



Annual report
[Translation from the Swedish original]

Financial year 2014

The Annual Report can also be found on SHK's website: www.havkom.se

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1. FOCUS OF OPERATIONS

1.1 Tasks

The Swedish Accident Investigation Authority (Statens haverikommission, SHK) has been tasked with investigating serious accidents and incidents in air traffic, at sea, in rail traffic, in road traffic and in other operations, all from a safety perspective. “Other operations” means all other operations in society besides air traffic, maritime operations, rail traffic or road traffic. SHK's investigative tasks cover both civilian and military operations. SHK also cooperates with the various safety authorities in their accident prevention work, as well as with the investigative bodies of other countries and certain international bodies working in the field, such as the European Aviation Safety Agency (EASA), the European Maritime Safety Agency (EMSA) and the European Railway Agency (ERA).

The purpose of SHK's investigations is to

- clarify, as far as possible, the sequence of events and their causes, as well as damages and other consequences,
- provide the basis for decisions aiming at preventing similar events from occurring again, or limiting the effects of such events, and
- provide a basis for an assessment of the operations performed by the public emergency services in connection with the event and, if there is a need for them, improvements to the emergency services.

The sole purpose of SHK's operations is to improve safety. The authority has no inspection remit, nor is it any part of its task to deal with issues of blame, liability, damages or matters of certification, disciplinary measures, etc. This means that such matters are neither investigated nor discussed in connection with an investigation.

1.2 Provisions which regulate SHK's operations

SHK's operations are primarily regulated by the Accident Investigation Act (1990:712) (LUO), the Accident Investigation Ordinance (1990:717) (FUO), the Ordinance (2007:860) with instructions for SHK, as well as Regulation (EU) No 996/2010 of the European Parliament and of the Council on the investigation and prevention of accidents and incidents in civil aviation, and Commission Regulation (EU) No. 1286/2011 on adopting a common methodology for investigating marine casualties and incidents.

Also of great importance to the investigations are Directive 2009/18/EC of the European Parliament and of the Council establishing the fundamental principles governing the investigation of accidents in the maritime transport sector (the Marine Accident Investigation Directive), and Directive 2004/49/EC of the European Parliament and of the Council on safety on the Community's railways

(the Railway Safety Directive), as are Annex 13 of the Chicago Convention¹ and the IMO Code².

2. RESULTS

2.1 Requirements of the appropriation letter

2.1.1 Goals

The investigations of accidents and incidents carried out by SHK shall be concluded as soon as possible, and preferably within twelve months of the accident or incident.

2.1.2 Reporting requirements

The number of occurrence reports received and closed and the number of investigations launched and concluded shall be reported, by category.

SHK shall report and comment on the handling time for investigations over the past three years. SHK shall also analyse and explain the most common causes for the handling time for certain accident investigations exceeding twelve months. In addition, SHK shall report on the measures taken to reduce handling times.

2.2 OPERATIONAL DEVELOPMENT

2.2.1 Overall assessment

SHK makes the overall assessment that the authority has fulfilled the goals of its operations to a great extent, albeit not entirely. SHK's cooperation with the concerned safety authorities is generally going well and continues to develop.

Although the proportion of investigations that were concluded within twelve months has decreased since 2013, this is due to the concerted effort made to deal with old investigations. When a large number of old investigations are concluded, this naturally has a negative effect on this part of the statistics.

On the other hand, at the end of 2014, the proportion of ongoing investigations that were older than 12 months was only 13 per cent, and no investigation was older than 20 months. This is a considerable improvement indicating that efforts to reduce the backlogs have been successful at the same time as the number of incoming occurrence reports, commenced investigations and published final reports have all increased.

¹ The Convention of 7 December 1944 on International Civil Aviation, whose Annex 13 contains International Standards and Recommended Practices for the investigation of accidents and incidents in civil aviation.

² The International Maritime Organisation (IMO) Code of International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code).

The operations are almost entirely event-driven. New accidents and incidents call for quick handling initially, partly in order to make a correct assessment of whether or not they should be investigated and partly to ensure no investigation material is lost. This in turn means that, repeatedly, investigations already underway must be set aside.

The events reported to SHK also vary greatly from time to time and from one area of investigation to another. The criteria that make an occurrence mandatory to investigate also vary from one area of investigation to the next. This means that the number of initiated investigations has historically been larger in the field of aviation (low threshold for an investigation to be considered mandatory) than in other areas (high threshold). On the other hand, the investigations that do have to be carried out in these other areas are on average more complex, extensive and time-consuming. In addition, the number of commenced investigations in civil maritime operations has now increased significantly.

Furthermore, in civil maritime operations, it is a statutory requirement for a formalised preliminary assessment to be carried out with respect to certain categories of incidents, even if these do not ultimately result in an investigation. An assessment of this nature not infrequently requires an initial investigation directly at the scene of the event, which in turn means a disruption to the work with other ongoing investigations.

Overall, this means that handling times are very difficult to predict. In some cases, primarily where international collaboration is involved, they can also be difficult – if at all possible – for SHK to influence. It is therefore far from always “possible” to conclude an investigation within twelve months of the event. Of course, this does not alter the fact that the authority is obliged to constantly strive towards that goal. SHK's assessment is also that the efforts that have been made in this respect – efforts which are still underway and will continue to be so – have brought SHK gradually closer to the goal.

Measures to improve the planning and follow-up of the investigative work have been implemented. A goal has now been set in the overall work plan; that the vast majority of SHK's investigations shall be concluded within twelve months and that no investigation shall take longer than 20 months. All ongoing investigations are reviewed monthly by management in order to uncover bottlenecks and facilitate the implementation of prioritisation measures. An in-depth tertiary follow-up procedure with the same purpose has also been introduced. Both on a departmental level and for each investigation, systems for more meticulous planning and follow-up have been introduced. An electronic support system for file handling was also launched on 1 January 2014. In addition, the work to introduce a comprehensive operations management system continues and is expected to be fully implemented before the end of the year 2015.

The number of occurrence reports received in civil maritime operations that must be assessed increased in 2014 and is now the highest in many years. The number of events in civil maritime operations that must be investigated has also increased, first in 2013 and now further in 2014. As mentioned, these investigations are also more complicated and more extensive on average than their counterparts in civil aviation. Staffing in maritime operations has been a problem that has led to delayed investigations and backlogs. However, new recruitments in the area have created significantly better conditions for the investigative work. This has also become apparent, among other things, through the number of published final reports in the maritime area being the same in 2014 as for the preceding six years combined.

At the same time, there is no escaping the fact that the authority needs additional budgetary funds for human resources in order to sustainably achieve the goal of shorter handling times also in the maritime area, and so that the preparedness to handle major accidents which the authority is required to have, can be maintained. SHK intends to return to this matter in the budget application for 2016-2018.

2.2.2 *Structure of the Results section*

General

“New cases” are all accidents and incidents reported to SHK over the year. “Concluded cases” are all cases concerning accidents and incidents which SHK has closed over the year. “Initiated investigations” are the cases that SHK has decided to investigate over the year, and “issued final reports” are investigations concluded over the course of the year for which final reports have been published.

SHK's reporting of operations is divided into: civil aviation, civil maritime operations, rail traffic, military operations and other operations.

SHK has chosen to fulfil its reporting duty by reporting statistics from each area for the past three years, and then to comment on these statistics and on other factors which are of interest to the achievement of the goal.

Statistics on the total number of cases received and concluded, plus the opening and closing balance (backlog), are presented for each area, as well as the number of cases in which the decision was made to launch an investigation or to carry out a formal preliminary assessment (applicable in the field of maritime operations only), the number of final reports and the extent to which the likely cause of the accident could be established, the number and proportion of final reports produced within twelve months and the average and median handling times in months. Furthermore, there are statistics for the number of ongoing investigations at the end of the year, the proportion of these that had at that time exceeded 12 and 20 months respectively

as well as average and median handling times in months. Finally, a report is given of SHK's assessment of the responses to its recommendations to e.g. supervisory authorities received over the year.

