS II. The Council took its decision to build SIS II on the basis of a feasibility study conducted in 1998 and a series of consultations among Member States culminating with the Swedish/Belgian initiative that was the basis for the first SIS II legal basis.

The Member States worked within an intergovernmental framework and the Commission was not involved.

Once the Commission was entrusted with the development of SIS II, it launched a feasibility study to assess the business needs to be served by the new system, the technical choices and their impact, the timeline of the project and its budget, as well as the risks and constraints associated with the development. This feasibility study was carried out by a consultancy company in 2003. On this basis, the Council opted for one of the proposed implementation options (but not the one recommended by the feasibility study) in order to go ahead with the project.

03
While it is true that the primary reasons for developing SISII were the need to connect the new Schengen member countries and benefit from latest technological developments, important political events, like the September 2001 attacks, changed the scope of the projects and the final system is largely different than the one envisaged initially.

Audit scope and approach

05
The reasons for delays and spending more than initially planned as well as the difficulties encountered with the project have been reported by the Commission including in each Annual Activity Report of DG Justice, Freedom and Security and subsequently Home Affairs since 2001.

Observations

09
The Council took its decision to build SIS II on the basis of a feasibility study conducted in 1998 and a series of consultations among Member States culminating with the Swedish/Belgian initiative that was the basis for the first SIS II legal basis. The Council's decision fixed the launch date of end 2006. The Commission had no formal role in the legislative process.

Apart from reporting in each AAR since 2001 on the advancement and the main difficulties of the project, the Commission drew the attention of the Member States, in communications in 2001 and in 2003, to the risks entailed with that deadline and the assumptions that would need to be met (and eventually were not) if the deadline was to be maintained.

Both the 2001 communication (COM(2001) 720) and then, in full detail, the subsequent feasibility study carried out by an external contractor, carefully assessed the business needs to be served by the new system, the technical choices and their impact, the timeline of the project and its budget, as well as the risks and constraints associated with its development.

On this basis, the Council opted for one of the proposed implementation options (but not the one recommended by the feasibility study) in order to go ahead with the project in 2003.

The SIS II legal framework was not finalised until late 2006.

10
The initial deadline set by the Council was indeed not realistic given that it was established primarily on the basis of political considerations, rather than on a stable set of system requirements and a sound technical analysis of the workload.

11
Each SIS II schedule was based on the best available information at the time and was previously discussed with the Member States.

Following the adoption of the legal basis, the only parameter of the specifications that was subject to evolutions was the system's sizing, which is linked to the Member States' use of the system. This risk, which has been assessed throughout the project in the light of SIS1+ usage by the new Member States, indeed materialised due to a more intensive use than initially expected. However, even if the SIS II had been delivered according to the initial schedule adopted by the Council in 2001, the system would have required an upgrade of its sizing of the same magnitude as the one implemented in the framework of the project's extension carried out in 2010 (see figure 7) (final delta).

14
As of 16 December 2002, a new unit 'Large-scale information system' was created within DG Justice, Freedom and Security to exploit synergies between the major IT projects in the Justice and Home Affairs policy areas: SIS II, Eurodac and VIS (Visa Information System).

15
The Commission agrees that insufficient staffing was provided to the project in the early years and that SIS II project staff were committed and competent, though constantly overloaded. Successive annual activity reports from DG Justice, Freedom and Security pointed to the general lack of staff faced in general by the DG and in particular on SISII.

However, the Commission does not consider that the turnover level differed from that in comparable Commission services. In fact, key actors such as the Programme Officer remained in place from the beginning to the end.

16
As regards the expertise in the team, the Commission would recall that the SIS II team's expertise was mainly composed of staff either originating from Member States' former SIS1 projects or persons who had worked for IT companies prior to joining the Commission. The same expertise was available in the VIS project. Directorates-general Informatics, Information Society, and Enterprise and Industry also provided DG Home Affairs with some support, notably during the first years of the project. In addition a dedicated contract with Unisys had been signed since a very early stage of the project (April 2002) to compensate for the lack of internal resources in the field of quality management.

