



Report of the State Comptroller of Israel |
November 2022

Civil Aviation Authority

Civil Aviation Safety



Civil Aviation Safety

Background

The aviation industry in Israel is of great strategic importance from defense and economic aspects. It is the primary transportation means for passengers in and out of the State of Israel. In aviation, human error or a technical malfunction may have severe consequences to human life onboard and on the ground. Therefore, the aviation industry is characterized by a high level of regulation and laws. Under the Civil Aviation Authority Law, 2005, the Civil Aviation Authority (CAA) is responsible for the regulation of the aviation sector in Israel, including licensing procedures, supervision and control of aircraft, airlines, flight crews, testing institutes, and flight schools, and for the ongoing maintenance of the aircraft's and flight crew's competence.

According to CAA data, in 2019, and before the covid-19 pandemic, there were 115 accidents in commercial and civil aviation worldwide, higher than the five-year average, which is 90.2 accidents. The total number of fatalities that year was 239 passengers and crew members. This increase in the number of accidents and the accident rate worldwide in commercial and civil aviation broke a long-standing streak of decrease in the global accident rate until 2016.



Key Figures

**1,159
and
7,831**

in 2021, there were 1,159 CAA-licensed aircraft in Israel and 7,831 CAA-licensed pilots. An increase of 27% and 9.3% compared to 2018 (respectively)

**59 airports
and landing
strips**

operated in Israel in 2021, of which 54 are landing strips, compared to 87 airports and landing strips in the past, of which 80 were landing strips. Most of the landing strips serve agricultural spraying aircraft and are not for public use

1,749

aviation safety incidents in Israel in 2021, 33 of which were severe. In 2020 – 1,318 incidents, 21 of which were severe; In 2019 – 2,677 incidents, 39 of which were severe¹

18

the number of aviation accidents in Israel in 2021, 9 in general aviation and 7 in sports aviation. In 2020, 29 accidents occurred; In 2019 – 39; In 2018 – 54

6

fatalities and 9 injured in aircraft accidents in 2021 in Israel. In 2020, the fatalities and wounded in aircraft accidents were 2 and 10, respectively; and in 2019 – 2 and 14, respectively

**25%–33%
only**

the recommendations rate noted in the Ministry of Transport's Chief Investigator's reports completely implemented by CAA in 2019–2021; And in 2017–2018 – 41%–50%, respectively

52

Israel's ranking out of 193 countries by the ICAO organization indicating compliance with global safety standards and aviation regulatory bodies effectiveness

11 years

since the government recognized the national need to establish another international civil airport as a complementary airport to Ben Gurion Airport (July 2011)

¹ In 2020 and 2021, the aviation industry wasn't very active due to the coronavirus, and accordingly the number of reports decreased.



Audit Actions



From March 2021 to March 2022, the State Comptroller's Office examined civil aviation safety, including airspace management, the cyber threat in aviation, compliance with international standards, the aviation infrastructure, and the investigation of aviation accidents and incidents. The audit was conducted at the Civil Aviation Authority, and completion examinations were done in the Airports Authority (IAA) and the Israel Police.

This report was presented to the Prime Minister on July 31, 2022, and was classified as confidential until its discussion at the State Audit Committee's Subcommittee. Under the authority vested upon the State Comptroller in Section 17(c) of the State Comptroller's Law, 1958 [Consolidated Version], considering the government's reasoning, consulting with the bodies entrusted with the security of defense information, in coordination with the Knesset chairman, and as the said subcommittee did not convene, it was decided to publish this report while classifying as confidential parts thereof. These sections will not be submitted to the Knesset and will not be published.

The audit report's findings and recommendations are correct as of the aforementioned date of its publication.