Incidents

In this context, it should be pointed out that incidents are not reported separately from accidents. The reason for this is primarily that it is often purely down to chance whether an event has had such consequences as would lead it to be classified as an accident or as an incident in accordance with the law. In many cases involving minor accidents, there are often circumstances which mean that the event can also be considered a near-miss in terms of a larger, serious accident.

Handling of recommendations

Safety recommendations are reported in terms of the number of recommendations issued over the year, how many were deemed by SHK as having been implemented and how many not, including an opening and closing balance (backlog). A recommendation is considered to have been implemented if its purpose has been fulfilled, even if the addressee has chosen another way to implement it than what SHK has proposed. If a recommendation is not considered implemented, this means the recipient has taken a final stance on the matter and decided not to take any measures in response to the recommendation, or at least not any measures that SHK considers suitable, or that the recipient has not submitted an account within the prescribed time and SHK has come to the conclusion that there is no purpose in allowing the case to be left open.

2.2.3 Investigation of accidents and incidents

Civil aviation

For the area of civil aviation, investigations which in accordance with Annex 13 of the Chicago Convention are carried out by accident investigation authorities in other countries – but where SHK is entitled to and shall exercise their power to appoint an “accredited representative” – are reported separately. The possibility for SHK to influence the handling time for these investigations is almost non-existent, and the cases are concluded only once a final report is issued by the accident authority of the other country. Therefore, no statistics are given with respect to the handling times of these investigations. Safety recommendations issued by the foreign investigative body are followed up by that authority and not by SHK, for which reason statistics on the handling of recommendations are also not presented for these cases.

To a varying degree, however, these investigations also require work contributions from SHK. In this way, they also have a negative impact on SHK's own investigations in terms of handling times and the total number of investigations carried out.

Table 1. Total no. of cases.

Year	2012	2013 ³	2014
Opening balance	22	44	36⁴
New cases	135	168	150
Concluded cases	138	177	155
Closing balance	19	35	31

Table 2. Investigations initiated by SHK, by aviation category and type of aircraft.

Category	2012	2013	2014
Commercial aviation	8	4	7
Private aviation	8	12	9
Civil state aviation	-	-	1
Total	16	16	17
<i>Of which type of aircraft</i>			
Large aircraft ⁵	5	2	5
Multi engine light aircraft	-	1	
Single engine light aircraft	4	8	2
Seaplane	1	0	2
Helicopters	2	3	4
Gliders	3	1	4
Hot air balloons	1	1	-
Other	-	-	-

³ The opening balance for 2013 also includes foreign aviation cases which SHK is assisting in but which have not previously been reported among the total number of reported cases, and which were therefore not included in the closing balance for 2012.

⁴ One international case, L-122/13, is missing from the closing balance for 2013.

⁵ Large aircraft are aircraft with a maximum permissible mass exceeding 5,700 kg.

Table 3. Final reports issued by SHK, by aviation category and type of aircraft.

Category	2012	2013	2014
Commercial aviation	13	7	9
Private aviation	8	12	10
Civil state aviation	-	-	-
Total	21	19	19
<i>Of which type of aircraft</i>			
Large aircraft	13	6	4
Multi engine light aircraft	-	-	1
Single engine light aircraft	2	6	7
Seaplane	1	1	1
Helicopters	4	2	6
Gliders	-	3	-
Hot air balloons	1	1	-
Other	-	-	-
Likely cause of accident established	20	19	19

Table 4. Number and proportion of SHK's investigations concluded within 12 months and average and median investigation times in months.

	2012	2013	2014
Total number of issued reports	21	19	19
Of which concluded within 12 months	12	17	14
Percentage of which concluded within 12 months	57	89	74
Average investigation time	14.4	9.1	12.9
Median investigation time	11.6	9.7	11.2

Table 5. The number of ongoing investigations at the end of the year, the proportion of these that had at that time exceeded 12 and 20 months respectively as well as average and median investigation times in months.

	2012	2013	2014
The number of ongoing investigations at the end of the year	17	14	12
Proportion that had at that time exceeded 12 months, in %	18	21	0
Proportion that had at that time exceeded 20 months, in %	6	14	0
Average investigation time at the end of the year	8.1	9.4	5.7
Median investigation time at the end of the year	6.4	5.6	5.7

Table 6. Recommendations.

Year	2012	2013	2014
Opening balance	17	29 ⁶	19
Issued	28	13	13
Implemented	16	23 ⁷	9
Not implemented	2	0	7
Closing balance	27	19	16

The number of *occurrence reports received* has decreased somewhat in relation to 2013 but is greater when compared with 2012. In terms of *commenced investigations*, these have increased marginally compared with both 2013 and 2012. The backlog of aviation cases has decreased since the previous year.

The average *handling time* for investigations concluded in 2014 was just under 13 months, which is a deterioration in relation to 2013 but an improvement when compared with 2012. The median time has also increased somewhat when compared with 2013 but is shorter than for 2012. The explanation for the deterioration of the average handling time is, as mentioned in the introduction, the concerted effort made to deal with old investigations. For aviation operations, three of these had a handling time upon conclusion of 20, 30 and 40 months respectively, which considerably affected the average value.

The closing *balance* of ongoing investigations in the field of aviation at the end of 2014, included none that had a handling time exceeding twelve months by the end of the year. This is a considerable

⁶ Two recommendations are missing from the closing balance for 2012.

⁷ Of which four have been deemed partially implemented.

improvement compared with both 2013 and 2012 when 21 and 18 per cent respectively were older than 12 months.

Over the year, 19 *final reports* have been issued, which is on the same level as 2013, but a marginal decrease compared with 2012.

Likely *causes* of the accidents and incidents have been established in all cases, which was the same as in 2013. In 2012 there was one case in which the likely cause could not be established.

Of the final reports issued over the year, 74 per cent were produced within a period *shorter than twelve months*. This is a deterioration compared with 2013 but an improvement compared with 2012. The five investigations for which the investigation time exceeded twelve months are commented below.

RL 2014:02 concerns an accident involving a helicopter at the Aitik mine, Norrbotten county. The investigation time was 30 months. The main reason for the long handling time is the major changes made to the investigation team in the course of the investigation.

RL 2014:07 concerns a serious incident involving an aircraft in scheduled passenger traffic at Sveg Airport. The investigation time was 13 months. The investigation was relatively complicated from both an operational and a technical perspective. This resulted in the longer handling time.

RL 2014:09 concerns an accident involving a helicopter in Porjus, Norrbotten county. The investigation time was 20 months. Here too there was a negative impact on the handling time due to changes made to the investigation team in the course of the investigation.

RL 2014:13 concerns a serious incident at Tving, Ronneby control zone. The investigation time was 40 months. There is no explanation for this other than the fact that older investigations have been given greater priority.

RL 2014:14 concerns an accident involving a helicopter in Lake Tyresö-Flaten, Stockholm county. The investigation time was just over 12 months. There is no explanation for this other than the fact that older investigations have been given greater priority.

In 2014, 13 new *recommendations* were issued whilst 16 responses were assessed by SHK. The closing balance of 16 recommendations consists of cases in which either the time to respond to recommendations has not yet expired or the responses have not yet been finally assessed by SHK. Among the recommendation responses assessed by SHK during 2014, nine have been considered implemented. Seven recommendations have been considered not implemented. Below follows an account of the *recommendations which have been considered not implemented*.

RL 2013:03 concerns a serious incident (problems with pressurisation) during a scheduled flight with a Boeing B737 from Stockholm/Arlanda Airport to Skellefteå. The aircraft type has two separate systems for pressurisation of the cabin, both of which were functioning at take-off. One of the systems, however, developed problems during the flight and was therefore shut off. Later during the flight, problems also developed with the remaining system. The crew declared an emergency, oxygen masks were put on in the cockpit and the aircraft reduced its altitude at a rapid rate of descent. The aircraft could then land without further problems.