The Commission maintains that the contract was managed effectively. As an example, from the beginning, the Commission used the weekly contractor's meeting to voice its disappointment with the quality of deliverables and require corrective actions. Already in October 2005, the Commission did require (and obtained) a change of the contractor's project manager. However, as noted in the evidence to the House of Lords referred to in footnote 22 the staffing level meant that it could not anticipate and prevent the underperformance of the contractor. As noted in footnote 21, the IAS found there were insufficient staff to manage the increasing level of outsourcing

17
The contract suspension of a few months was the consequence of a tenderer making use of his right to challenge the award decision in the Court of Justice. The evaluation of the tenders was done according to the published criteria and method, which were known and accepted by all tenderers choosing to apply.

The conclusions of the President of the Court of Justice were done in an injunction procedure in which the Court of Justice, by definition, does not take a definite position until after a full adversarial procedure, but has to take a preliminary position in order to issue an injunction and must do so without a full hearing on the substance. Conclusions are thus only of relevance to the injunction procedure but do not allow one to deduce a final position of the Court of Justice; and in no way prejudge a final ruling. The evaluation method was thus never tested in the Court of Justice as the applicant withdrew his application.

The evaluation of the tenders was done according to the published criteria and method.

There is no evidence that the computation of a weighted average (or not) for the scores of the fixed-price items would have given a different result. From a methodological point of view, there is no perfect solution for taking decisions on the basis of multi-criteria choices.

The Commission would like to firmly state the fact that it received two good offers which were very close; a decision was taken respecting the rules. Other rules might have led to another decision, but the Commission was bound to the chosen rules.

19

The operational system tests in 2008 (which failed) was only one phase of SIS II system testing. The structure of the SIS II system tests was conceived to allow for the progressive increase of their level of complexity. With such a testing approach it is inherently possible to identify at a given phase issues that had not been discovered before (because of the mere nature of the tests performed so far) . The whole purpose is to make use of the different phases to identify (ideally all) potential problems before the system goes into production. This was the case in 2008, as well as during the final phase of the project after 2009 (as the testing approach remained unchanged throughout the project).

The additional posts received as from 2007 enabled the project team to recruit more staff with relevant experience.

22

The Commission notes that the SISVIS Committee also dealt with the VIS which reduced the time available to discuss SIS II. This was frustrating for SIS II experts. In fact, most of the issues that should normally have been discussed in the SISVIS committee were in fact discussed in the Council's SIS-TECH working party which had responsibility for SIS 1 issues. Many technical issues linked to SIS II could possibly impact on SIS 1, which is why many Member States insisted that they would also be discussed in SIS-TECH.

23
The environment in which the SIS II project was developed was less easy than the environment which DG Taxation and Customs Union experienced. This was for a number of reasons, such as the fact that SIS II was based on a legacy system, had a complex governance structure and because of policy considerations related to the overall approach of some member countries towards the enlargement of the Schengen zone and ever-changing system requirements.

Box 2
The prevailing contexts for the development of NCTS and SIS II substantially differed in terms of political and institutional challenges. Furthermore, the development of NCTS took place in an environment based on a long tradition of cooperation with Member States (which started in the early 1990s). Trust among all partners involved was supported by long-established networks.

24 (a)
The Commission accepts that it did not allocate sufficient staff to the project in the early stage. This was disclosed very clearly in the Annual Activity Report of the Directorate-General.

The Commission confirms that it was not an end-user of the system, nor was it an end-user of VIS and Eurodac. Accordingly it had to rely on Member States' input to be provided by Member States' delegates in the National Project Managers' meetings and the ad hoc working groups as well as by states experts who were national experts seconded by Member States to the Commission.

24 (c)
The Commission encouraged and organised direct contact between the main development contractor and Member States but, as is recommended by IT project methodology and best practice, such contact/interaction had to be placed in a framework. The contractors were present in the Committee and the National Project Managers' meetings, which were held at least once a month. There was also a formal cycle of revision for documents, allowing national experts to assess the technical specifications that were then formally submitted to the SISVIS Committee for endorsement.

As regards the disclosure of the contract, one member of the HP/S consortium opposed the disclosure of the contract.

24 (d)
The Council decided that SIS II was necessary in 2001 and maintained this position in successive Council conclusions, describing the implementation of SIS II consistently as 'absolute priority'.

25 (a)
Following the suspension of the Operational Systems Test in 2008 because of a series of issues with the central system, the Commission put in place a global SIS II programme management approach from January 2009. This was done in order to ensure the necessary consistency between the development of the central system and the national systems. (COM(2009)133). It included an informal body consisting of a limited number (eight) of Member States experts designated as the 'Global Programme Management Board' which was established to enhance cooperation and to provide direct Member States support to the central SIS II project. The global approach was welcomed by the Council conclusions on SIS II of 26–27 February 2009.

25 (b)

The increased staffing which the Commission allocated to the project after 2007 enabled it to improve the management of the project and its communication.

26

The Commission fully supports the Centre for European Policy Studies (CEPS) findings concerning the complex governance structure for the SIS II. Indeed CEPS states that '…..*Even after endowing the European Commission with the competence to manage the SIS II project, and following the expansion of the co-decision procedure which further strengthened the legislative roles of the Commission and European Parliament, (certain) Member States were not ready to relinquish control of a tool so central to security and migration management. Strategies to retain ownership of the project emerged, including the proliferation of expert groups, and the SIS1+RE proposal for an "intergovernmental" alternative to SIS II.*'

28

The Commission can only regret that a large share of respondents to the survey were ignorant of the decision-making structure which the Member States had agreed.

29

The Commission considers that the fact that system requirements were constantly evolving (mostly following Member States requests) was the primary cause of the delays and the increase in costs. It also had a major impact on contract management aspects of the project, since this implied several revisions of the contract, which in turn did not facilitate the relationship with the contractor who was constantly faced with changing requirements. It also increased the workload for the Commission in managing the contracts.

30

The Commission agrees that subsequent changes to the system requirements necessitated amendments to the development contract, which contributed to delays. The time taken to agree on the system requirements and to adopt the corresponding legal instruments was outside its control.

32

The resizing of the system's capacity was not due to the delays but, on the contrary, it actually contributed to them. It arose mainly because of the higher number of transactions submitted by Member States than initially forecast by them (thereby indirectly demonstrating the added value of the SIS). This seven-fold capacity increase (i.e. the current system's capacity can be expanded to 100 million records) necessarily also had an impact on the deadline and the costs. Again, it demonstrates that the instability of the system requirements was the primary cause of the delays and increased costs.

34

The Commission considers that the cost evolution should be placed in context. Each estimate was based on a changed set of requirements: The requirements and size of SIS II significantly changed in the course of the project, mostly following Member States/end users' requests :

- SIS II was originally assumed to go live with a maximum of 15 million records and was extended to have a capacity of 70 (with a further possibility of extension to 100 million records, as needed);
- The test approach was revisited and included a compliance test for each Member State system;

- The additional 'Milestone 1' and 'Milestone 2' tests imposed by the Council had to be added to the existing test plan, leading to a longer duration and additional tasks resulting in more expenses;
- The new migration approach after 2010 requested by the Council included a fallback solution that required a converter able to, not only to convert SIS 1 data to SIS II, but also do so in the reverse direction — again leading to additional costs.

36

The Commission always sought to present a clear picture of the costs on the basis of the information available. This was notably done in the context of the Annual Budgetary Procedure as well as in each SIS II progress report. The Court gives the example of the network: moving, at the request of Member States, to a dedicated network infrastructure based on a virtual private network (VPN) on s-TESTA rather than using the already existing infrastructure on s-TESTA (euro domain) as initially envisaged indeed had a very significant impact on the budget. Using the euro domain as initially foreseen by the Commission and as it is done for Eurodac would have cost much less. It was only in 2005, once the final design of the network was known that the Commission was in a position to revaluate the network costs, which it duly did in COM(2005)236. Nevertheless, the network costs were disclosed every year in the draft budget proposed to the budgetary authority.

40

The amount of liquidated damages imposed on the contractor was calculated following a thorough evaluation of the contractual situation by both the legal service of the Commission and an external law firm: At that point in time, this amount was the maximum legally possible.

41

Before 2009, the programme and project management structure from the main development contractor had, on several occasions, failed to meet contractual commitments. The Commission did not hesitate to request several changes to the main contractor's project management composition.