If it is discovered before a flight that a pressurisation system is inoperative, it is still permitted to fly, though with a limitation in terms of flight altitude. SHK issued a recommendation (RL 2013:03 R1) that such a limitation should also be considered if a pressurisation system becomes inoperative *during a flight* and therefore recommended the United States Federal Aviation Administration (FAA) and the European Aviation Safety Agency (EASA) to promote such a change. However, neither the FAA nor EASA found reason to do so.

RL 2012:14 concerns an accident involving an aircraft of the type Cessna U206E that was used to drop parachutists. Due to the engine being run on a fuel/air mixture richer than what was prescribed, lead bromide accumulated in the engine's oil pan. The oil supply was stopped, upon which the engine lost thrust. The parachutists left the aircraft, the pilot performed an emergency landing on a field, and the aircraft nosed over.

SHK issued one recommendation (RL 2012:14 R1) to the FAA and two to EASA (RL 2012:14 R2 and R3), all of which aimed to change the maintenance programme for the aircraft type to enable internal inspections of the oil pan in connection with oil changes. However, the FAA and EASA did not consider there to be reason to change the maintenance programme.

RL 2014:09 concerns a helicopter of the type Bell 206B, whose main rotor separated from the helicopter after landing. Due to a contaminant in the oil system, the oil supply to the free wheel mechanism was stopped, which resulted in the free wheel not functioning as intended and the mast was sheared off.

SHK issued two recommendations (RL 2014:09 R3 and R4) to the Canadian aviation authority (Transport Canada) to promote a reduction in the oil system's sensitivity to contaminants and for operators of the helicopter type to be provided with information and suggestions for preventive measures. Transport Canada has responded that it does not intend to take any measures.

Table 7. Foreign aviation investigations in which SHK has been participating.

Year	2012	2013	2014
Opening balance	15	25	21⁸
New cases	12	10	9
Concluded cases	2	15	11
Closing balance	25	20	19

Over the year, SHK has had either an accredited representative or an expert in accordance with Annex 13 of the Chicago Convention appointed to nine new investigations abroad. In 2013, SHK was engaged in ten such investigations and in 2012 the corresponding figure was twelve. In 2014, eleven such cases could be concluded. The closing balance is thereby on a level equivalent to that in 2013.

Civil maritime operations

Where civil maritime operations are concerned, all investigations in which SHK has decided to delegate the task of leading the investigation to the investigative body of another state, in accordance with Section 8 d of the Accident Investigation Ordinance (1990:717), are dealt with separately. These decisions are motivated by the requirement in the same provision for each accident or incident at sea to be subject to only one investigation carried out by an EU Member State. According to the Marine Accident Investigation Directive, concerned Member States shall therefore agree on who shall lead an investigation of this nature.

However, unlike international aviation investigations, these investigations are also formally SHK's responsibility, which is why handling times for these are also accounted for below. Any recommendations in such cases are however followed up by the foreign investigative body and not by SHK, for which reason the handling of recommendations issued in these investigations is not included in this report.

Table 1. Total no. of cases.

Year	2012	2013	2014
Opening balance	6	10	21
New cases	204	171	222
Concluded cases	200	160	224
Closing balance	10	21	19

⁸ One international case, L-122/13, is missing from the closing balance for 2013.

Table 2. Preliminary assessments, initiated investigations and issued final reports – investigations led by SHK.

Year	2012	2013	2014
Preliminary assessments	15	23	22
Initiated investigations	4	6	10
Issued final reports	0	1	11
Likely cause of accident established	–	1	11

Table 3. Number and proportion of investigations concluded within 12 months and average and median investigation time in months – investigations led by SHK.

	2012	2013	2014
Total number of issued reports	0	1	11
Of which concluded within 12 months	–	0	2
Percentage of which concluded within 12 months	–	0	18
Average investigation time	–	16.3	20.4
Median investigation time	–	16.3	16.9

Table 4. The number of ongoing investigations at the end of the year, the proportion of these that had at that time exceeded 12 and 20 months respectively as well as average and median investigation times in months – Investigations led by SHK.

	2012	2013	2014
The number of ongoing investigations at the end of the year	7	12	11
Proportion that had at that time exceeded 12 months, in %	53	50	18
Proportion that had at that time exceeded 20 months, in %	0	25	0
Average investigation time at the end of the year	9.2	12.9	6.6
Median investigation time at the end of the year	10.5	9.84	6.3

Table 5. Recommendations – Investigations led by SHK.

Year	2012	2013	2014
Opening balance	4	0	8
Issued	0	8	33
Implemented	4	0	16 ⁹
Not implemented	0	0	2
Closing balance	0	8	23

The number of *occurrence reports received* has increased when compared with figures for both 2013 and 2012 and is now the highest in many years. In terms of *initiated investigations*, these have increased significantly compared with 2013 and 2012 and also in relation to the years before that. Despite this, the backlog of maritime cases has decreased since the previous year, while eleven investigations have been concluded during the year, which is a very great increase compared with previous figures. Over the year, 22 *preliminary assessments* have been made by SHK, which is one less than in 2013.

The *average handling time* for investigations concluded in 2014 was just over 20 months, which is a deterioration in relation to 2013. Also the median time has increased somewhat compared with 2013. However, it is important to stress that only one case was concluded in the area of maritime operations in 2013 and none at all in 2012. The explanation for the long handling times is, as mentioned in the introduction, the concerted effort made to deal with the oldest investigations. Now that many of these have been concluded during the year, this naturally has a negative effect on this part of the statistics.

Although the average handling time has thus increased, it is clear that the resources dedicated to the investigation of maritime cases have had a considerable effect. The closing *balance* of still ongoing investigations in the field of maritime operations at the end of 2014, included 18 per cent that had a handling time exceeding twelve months by the end of the year. This is a considerable improvement compared with both 2013 and 2012 when 53 and 50 per cent respectively were older than 12 months. At the end of 2013, 25 per cent of the then ongoing cases were older than 20 months. At the end of 2014, there was no investigation that had been ongoing for that length of time.

Over the year, 11 *final reports* have been issued, which is thus a considerable improvement compared with the previous year.

Likely *causes* of the accidents and incidents have been established in all cases, which was the same as in 2013.

⁹ Of which one has been deemed partially implemented and one has been withdrawn by SHK.

Of the final reports issued over the year, 18 per cent were produced within a period shorter than twelve months, which is an improvement compared with 2013. The fact that nine of the now concluded investigations exceeded an investigation time of twelve months is attributable to delayed investigations and backlogs, mainly due to sick leave, an unforeseen turnover of investigative staff and a considerable increase in the number of occurrence reports and initiated investigations in maritime operations. Another explanation is that the implementation of the Marine Accident Investigation Directive (2009/18/EC) has proven to entail an additional workload in the handling of each individual maritime case that was more extensive than calculated before the new Union legislation entered into force. However, new recruitments and replacements in the area of maritime operations have created significantly better conditions for the future investigative work. Nevertheless, additional human resources may need to be added within the field of maritime investigation. As mentioned, SHK will return to this matter in the budget application for 2016–2018.

In 2013, 33 new *recommendations* were issued whilst 18 responses to recommendations were assessed by SHK. The closing balance of 23 recommendations consists of cases in which either the time to respond to recommendations has not yet expired or the responses have not yet been finally assessed by SHK. Among the recommendation responses assessed by SHK in 2014, 14 have been considered implemented and 1 partially implemented. One recommendation has been withdrawn. Two recommendations have been considered not implemented. Below follows an account of the recommendation which has been considered partially implemented and the two recommendations which have been considered not implemented.