42

The Commission agrees that changes to the system requirements resulted in increased costs. It also resulted in delays.

43

The Court's example illustrates the impact of the instability of the system requirements.

44

The bulk of the cost increases entailed by these (amendments 12, 13, 15) corresponded to the major changes in the project's requirements, namely: the size and capacity of the SIS II, performance, migration approach, testing approach and supporting services to Member States during testing, or the support to be given for the operational management of the system. The Commission considers that the work package approach proposed can only work when all requirements are known from the beginning. Because of the instability of the system requirements, this was not the case here. A work package approach would not have prevented an increase of the costs linked to a different network design or to new capacity requirements.

Common reply to paragraphs 45 and 46

Already at the time of the first contract amendment the Commission had identified the technical reasons (i.e. a technical lock-in situation with the winner of the initial contract) as a ground for the amendment of the contract by means of a negotiated procedure. However, for the first amendment, the two options provided for in the Financial Regulation, (the 'additional services max 50% option' and the 'technical lock-in option') were equally justified and relevant. In that context, the Commission chose to apply the first option for the first amendments. It is only when the second option remained the only one possible that the Commission opted for it.

47

The Commission considers that while a 'building blocks' approach is preferable where it can be applied and notably where the system requirements are stable, this was not the case for SIS II. In addition, SIS II is a highly complex, bespoke system that includes the migration of a legacy system. A 'building block' approach would have led to significant problems for handovers and ultimately a liability problem when a contractor for one building block could have avoided liability by blaming technical problems on the presumed shortcomings of other building blocks. The choice was therefore deliberately made (and in full transparency since the call for tender was also reviewed by Member State experts) to not use a building block approach. In addition, one must note that at the time the project started the RUP methodology was not in place at the Commission.

48

The contractor underperformed for certain phases of the contract, for which it paid penalties according to the contract.

49

The Commission considers that the negotiations of amendment 15 were conducted in line with best practice for negotiated procedures.

Whether prices initially proposed by the contractor were twice as high or not, is not relevant. What is relevant is the final price level obtained after negotiations, and the legal guarantee of best customer prices in case any divergences would have appeared during implementation/delivery. The fact that the Commission verified the prices of a sample of items against those used by DG Informatics in their framework contracts is a further guarantee that the best possible price was obtained in the procedure.

The Commission reiterates that it believes that the solution used was indeed financially sound.

53

As the Court notes, given that SIS II was an IT project developed for the Member States and not for the Commission, it did not fall within the remit of the Commission IT governance scheme put in place after 2004. Notwithstanding this, DG Informatics participated systematically in the monthly meetings of the Project Management Board (PMB) until the end of 2008 with only one interruption between May and October 2008. Furthermore, information was provided annually to DG Informatics about the development of SIS II in the framework of the 'Schema Directeur' exercise.

54

After being made responsible for the project, the Commission had to start the development of SIS II on the basis of a business case prepared by the Council, which did not include a thorough assessment of all costs, expected benefits and alternatives.

54 (a)
The SIS II legal instruments state that the Member States are responsible for the development of the national systems. Two groups were created by the Council in the course of the project in order to monitor and report on national developments (which also include costs): the SIS II Task Force and Friends of SIS II. The Commission was a member of these two groups and consistently sought to obtain information about national projects, but without success.

The 2003 communication spelled out the basis for the distribution of costs for developing the SIS II were distributed between the Union and the Member States. It also spelled out the budget for developing the central systems but did not estimate the costs of developing national systems since such developments were outside its mandate. The Commission had no control over, or information about these costs (except where they were co-financed from the External Borders Fund).

54 (b)
The Commission does not agree that it should have presented new analysis of the benefits of the project once the Council had taken its decision. At the time, the Council, had exclusive competence in the adoption of the initial legal basis for SIS II.

54 (c)
The Council itself had ruled out the possibility of an extension of SIS 1 in its decision of 6 December 2001 on the development of the second generation Schengen Information System (SIS II) (2001/886/JHA). The Commission had no formal role in this legislative process.