RS 2013:01 concerns the cargo vessel PHANTOM which was loaded with sawn timber in Oskarshamn. Outside Öland, the cargo shifted and the vessel heeled heavily but could be towed to quay. SHK issued several recommendations in its final report, one of which (RS 2013:01 R6) was directed to the Swedish Transport Agency and to the effect that the conditions for introducing regulations requiring vessel inspections both before and after the loading of timber should be investigated.

The Swedish Transport Agency stated in its response that increased supervisory measures in the form of inspections would be disproportionately costly, but that campaigns or risk-based supervisory measures could be considered in areas where compliance is perceived as deficient. SHK noted that this may well be a means of achieving the intended effect, but that the Swedish Transport Agency has not provided any further details on whether, or in what way, it intends to actually take any such supervisory measures. The recommendation was therefore considered to be only partially implemented.

RS 2014:05 concerns the cargo vessel TRANS AGILA which ran aground in Kalmarsund. SHK issued a recommendation (RS 2014:05 R2) to the classification society concerned to review its procedures in order to avoid the approval of hull and machinery work even where this has not been carried out in accordance with the regulations. Furthermore, SHK issued a recommendation (RS 2014:05 R3) to the shipping company to take measures to ensure that its vessels implement the shipping company's Safety Management System (SMS) in their daily work in accordance with the intentions of the system. Neither the classification society nor the shipping company has responded to the recommendations.

Table 6. Preliminary assessments, initiated investigations and issued final reports – Investigations led by another state.

Year	2012	2013	2014
Preliminary assessments	0	1	1
Initiated investigations	0	5	2
Issued final reports	1	0	4
Likely cause of accident established	1	–	4

Table 7. Number and proportion of investigations concluded within 12 months and average and median investigation time in months – Investigations led by another state.

	2012	2013	2014
Total number of issued reports	1	0	4
Of which concluded within 12 months	0	–	3
Percentage of which concluded within 12 months	0	–	75
Average investigation time	35	–	14.5
Median investigation time	35	–	7.8

Over the year, one *preliminary assessment* has been conducted and two *investigations initiated* in which the investigative bodies of other countries are responsible for leading the investigation and in which SHK is assisting. In one case, it was a question of a Swedish passenger vessel that collided with a pier abroad. Following an agreement with SHK, the foreign investigative authority conducted a preliminary assessment and subsequently an investigation of the event. The second case concerned the investigation of a marine casualty abroad involving a foreign vessel, in which one Swedish passenger was killed.

In maritime investigations that are led by the investigative body of another country following this type of agreement, SHK often has a

delimited task to handle in the investigation. Just how much work must be carried out does however tend to vary greatly. Beyond SHK's own contributions in such investigations, SHK has very limited, if any, power to influence the investigation work and thereby also the handling time for these investigations.

Over the year, four *final reports* have been issued for investigations led by foreign bodies and in which SHK has assisted.

Rail traffic

Table 1. Total no. of cases.

Year	2012	2013	2014
Opening balance	9	8	5
New cases	79	56	59
Concluded cases	80	59	60
Closing balance	8	5	4

Table 2. Initiated investigations and issued final reports.

Year	2012	2013	2014
Initiated investigations	5	1	4
Issued final reports	5	4	5
Likely cause of accident established	5	4	4 ¹⁰

Table 3. Number and proportion of investigations concluded within 12 months and average and median investigation times in months.

	2012	2013	2014
Total number of issued reports	5	4	5
Of which concluded within 12 months	1	0	0
Percentage of which concluded within 12 months	20	0	0
Average investigation time	21.4	20.1	21.6
Median investigation time	23.3	17.9	20.3

¹⁰ One of the concluded investigations relates to a thematic investigation, *Safety in rail work*, for which it is not a question of determining the cause of accident.

Table 4. The number of ongoing investigations at the end of the year, the proportion of these that had at that time exceeded 12 and 20 months respectively as well as average and median investigation times in months.

	2012	2013	2014
The number of ongoing investigations at the end of the year	8	5	4
Proportion that had at that time exceeded 12 months, in %	38	80	0
Proportion that had at that time exceeded 20 months, in %	0	20	0
Average investigation time at the end of the year	10.2	16.4	5.1
Median investigation time at the end of the year	10.89	15.4	5.5

Table 5. Recommendations.

Year	2012	2013	2014
Opening balance	3	6	1
Issued	10	10	15
Implemented	4	13 ¹¹	10
Not implemented	3	2	0
Closing balance	6	1	6

The number of *occurrence reports received* has increased somewhat in 2014 compared with 2013, but is less than in 2012. The number of *initiated investigations* has increased compared with 2013 and is back at almost the same level as in 2012.

Over the year, *final reports* were published for five cases, which represent a slight increase when compared with 2013 but is on the same level as 2012.

None of the five investigations closed over the year could be finalised in less than twelve months. Both the average handling time and the median handling time increased somewhat compared with 2013. Compared with 2012, the average handling time was at about the same level, while the median handling time has improved.

There are no specific factors in the individual investigations which explain the longer investigation times. The explanation is rather to be found primarily in general factors. Historically, there has been a relatively large staff turnover among rail investigators, but the situation has now stabilised. Furthermore, it may be noted that

¹¹ Of which one has been deemed partially implemented.

investigations in the rail traffic area are typically more extensive than many of the cases on e.g. the aviation side of operations.

In terms of *closing balance*, however, a significant improvement can be seen. None of the ongoing investigations at the end of the year were older than 12 months. The corresponding figure for 2013 was 80 per cent and for 2012 38 per cent. The future conditions for also concluding investigations in the rail traffic area in under 12 months may therefore be assessed as good.

Over the year, 15 *recommendations* have been issued. The closing balance of 6 recommendations consists of cases in which either the time to respond to recommendations has not yet expired or the responses have not yet been finally assessed by SHK. SHK has assessed ten responses to recommendations. All have been considered implemented.

Military operations

Table 1. Total no. of cases.

Year	2012	2013	2014
Opening balance	3	2	1
New cases	14	18	18
Concluded cases	15	19	16
Closing balance	2	1	3

Table 2. Initiated investigations and issued final reports.

Year	2012	2013	2014
Initiated investigations	1	1	3
Issued final reports	2	2	1
Likely cause of accident established	1	1	1

Table 3. Number and proportion of investigations concluded within 12 months and average and median investigation times in months.

	2012	2013	2014
Total number of issued reports	2	2	1
Of which concluded within 12 months	0	0	1
Percentage of which concluded within 12 months	0	0	100
Average investigation time	28.2	29.1	6.0
Median investigation time	28.2	29.1	6.0

Table 4. The number of ongoing investigations at the end of the year, the proportion of these that had at that time exceeded 12 and 20 months respectively as well as average and median investigation times in months.

	2012	2013	2014
The number of ongoing investigations at the end of the year	2	1	3
Proportion that had at that time exceeded 12 months, in %	50	0	33
Proportion that had at that time exceeded 20 months, in %	50	0	0
Average investigation time at the end of the year	22.1	2.7	9.0
Median investigation time at the end of the year	22.1	2.7	9.4

Table 5. Recommendations.

Year	2012	2013	2014
Opening balance	6	15	37
Issued	9	22	0
Implemented	0	0	37¹²
Not implemented	0	0	0
Closing balance	15	37	0

The number of *occurrence reports received* is on the same level as in 2013, which represents an increase compared with 2012. The number of *initiated investigations* has increased when compared with both 2013 and 2012.

One *final report* has been issued. The handling time was six months. This represents an improvement compared with 2013 and 2012. The *closing balance* at the end of the year had decreased somewhat compared with 2013 and 2012. At the end of the year, the average and median handling times for at that time ongoing cases were nine and just over nine months respectively. This is an increase compared with 2013 but a considerable improvement compared with 2012.

No *recommendations* have been issued over the year. No recommendations remained unassessed at the end of the year. SHK has assessed 37 responses to recommendations. Of these, 34 have been considered implemented, while three have been considered partially implemented. Below follows an account of the recommendations which have been considered only partially implemented.

¹² Of which three have been deemed partially implemented.

RM 2013:02 concerns the accident of 15 March 2012 involving an aircraft of type C 130J 30 Super Hercules from the Royal Norwegian Air Force at Kebnekaise. The report recommended the Royal Norwegian Air Force to ensure that procedures are used that prevent aircraft from being flown below the minimum safe altitude or flight level en route in IFR flight (RM 2013:02 R1).

The response from the Royal Norwegian Air Force stated, inter alia, that the personnel concerned have been informed of the cause of the accident and of the responsibility for terrain separation in IFR flight in all types of airspace. In addition, its Regulations for Military Aviation (BML) had been revised with regard to the Commander's responsibility for terrain separation. However, it was not possible to draw any firm conclusions from the response as to whether this entailed any change in actual procedure.

In connection with another recommendation, however, the Royal Norwegian Air Force has stated that deviations have been identified with regard to planning and preparations for flights and that work is in progress to resolve this. In addition, another investigation was reported to be in progress on the possible existence of disparities concerning flight operational practices between crews and how this affects the risks. That investigation aims to provide a basis for taking measures to reduce any undesirable disparities.

SHK made the assessment that this work ought to be able to contribute to achieving what SHK's recommendation had in view. However, what was stated in the recommendation response from the Royal Norwegian Air Force was assessed to be too brief to draw any firm conclusion about this matter. SHK therefore deemed the recommendation to be only partially implemented.

The same report also recommended that the Swedish Transport Agency ensure that air traffic controllers possess sufficient expertise and aids to manage situations that do not frequently occur, among other things (RM 2013:02 R7). This recommendation should be viewed in light of the fact that one of the final report's conclusions was that the air traffic controllers had not had the necessary knowledge, experience and aids to manage infrequently occurring air traffic from the west in a safe manner.

With reference to its certification of training organisations, approval of local training plans, competency assurance programmes and conducted supervision, the Swedish Transport Agency's response was that the recommendation would have been implemented as soon as supervision checklists had been updated. However, the response did not state the manner in which these would be updated, nor did it given any recount of what was missing. Based on the response, it was therefore not possible to make a sufficiently certain assessment of whether the recommendation may be considered implemented. SHK therefore considered it to be only partially implemented. The Swedish

Transport Agency has subsequently submitted a supplementary response. SHK has not yet taken a position on whether this response calls for any further assessment.

RM 2011:01 concerns a serious incident during the parachute dropping of materiel from a transport aircraft of type TP84 Hercules. The load was dropped outside the intended drop area. SHK issued six recommendations to the Swedish Armed Forces. Five of the recommendations were considered to be implemented.

The sixth recommendation (RM 2011:01 R6) stated that the Swedish Armed Forces should as soon as possible create a regime, which would ensure on the one hand that recommendations that the Armed Forces report to SHK as being implemented, or as subject to planned measures, are indeed carried out, and on the other hand that where implementation later proves not to be possible, information to this effect is submitted to SHK as soon as possible.

The Swedish Armed Forces responded that a process for the handling of SHK's recommendations was under development. SHK assessed, however, that there were still shortcomings in the Swedish Armed Forces' systems for the follow-up and reporting of measures implemented in response to recommendations from SHK. However, this had been considered to be balanced to some extent by the dialogue held at liaison meetings of the Swedish Armed Forces' Safety Inspectorate and Military Flight Safety Inspectorate. The recommendation was therefore considered to be partially implemented.

Other operations

Table 1. Total no. of cases.

Year	2012	2013	2014
Opening balance	1	3	1
New cases	13	11	12
Concluded cases	11	13	11
Closing balance	3	1	2

Table 2. Initiated investigations and issued final reports.

Year	2012	2013	2014
Initiated investigations	2	1	1
Issued final reports	0	3	0
Likely cause of accident established	–	3	–

Table 3. Number and proportion of investigations concluded within 12 months and average and median investigation times in months.

	2012	2013	2014
Total number of issued reports	0	3	0
Of which concluded within 12 months	–	1	–
Percentage of which concluded within 12 months	–	33	–
Average investigation time	–	22.6	–
Median investigation time	–	18.8	–

Table 4. The number of ongoing investigations at the end of the year, the proportion of these that had at that time exceeded 12 and 20 months respectively, and average and median investigation times in months.

	2012	2013	2014
The number of ongoing investigations at the end of the year	3	1	2
Proportion that had at that time exceeded 12 months, in %	33	0	50
Proportion that had at that time exceeded 20 months, in %	33	0	0
Average investigation time at the end of the year	13.4	4.1	8.5
Median investigation time at the end of the year	10.6	4.1	8.5

Table 5. Recommendations.

Year	2012	2013	2014
Opening balance	0	0	11
Issued	0	15	0
Implemented	–	4 ¹³	5¹⁴
Not implemented	–	0	6
Closing balance	0	11	0

The number of *occurrence reports received* is on about the same level as in 2013 and 2012. *One new investigation* has been initiated; this concerns a bus accident on road 27 outside Tranemo on 4 December 2014 in which two persons were killed and several persons were seriously injured.

No *final report* was published in 2014, which is a decrease compared with 2013, but on the same level as in 2012. The *closing balance* at the end of the year was on a par with previous years. Of the two investigations that were ongoing at the end of 2014, one was older than 12 months (but has since been concluded and published), compared with 2013 when there was no investigation older than 12 months.

In 2014, no new *recommendations* have been issued. No recommendations remained unassessed at the end of the year. Eleven responses to recommendations have been assessed. Of these, four have been considered implemented, one only partially implemented and six not implemented. The seven latter responses are commented below.

RO 2013:02 concerned a death at Karolinska University Hospital's Cardiology Unit in Solna. The final report issued five recommendations (R1-R5) to the Health and Social Care Inspectorate (IVO). IVO's response to the recommendations was brief and general in nature. In its response, IVO stated that “the current wording of SHK's recommendations allows no scope to evaluate these recommendations relative to other risks”.

In assessing the response to the recommendation, SHK noted that it is of course a delicate task to prioritise how supervision should be carried out, based on available resources. Naturally, SHK does not have the comprehensive picture of the supervisory activities necessary to set such priorities. It goes without saying that it is for IVO to evaluate the risk areas identified by SHK and prioritize in relation to other risk areas. However, as far as can be assessed from IVO's statement, no such evaluation has taken place.

¹³ Of which one has been deemed partially implemented.

¹⁴ Of which one has been deemed partially implemented.

SHK furthermore noted that three of the five recommendations had not been commented at all by IVO and that it was not possible to draw any further conclusions from the response to the other recommendations on how IVO intended to implement them. In summary, there was no explicit position from IVO regarding each individual recommendation issued and the risk conditions that the recommendations aimed to eliminate. Against this background, SHK assessed that none of the recommendations could be considered implemented.

The same final report also issued recommendations to the Swedish Medical Products Agency and the Swedish Work Environment Authority (R6 and R7).

With regard to the Medical Products Agency's response to the recommendation, SHK assessed that it was difficult on the basis of the submitted response to determine whether a review such as the one SHK had recommended would actually take place. However, the recommendation could be considered partially implemented since the Medical Products Agency stated that the recommendation would be taken into account in the selection for the more in-depth supervision of medical devices and in the further development of the selection process for the Agency's supervision.

The Work Environment Authority stated that there were no resources to make general inspections at the hospitals' intensive care departments in the way SHK had recommended. SHK therefore assessed that the recommendation could not be considered implemented.

2.2.4 *Other safety work*

According to Section 1 of the Ordinance (2007:860) providing instructions for SHK, SHK shall cooperate with the concerned safety authorities in their efforts to prevent accidents.