56
As regards the funding of national developments, the Commission made significant efforts in 2011 to mitigate the risk of delay due to lack of financial resources for Member States by inviting national authorities to give higher priority to SIS II under their existing External Borders Fund (EBF) national allocations and via the organisation of a call for proposals for emergency actions under the Community actions of the EBF under which an extra €7.5 million is being provided to the eight Member States most in need of additional resources (countries with very low EBF allocations and/or whose EBF resources were absorbed by other key priorities in the area of external borders). These projects started at the end of 2011.

57
Member States reported that SIS II has brought significant benefits in terms of performance and capacity.

The Commission confirms that the risk of reputational damage in case of a failure of the development became more important towards the end of the project, as indicated by the reservations issued in DG Home Affairs Annual Activity Reports from 2008 to 2012. This reflects sound financial management considerations (not wasting investments already made).

58
Like the large majority of respondents, the Commission also considers that SIS II had significant additional functions which provided end-users with immediate visible practical advantages over SIS 1.

59
The Commission deems that, compared to the previous system, SIS II has brought significant functional and non-functional benefits to the users.

For instance, due to a much richer content (such as photographs, copies of European Arrest Warrants …), the size of a SIS II alert is significantly higher on average than that under SIS1. Such alerts are however broadcast without any loss of performance. SIS 1 was not built to handle such alerts.

Finally, SIS II provides the possibility to handle a high volume of direct queries on the central database (240 queries per second) while SIS 1 had no such functionality. There are five Member States that exclusively rely on this functionality for all of their SIS II transactions.

60
The magnitude of the issues faced by the SIS II project became clear only at the stage of the failed OST test (end 2008), when the central system started interacting with a subset of national systems. The Commission made a reservation on SIS II in the DG Home Affairs 2008 Annual Activity Report and announced an action plan.

In an approach jointly agreed by all stakeholders, the Commission, together with the Member States and assisted by the GPMB, revisited the sizing specifications, implemented technical changes aimed at improving the robustness and reliability of the system as well as implemented changes in the way that the SIS II would be tested and the migration itself conducted.

At the end of this process which indeed required time but was done as quickly as possible, the Commission adopted a new, realistic schedule endorsed by all stakeholders and finalised the development of the SIS II project according to this schedule.

61
The Council reaffirmed in February 2009 that the rapid entry into force of SIS II remained an absolute priority. (cf. footnote 63)

In June 2009, on the basis of a detailed Report of the Presidency and the Commission on the future direction of SIS II containing an analysis of the impact of two scenarios on, among other things, expenditure for the EU budget, technical feasibility and risks, Council decided to continue development of SIS II.

62
As the Commission explained in SEC(2010) 436 final, developing SIS II on the basis of SIS 1 + RE solution was likely to have a significant impact on the national projects. These costs could only be estimated by Member States for each individual project and were therefore not part of the comparison report.

63
The Commission would like to point out that the inclusion of two milestone tests, as requested by the Council in its June 2009 Conclusions, increased both the duration and the costs of the project.

66
The Commission has drawn the lessons from the SIS II project in its 2010 Communication (COM(2010)385 page 27) and in the proposal to establish an agency dedicated to the management and development of large-scale IT systems in the policy area (COM(2010)93).

67
The Commission would stress that when SIS II project was launched the PM2 or similar methodology did not exist.

68 (a)
The Treaty revision means that any new legislation on the development of large-scale IT projects would be decided between the Council and the Parliament on the basis of a Commission proposal. This was not the case in 2001.

69 (a)
The Commission's 2011 proposals for the multiannual framework 2014–20 (COM(2011) 749, p. 8) provides for the financing of the development and operation of the central and national systems.

Conclusions and recommendations

70 (a)
The Commission drew the attention of the Member States, in both communications from 2001 and 2003, to the risks entailed with that deadline and the assumptions that would need to be met (and eventually were not) if the deadline was to be maintained.

70 (b)
The Commission systematically reassessed cost estimates at key milestones of the project when justified by new elements and it communicated transparently on budgetary matters:

- in 2005 when network costs were re-evaluated (COM(2005)236);
- in May 2009 in the Commission/Presidency joint Report on the further direction of SIS II (Council document 10005/09);
- in April 2010 in the Report on the global schedule and budget for the entry into operation of the second generation Schengen Information System (SIS II) (SEC(2010) 436);
- in September 2010 in the Report on the global schedule and budget for the entry into operation of the second generation Schengen Information System (SIS II) (SEC(2010)1138).