In accordance with Section 6.2 of the Accident Investigation Ordinance (1990:717), the Swedish Transport Agency, the Swedish Armed Forces and the Swedish Civil Contingencies Agency (MSB) have a right to follow SHK's investigations. This allows them, where necessary, to take supervisory measures without delay. These authorities follow SHK's investigations by appointing an advisor in each investigation, who can then keep the respective authority informed of the progress of the investigation without being a part of the investigation team.

SHK also has regular meetings with these and other relevant authorities in order to discuss working routines of common interest, as well as specific recommendations issued in the investigations. At these meetings, changes in legislation are also discussed, as well as other current areas which are of interest from a safety perspective.

In addition to the contacts that go on continuously within the scope of the various accident investigations, in 2014 SHK has had one meeting with the Swedish Transport Agency's Road and Rail Department and two meetings each with the aviation and maritime sections of its Maritime and Aviation Department. SHK has also had two meetings with the Swedish Armed Forces' Safety Inspectorate, one of which dealt with the issue of military accidents abroad. Over the year, one meeting has been held with MSB and one meeting with the Swedish Maritime Administration (Sjöfartsverket). Among other things, the latter meeting discussed the conditions for the Joint Rescue and Coordination Centre's (JRCC) reporting of maritime accidents and incidents to SHK.

2.2.5 *Maintaining of staff competence*

Reporting requirements in accordance with Chapter 3, Section 3 of the Annual Reports and Budget Documentation Ordinance (2000:605)

The authority shall report on measures taken to ensure that competence is available to complete the tasks laid down in the authority's instructions and, where applicable, in the Government's appropriation letter to SHK or in other decisions. The report shall include an assessment of how the measures taken have contributed overall to the completion of these tasks.

Reporting

General

Section 4 of SHK's instructions clarifies which different types of expertise shall be represented among the authority's accident investigators. At least one accident investigator aside from the Director General shall be a lawyer with professional judge experience. There shall also be accident investigators with operational and technical expertise from the aviation, maritime and rail sectors, general technical expertise, expertise in the area of civil protection and rescue services, as well as expertise in behavioural sciences.

By the end of 2014, SHK had 33 employees; 10 female and 23 male. One employee was on leave of absence. The average age of the employees was 48. Over the year, four new employees were taken on and three persons left. Of the three who are no longer employed, one had a temporary position substituting for an employee on parental leave and the other two had permanent positions.

Apart from this, SHK contracts, in accordance with its instructions, external experts and specialists in different areas to assist the authority in its investigations.

Attracting and recruiting

Those applying for work at SHK should meet a recruitment process that is professional, efficient and transparent. Information on available

positions is disseminated via SHK's website, the Swedish Public Employment Service, daily press and various professional channels of communication.

When recruiting investigators, these are required to have several years of experience from the relevant area of expertise and good language skills. The applicants' expertise is tested via both theoretical and practical tests.

As mentioned above, SHK has taken on four persons in 2014. Two of these positions were new recruitments and two were replacements.

Experience from recruitments shows that the authority is perceived as an attractive workplace and that it is not difficult to recruit personnel.

SHK uses the services of contracted external experts in a number of areas. These experts are required to have a high level of expertise in their respective areas and the successful candidates must keep themselves up to date within their field of expertise and are responsible for their own professional development.

Developing

SHK's task places high demands on the experience and expertise of staff members. The mandatory requirements for candidates consist of theoretical knowledge and practical experience in their individual area of investigation. All newly employed investigators then begin with an introduction which, apart from internal rules and routines, includes training in advanced accident investigation, knowledge of public administration, safety at accident sites and other work environment issues. The accident investigators' training must be constantly updated, maintained and developed using various follow-up and refresher courses.

For training investigators in civil aviation, there are detailed recommendations issued by the International Civil Aviation Organisation (ICAO). An air accident investigator must have considerable experience from the field of aviation as a base for further training to become an accident investigator. Individual development plans corresponding to ICAO's *Training Guidelines* are available for all investigators in the field of aviation. These are followed up continuously and, where required, supplemented with additional training with the purpose of updating the investigators' knowledge in line with developments in the area. Training in advanced accident investigation with a focus on civil aviation takes place abroad as such courses are not available in Sweden.

Also within the field of maritime investigation, there are relatively clear demands on investigators' expertise and professional background. The International Maritime Organisation's (IMO) code on Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code) and EU Directive 2009/18/EC,

establishing the fundamental principles governing the investigation of accidents in the maritime transport sector, both refer to the part of IMO Res. A.996 (25) which concerns expertise criteria for marine accident investigators. In order to meet training requirements, SHK has performed a survey of the investigators' expertise and produced individual development plans which are supplemented when the need for new expertise is identified.

The rail traffic area has no similar expertise criteria at the international level, but SHK nevertheless has corresponding development plans for the authority's rail traffic investigators.

At least one personal development review per year is conducted with all employees, in which existing expertise is surveyed and individual expertise development needs are assessed.

The development and implementation of an integrated, process-based operations management system will encompass a review of the authority's professional development work in order for a comprehensive sub-process for professional development to be in place during the spring of 2015.

Over the year, the following training courses of a more general character have been carried out at SHK: training in PowerPoint, fire prevention, the on-call duty system, safety at the site of an accident for new employees, and training in health risks and personal protection at a crash site.

In the autumn, the department for civil aviation and military activities also underwent a theoretical exercise and a practical exercise in the management of a major accident in commercial aviation. The theoretical exercise was carried out together with the other Nordic accident investigation authorities in Stavanger. The exercise of a more practical character was an internally arranged exercise at an airfield outside Falköping.

Retaining

The staff turnover was 9.1 per cent in 2014, a reduction of 6.5 percentage points in comparison with the previous year when the staff turnover was 15.6 per cent.

SHK offers interesting and stimulating tasks of an advanced nature with good opportunities for professional development. The authority applies an individual pay structure for each employee, has a competitive wage level, flexible/non-regulated working hours and works actively with work environment as well as equal treatment and discrimination issues. The authority also offers its employees health examinations, one hour a week for physical exercise, subsidised massage and a yearly allowance to pay for the cost of such activities.

In order to provide all employees with the opportunity to follow developments within the authority, monthly information meetings are held for the entire staff. Departmental meetings, which are also an important source of information, are held regularly. In addition to this, all employees take part in a yearly two-day planning conference aiming at preparing next year's work plan.

Phasing out

The training period for a new investigator is long, and in order to ensure transferral of expertise, replacements should be recruited in good time prior to retirement. This makes them expensive. Two investigators in the area of civil aviation will reach retirement age in two years, and in order to avoid the risk that important expertise in this area will be lost, the work to recruit a replacement has already been started. One of SHK's investigators in the area of civil protection and rescue services will retire in summer 2015. SHK has decided to defer a possible replacement in this area until completion of the revision (SOU 2014:82) of, among other things, the provisions on the investigation of rescue services operations in the Accident Investigation Act (1990:712).

Overall assessment

SHK fulfils the competence requirements laid down in its instructions.

SHK considers the measures taken in the human resources area to have contributed to the authority's ability to fulfil its duties in accordance with its instructions.

Staff turnover has decreased considerably over the past two years; from 20.7 per cent in 2012 to 9.1 per cent in 2014. This has had a positive effect on investigation times as new recruitments require extensive training and a long introduction period before an investigator has the necessary expertise to perform the work independently.

Staffing has been a problem, primarily in the area of maritime investigation. It has led to delayed investigations and backlogs. However, new recruitments in the area in recent years have created better conditions for the investigative work. This has become apparent, among other things, through the number of published reports in the maritime area being, which was greater in 2014 than in the preceding six years combined.

Besides the lower staff turnover, SHK's strategy of increasing the number of investigators with permanent contracts rather than using contracted external consultants has contributed to an increase in efficiency in the form of shorter investigation times and reduced backlogs. This staff increase has been financed by a considerable decrease in the costs for consultants in recent years.

As mentioned above, the training period for a new investigator is long. Persons who both fulfil the high requirements in terms of experience and theoretical knowledge in their respective field of investigation and have prior experience from work as a qualified accident investigator are seldom found.

This means the authority is very vulnerable not only in the event of retirement in old age, which is of course predictable and yet still costly if a replacement is to work in parallel with the individual who is to leave so as to ensure that the expertise is transferred.

It also means that any other leave of absence, e.g. for studies, parental leave, due to illness or in order to gain experience in other areas, leads to a considerable setback in the investigative work. It is often the case that by the time a temporary replacement has trained to a level sufficient in order to take independent responsibility for an investigation, not much of the period of temporary employment remains. This in turns leads to hiccups in the planning and, not least, works against the ambition to shorten investigation times. Additional human resources are required in order to address this problem.

Even apart from this, more staff will be needed in order to ensure, among other things, that the current goal of shorter investigation times can be fulfilled. SHK intends to return to this matter in its budget application for 2016-2018.

2.2.6 *Efficiency and sound economic management*

The following presents five key performance indicators that SHK uses as a basis for the assessment of whether or not operations have been run efficiently and in a sound economic way:

1. The number and proportion of investigations concluded within twelve months and the average and median investigation times, as per each area of investigation.
2. The number of ongoing investigations at the end of the year, the proportion of these that had at that time exceeded 12 and 20 months respectively, as well as average and median handling times in months.
3. How the total number of working hours has been distributed between the different processes.
4. The number and proportion of full time employees (FTE) in administrative or other supporting functions in relation to the total number of FTE.
5. Costs for administrative support in relation to total operational costs.

SHK uses the statistics for the first two key performance indicators to verify whether or not the authority has succeeded in its ambition to increase the efficiency of its investigative operations so that the

investigation times go down over time in order to achieve the goal of a handling time of, if possible, less than twelve months.

Key performance indicator no. 1 – The number and proportion of investigations concluded within twelve months and the average and median investigation times, as per each area of operations.

Table 1. Number and proportion of investigations concluded within 12 months.

Area of investigation	2012			2013			2014		
	Number of reports	Of which concluded within 12 months	Percentage of which concluded within 12 months	Number of reports	Of which concluded within 12 months	Percentage of which concluded within 12 months	Number of reports	Of which concluded within 12 months	Percentage of which concluded within 12 months
Aviation	21	12	57	19	17	89	19	14	74
Maritime	0	–	–	1	0	0	11	2	18
Rail	5	1	20	4	0	0	5	0	0
Military	2	0	0	2	0	0	1	1	100
Other	0	–	–	3	1	33	–	–	–
Total	28	13	46	29	18	62	36	17	47

Table 2. Average and median handling times in months.

Area of investigation	2012			2013			2014		
	Number of reports	Average investigation time	Median investigation time	Number of reports	Average investigation time	Median investigation time	Number of reports	Average investigation time	Median investigation time
Aviation	21	14.4	11.6	19	9.1	9.7	19	12.9	11.2
Maritime	0	–	–	1	16.3	16.3	11	20.4	16.9
Rail	5	21.4	23.3	4	20.1	17.9	5	21.6	20.3
Military	2	28.2	28.2	2	29.1	29.1	1	6.0	6.0
Other	0	–	–	3	22.6	18.8	–	–	–
Total	28	16.6	13.3	29	13.6	11.7	36	16.2	13.0

Over the year, 36 final reports have been published, which is an increase of as many as seven reports in comparison with 2013. In 2012, SHK issued 28 reports.

In total, 17 investigations were concluded within twelve months in 2014, which is a marginal decrease compared with 2013, but an increase from 2012 when 13 investigations were concluded within twelve months.

The proportion of investigations concluded within twelve months has decreased from 62 per cent in 2013 to 47 per cent in 2014. In 2012, 46 per cent of investigations were concluded within twelve months. However, as mentioned, this apparent “deterioration” is due to the

concerted effort made to deal with old investigations. When a large number of old investigations have now been concluded, this naturally has a negative effect on this part of the statistics. As shown by Key performance indicator no. 2, efforts to reduce the backlogs have been successful at the same time as the numbers of occurrence reports, initiated investigations and published final reports have all increased.

The total average investigation time has increased from 13.6 months in 2013 to 16.2 months in 2014. In 2012, the average investigation time was 16.6 months. The median time has increased from 11.7 months in 2013 to 13.0 months in 2014. In 2012, the median time was 13.3 months.

The investigation times for concluded investigations per area of operations have been analysed and commented on in more detail in Section 2.2.3 above.

Key performance indicator no. 2 – The number of ongoing investigations at the end of the year, the proportion of these that had at that time exceeded 12 and 20 months respectively, and average and median investigation times in months.

Table 3. The proportion of ongoing investigations at the end of the year that had at that time exceeded 12 and 20 months respectively.

Area of investigation	2012			2013			2014		
	Number of investigations	Proportion > 12 months	Proportion > 20 months	Number of investigations	Proportion > 12 months	Proportion > 20 months	Number of investigations	Proportion > 12 months	Proportion > 20 months
Aviation	17	18	6	14	21	14	12	0	0
Maritime	7	43	0	12	50	25	11	18	0
Rail	8	38	0	5	80	20	4	0	0
Military	2	50	50	1	0	0	3	33	0
Other	3	33	33	1	0	0	2	50	0
Total	38	32	8	39	36	18	32	13	0

Table 4. Average and median investigation times in months.

Area of investigation	2012			2013			2014		
	Number of investigations	Average investigation time	Median investigation time	Number of investigations	Average investigation time	Median investigation time	Number of investigations	Average investigation time	Median investigation time
Aviation	17	8.1	6.4	14	9.4	5.6	12	5.7	5.7
Maritime	7	9.2	10.5	12	12.9	9.8	11	6.6	6.3
Rail	8	10.0	10.9	5	16.4	15.4	4	5.1	5.5
Military	2	22.1	22.1	1	2.7	2.7	3	9.0	9.4
Other	3	13.4	10.6	1	4.1	4.1	2	8.5	8.5
Total	38	10.1	9.4	39	10.9	7.0	32	6.6	5.8

By the end of the year, SHK had a total of 32 ongoing investigations, which is a decrease of seven investigations in comparison with 2013. In 2012, the number of ongoing investigations at the end of the year was 38.

The proportion of ongoing investigations at the end of the year that had at that time exceeded an investigation time of 12 months has decreased significantly in the comparison period. In 2012 and 2013, the proportion was 32 and 36 per cent respectively; in 2014, the proportion was only 13 per cent.

At the end of 2014, there were no ongoing investigations that had exceeded 20 months. At the end of 2012 and 2013, the proportion of investigations that had exceeded 20 months was 8 and 18 per cent respectively.

The average investigation time for ongoing investigations at the end of 2014 was 6.6 months. For 2012 and 2013, the average investigation time was 10.1 and 10.9 months.

The investigation times for ongoing investigations at the end of the year per area of operations have been analysed and commented on in Section 2.2.3 above.

Key performance indicator no. 3 – How the total number of working hours has been distributed between the different processes.

Below is a summary of how the total working hours for all employees, and respectively for investigators only, are distributed among SHK's various processes.

Table 5. Distribution of total working hours between SHK's various processes.

Process	Proportion in % of total working hours 2012		Proportion in % of total working hours 2013		Proportion in % of total working hours 2014	
	All employees	Investigators	All employees	Investigators	All employees	Investigators
Accident and incident investigations	55	70	48	62	49	61
Co-operation with safety authorities	7	7	6	6	8	9
Professional development	5	6	8	11	8	11
Planning and follow-up	16	10	18	12	16	13
Support	17	7	20	9	19	6

SHK's core tasks include investigative work, national and international co-operation with other authorities etc. on safety issues, and individual professional development. In 2014, 65 per cent of the total working hours have been spent on SHK's core activities. This is an increase of three percentage points in comparison with the previous

year, when the proportion was 62 per cent. For SHK's accident investigators, the proportion was 81 per cent of the total time, which is an increase of two percentage points in comparison with 2013 when the proportion was 79 per cent.