Furthermore, each progress report since 2003 contained a section on budget execution.

70 (c)
The fact that the system requirements were constantly evolving (mostly following MS requests) was a cause of the delays and the increase in costs. It also had a huge impact on the contract management aspect of the project, since this implied several revisions of the contract, which in turn did not facilitate the relationship with the contractor who was constantly faced with changing requirements.

70 (d)
The lack of staff was generalised to the whole policy area which was growing very rapidly.

70 (f)
The same DG Home Affairs unit that worked on the SIS II project, on the basis of the same contract and with the same contractors, delivered another large-scale IT system (VIS) in a constructive and harmonious working atmosphere with Member States, and with no ambiguities/challenges towards the decision-making process. The same can be said of the development of EURODAC.

There were underlying reasons for the poor relationship with the SIS Community (e.g. a legacy system, a complex governance structure, unrealistic political steering of the project, etc.).

70 (g)

The Commission can only regret the overall poor recognition by many stakeholders of the decision-making arrangement surrounding the SIS II project.

The complex governance structure generated difficulties for the management of the project.

70 (h)

Throughout the SIS II project, the Commission fully followed the Financial Regulation rules and negotiated in the best interest of the Union budget.

71

The Commission recalls that the Member States built up the business case and carried out the necessary preparatory assessments within an intergovernmental framework The Council took its decision to build SIS II on the basis of a feasibility study conducted in 1998 and a series of consultations among Member States culminating with the Swedish/Belgian initiative that was the basis for the first SIS II legal basis.

The Commission had no competence to legally challenge or review such legislation emanating from the Council. The sole Commission obligation was to implement the Council's decision. It should also be recalled that the Council reaffirmed on multiple occasions that the entry into operation of SIS II was an absolute priority.

Once the Commission was entrusted with the development of SIS II, it launched a feasibility study to assess the business needs to be served by the new system, the technical choices and their impact, the timeline of the project and its budget, as well as the risks and constraints associated with the development.

The Commission is not able to confirm the €500 million figure quoted by the Court. National costs being outside the development's perimeter funded centrally by the EU budget, there was no reason to include them in the financial statements attached to the legislative proposal. There was no requirement on the Commission to estimate or track national expenditures for SIS II.

The Commission systematically reassessed cost estimates at key milestones of the project when justified by new elements and always transparently communicated on budgetary matters, as spelled out under paragraph (70)(b).

72

The Commission confirms that it indeed has drawn several key lessons from the development of large-scale IT systems, and has already implemented them, notably in the design of the Smart Borders package. However, this project must be regarded as '*sui generis*' for the reasons set out in earlier paragraphs.

Recommendation 1

The Commission can accept this recommendation which reflects its IT governance arrangements in place since 2010. More precisely, during the analysis of IT projects by the Information Systems Project Management Board (ISPMB, created in end 2010) such considerations are carefully examined. The directorate-general in charge of IT (DG Informatics) is also consulted at the level of the impact assessment phase when a new Commission initiative contains an IT component.

Recommendation 2

The Commission can accept this recommendation which reflects its IT governance arrangements in place since 2010. The IT rationalisation process, launched in the Commission in 2010, already includes all IT projects managed by the Commission, irrespective of the source of their funding. The Communication SEC(2011) 1500 recalls that *'in addition to the Infrastructure Consolidation project (ITIC), which will be rolled out to all services,* ***all information systems*** *of the Commission, including offices and executive agencies, financed under both* ***operational and administrative budgets*** *are subject to the rationalisation process'*.

As far as large-scale IT projects belonging to the Commission are concerned, the governance mechanisms put in place since 2010 ensure their close scrutiny not only by DG Informatics but also by the 'Information Systems Projects Management Board' (ISPMB), of which not only the other horizontal DGs, but also five DGs representing different types of policies, are members. More precisely, the 'tran-seuropean systems' domain (see also answer to recommendation 6) is supervised by the High level Committee on IT.