The increase in time spent on core activities is largely explained by the internal training courses and seminars conducted in 2013 regarding the employee support process. This consumed resources, to the disadvantage of the core activities. These kinds of training courses have not been conducted to the same extent in 2014.

The decrease in time spent on support activities in favour of core activities is also explained by the fact that in 2013 some resources were allocated to the introduction of SHK's electronic file management system. This work has continued in 2014 but has not involved SHK's accident investigators to the same extent.

The proportion of time for co-operation with e.g. safety authorities has increased by two percentage points in comparison with the previous year. This is explained by SHK having invested more time in international networking in 2014 than in 2013. Among other things, SHK this year hosted the 41st meeting of the European Civil Aviation Conference/Expert Group on Accident and Incident Investigations (ECAC-ACC).

Key performance indicator no. 4 – The number and proportion of full time employees (FTE) in administrative or other supporting functions in relation to the total number of FTE.

As a measure of efficiency and sound economic management, FTE in administrative and other support functions are reported in relation to SHK's total FTE. A decrease in the proportion of such functions in relation to the number of staff in the core activities may be an indicator that the authority's activities are being run more efficiently. Too small a proportion may however mean that staff in the core activities need to spend more of their working hours on administration at the risk of decreased productivity. Based on the authority's current remit and organisational structure, SHK considers that in order to achieve efficiency and a good balance between supporting and core activities, the proportion of administrative and other support functions should not exceed 30 per cent of the total FTE.

Table 6. Number and proportion of administrative and other support functions in relation to SHK's total FTE.

Year	Total FTE	Number of FTE in administrative and other support functions	Proportion of FTE in administrative and other support functions, of the total FTE.
2012	24.30	5.86	24 %
2013	27.06	6.54	24 %
2014	27.95	6.98	25 %

When looking at the administrative and other support functions as a proportion of SHK's total FTE in 2014, this proportion has increased marginally in comparison with the previous year. The increase is due to SHK taking on a department coordinator for the administrative department. The department coordinator's duties mainly consist of administrating a number of SHK's support processes and of supporting the administrative director and human resources officer in the daily operations. The need to add a further administrator to the staff has been due to the increase in the number of investigators with permanent contracts, which has led to a greater need for administrative support.

SHK, which is a relatively small authority, procures certain services externally in the area of administration in order to achieve cost effectiveness. These services include the areas of financial and human resource administration, IT operations and support, as well as support for larger public procurement projects. These services are not included in the statistics above.

Key performance indicator no. 5 – Costs for administrative support in relation to total operational costs.

As an additional indicator of efficiency and sound economic management, an account is given below of the cost of SHK's various forms of administrative support in relation to SHK's total operational budget (costs attributable to specific investigations not included), as well as an overview of this cost trend over time.

Reasoning similar to the above can also be applied here. A reduction of the proportion of costs for the administrative support can be an indication that the authority's operations have been run more efficiently, but reduced resources in the support functions can also mean that staff in the core activities have to allocate more of their working hours to administrative duties at the risk of reduced productivity in the core activities. SHK assesses that in order to achieve efficiency and a good balance between the support and core activities, the costs for administrative support should not exceed 20 per cent of SHK's total operational costs.

Table 7. Costs for administrative support in relation to total operational costs.

Year	Costs for administrative support in relation to total operational costs
2012	17.9 %
2013	16.5 %
2014	17.4 %

The costs for the administrative support include salaries for staff and services contracted externally with respect to management, finances, registry, IT, communications/information, public procurement and other internal services.

SHK's costs for administrative support in relation to the total operational costs have increased by just under 1 percentage point in comparison with the previous year. The increase is due to the rise in the actual salary costs for the administrative staff in relation to the total operational costs. The cost of externally contracted services in 2014 is somewhat lower than that for 2013.

Other measures to increase efficiency

In addition to the key performance indicators above, SHK will account below for other significant measures taken in order to increase efficiency and improve resource management in the long term.

SHK's operations management system

The work to develop an operations management system for SHK, which began in 2010, has continued in 2014 and will be concluded in 2015. The operations management system is expected to add greater clarity to how SHK's operations work and create a comprehensive view in which the core and support activities are well-defined and the division of responsibility clear. Furthermore, the system is expected to facilitate the transfer of knowledge and more uniform working methods, and reduce unnecessary administration. An effective operations management system will also lay the foundations for suitable procedures for follow-up and evaluation of operational performance.

Introduction of an electronic file management system

With the purpose of increasing the efficiency of SHK's file management, an electronic support system for file management was introduced on 1 January 2014.

Development of SHK's website and intranet

In 2014, a project was started to improve SHK's internal and external communications by developing SHK's website and creating an intranet.

2.2.7 Costs

SHK has chosen to account for the costs for 2014 by the categories of *specific investigative costs* and *general operational costs*. Specific investigative costs are costs directly attributable to individual investigations, and general operational costs are costs for staff, training, intelligence, co-operation with other safety authorities, premises management and other running costs which are not directly attributable to a specific investigation.

Specific investigative costs

Table 1. Specific investigative costs (SEK thousands).

Year	Civil aviation	Civil maritime	Rail traffic	Military events	Other events	Total
2012	1,344	664	979	11,448	1,360	15,795
2013	1,458	640	602	1,209	1,345	5,254
2014	1,314	628	285	364	727	3,318

The specific investigative costs are event-driven and are decided primarily by which investigative initiatives are required and how much support from external specialists and consultants is required for ongoing investigations and investigations concluded during the year. SHK's specific investigative costs have decreased by SEK 1,936,000 in comparison with the previous year. This is largely explained by the fact that the accident that occurred on 15 March 2012, when a Hercules aircraft belonging to the Royal Norwegian Air Force crashed in the Kebnekaise massif, generated considerable costs also in 2013 (SEK 1,140,000).

SHK's strategy of increasing the number of investigators with permanent contracts rather than using contracted external consultants has contributed to a continuous decrease in the costs for consultants in recent years. With the exception of the costs generated in 2012 and 2013 by the Kebnekaise investigation, the specific investigative costs have decreased sharply for several years.

General operational costs

Table 2. Other operational costs (SEK thousands).

Year	Civil aviation	Civil maritime	Rail traffic	Military events	Other events	Total
2012	9,839	5,478	6,489	7,397	2,361	31,564
2013	12,186	7,581	7,588	6,727	2,431	36,513
2014	15,199	9,948	6,558	1,882	2,824	36,411

SHK's general operational costs have decreased marginally in comparison with the previous year. The fact that general operational costs have not increased in 2014 is due to staff appointments taking place later than planned and due to one investigator having chosen to leave and one department manager having been on leave of absence.

The distribution of these other operational costs is also event-driven in the sense that they have been distributed on the basis of how the total number of working hours have been distributed over the different areas of investigation.

In the area of civil aviation, general operational costs have increased by SEK 3,013,000 since the previous year. This is largely explained by SHK's two military investigators having been involved in a lot of investigations on the civil aviation side of operations in 2014. That is

mirrored by the fact that the general operational costs in the military area have decreased in 2014.

The cost increase of SEK 2,367,000 in the area of maritime operations is explained by the recruitments to new positions in the latter half of 2013 (two investigators) and in 2014 (one investigator).

In the area of rail traffic, general operational costs have decreased by SEK 1,000,000 compared with 2013. This is explained by the fact that there were more resources allocated to the ongoing investigations in 2013 than in 2014.

Total costs per area of investigation

Table 3. Total costs (SEK thousands).

Year	Civil aviation	Civil maritime	Rail traffic	Military events	Other events	Total
2012	11,183	6,142	7,468	18,845	3,721	47,359
2013	13,644	8,221	8,190	7,936	3,776	41,767
2014	16,513	10,576	6,843	2,247	3,551	39,729