Recommendation 3

The Commission can accept this recommendation which reflects its IT governance arrangements in place since 2010. Before the start of a project, directorates-general are obliged, under the IT governance rules put in place in 2010, to submit a business case or a vision document to the Information Systems Project Management Board (ISPMB) that spells out, amongst other things, how the governance structure of the project is set up. The Board pays particular attention to the proper representation of the users in the project governance. Moreover, all projects need to report yearly to the Board, thereby ensuring a close follow-up of the work carried out and of possible deviations from the initial scope, timetable, and budgets.

Recommendation 4

The Commission can accept this recommendation which reflects its IT governance arrangements in place since 2010. The Commission follows the PM2 project management methodology and project artefacts already provide entries for alternatives, cost estimations, resources, etc. All projects with a total cost of ownership above 500K (over 5 years) needs to submit a business case/ vision document to the ISPMB and to report on an annual basis.

Recommendation 5

The Commission can accept this recommendation which reflects its IT governance arrangements in place since 2010. Indeed, the PM2 project artefacts already include four types of logs that can be used by project managers: risk log, issue log, decision log and change log. Moreover, the documents of each project (business case, vision document, progress reports …) are accessible through a central system, called GOVIS.

Recommendation 6

The Commission can accept this recommendation which reflects its IT governance arrangements in place since 2010. This is reflected in the 'domain' approach that has been followed in the IT rationalisation exercise since 2010. Systems have been grouped according to business domains (e.g. 'grant management', 'financial management', 'procurement', etc.). There are currently 19 domains, each led by a domain leader, who is responsible for the convergence and the rationalisation in his/ her domain. New systems need to have the green light of the domain leader before being developed, thereby ensuring their compliance with the domain strategy and their coherence with the existing systems.

Recommendation 7

The Commission can accept this recommendation which reflects its IT governance arrangements in place since 2010. The Commission services are now working on the definition of a Corporate Enterprise Architecture, based on a coherent set of reusable building blocks. Several such building blocks have already been identified and, once available, their use is compulsory for new systems or systems undergoing major revisions. Missing but necessary building blocks are currently being identified. DG Informatics has recently set up an Architecture Office. The ISA programme and, more recently, the Connecting Europe Facility (CEF) initiative are also recommending an increased use of cross-cutting common services to cover generic needs (e.g. secure transmissions, e-signatures, semantics tools)

Recommendation 8

The Commission can accept this recommendation. The lessons learnt from the Court's audit will be shared with the other directorates-general at both technical and management levels, as well as disseminated to the relevant agencies through the appropriate networks.

The impact of SIS II will be assessed in 2016 (3 years after SIS II entered operation), as required by the legal base (Article 50 paragraphs 4 and 5 of Regulation (EC) No 1987/2006 and Article 66 paragraphs 4 and 5 of Decision 2007/533/JHA).

HOW TO OBTAIN EU PUBLICATIONS

Free publications:

- one copy:
  via EU Bookshop (http://bookshop.europa.eu);
- more than one copy or posters/maps:
  from the European Union's representations (http://ec.europa.eu/represent_en.htm);
  from the delegations in non-EU countries (http://eeas.europa.eu/delegations/index_en.htm);
  by contacting the Europe Direct service (http://europa.eu/europedirect/index_en.htm) or
  calling 00 800 6 7 8 9 10 11 (freephone number from anywhere in the EU) (*).

  (*) The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

Priced publications:

- via EU Bookshop (http://bookshop.europa.eu).

Priced subscriptions:

- via one of the sales agents of the Publications Office of the European Union
  (http://publications.europa.eu/others/agents/index_en.htm).nts/index_en.htm).

QJ-AB-14-003-EN-C
ISSN 1831-0834

The Schengen Information System contains information on people and property which is used by border guards and police throughout the Schengen Area. In this report the Court of Auditors examines the Commission's management of the project to develop a new, second generation Schengen Information System (SIS II). It explains why the system was delivered 6 years later than planned and at 8 times the initial budget estimate.

CURIA RATIONUM
EUROPEAN COURT OF AUDITORS

ISBN 978-92-9241-934-9
9 789292 419349
Publications Office