Key Findings




CAA's Supervision of Aviation Activity – the aviation industry in Israel is growing, and its activity is increasing. In 2018–2021 the number of aircraft (1,159 in 2021 compared to 913 in 2018), of pilot license holders, including trainees (7,831 compared to 7,164), of airlines and aviation entities (88 compared to 78) increased. Still, it was found that the number of CAA inspections declined from 899 planned in 2021 to 1,035 in 2019. Moreover, in 2019 and 2021, the execution rate of the planned inspections was about 90%, compared to 82.7% in 2020 due to the Covid-19 pandemic. In 2020, the inspections of commercial aviation operators and routes decreased (a field related to commercial aviation operators) to 48.8% and 26.3%, respectively, compared to the planned number. In 2021, recovery was evident, but the execution rate of the inspection activities compared to the number planned has not returned to pre-Covid-19 levels.





Traffic Management in Israel's Airspace – Israel's airspace is divided into three: airspace for civil aviation use, airspace for military aviation use allowing civil aviation use, and airspace for military aviation use only. The airspace for civil aviation use is limited, and most of the airspace and air traffic is controlled by the Air Force. It was raised that




the increase in the domestic light aircraft activity operating in the areas managed by the Air Force creates a burden on traffic management, which could affect domestic aviation safety. However, the IAA does not supply the Air Force with adequate data and tools for civil aviation management, such as flight planning data and auxiliary systems equipment, and the IAA's budgetary participation the Air Force received was terminated by the IAA unilaterally.

 **Use of Air Force Equipment to Manage Civil Air Traffic** – the Air Force equipment to manage civil air traffic does not meet the performance and maintenance requirements of the ICAO organization² and Israeli law. The CAA could not perform civilian inspection on said equipment as the system is military. The IAA was not allowed to access the military's information. Moreover, the Air Force's maintenance procedures do not meet civilian standards as required by ICAO requirements.

 **IAA's Supervision of Air Traffic Through the ARTS System** – the ARTS system (Automated Radar Terminal System) is a computerized air traffic management system enabling the air traffic controller to track aircraft. The system combines all the updated information from humans and radars to create a more accurate aerial picture. It was raised that over the years, the system can no longer be maintained due to high costs and the obsolescence of its components. Moreover, due to the system's obsolescence, making changes and adjustments in an advanced and modern flight control environment is impossible. The outdated ARTS system does not meet ICAO requirements and international standards.

 **Forming the Aerial Screen Display** – the Air Force control units operate according to military standards, which are different from those of civil aviation and do not always coincide with the international rules designed to maintain civil aviation safety to which the State of Israel is committed. It was found that for two months from August 10, 2021, there were 11 malfunctions in the aerial picture, including an aircraft that disappeared from the screen; Momentary or five seconds image disappearing, and low tracking ability after the image reappearing; screen display delay of aircraft coming from the west; Multiple screen display delays incidents of aircraft taking off from Tel Aviv; And low tracking of aircraft from the West. Such malfunctions may affect the safety of Israeli and international civil aviation operating in Israel's airspace and harm the efficient management of civil air traffic.

 **The Interrelationship Between the IAA and the Air Force** – it was raised that critical issues of air traffic management, posing a safety risk to civil aviation and to the efficiency of air traffic management, require cooperation between the IAA and the Air Force, are not resolved due to disagreement over the following issues: providing mutual services; Improving the quality of the aerial display and its reliability; And the control

² International Civil Aviation Organization – The international body working to ensure uniformity in the regulations, rules and standards of civil aviation between countries.



units physical conditions increasing manpower on duty due to the increase in air traffic in Israel's airspace. The mutual services agreement between the Air Force and the IAA expired on December 31, 2019, and at the audit completion, it was not renewed.



Electronic Jamming – electronic jamming may affect the safety level of civil aircraft. It was raised that the IAA occasionally experiences electronic jamming and that its tools are not effective enough to handle such jamming, to inform the flight crews of the jamming and of the alternatives they should take.



Closing the Herzliya Airfield and Finding an Alternative Field – the Herzliya Airfield was active and founded even before the establishment of the state. It has been operated by the IAA since 1978, and it is currently used as the main general aviation airport in Israel to operate flight schools and maintain pilot qualifications. In 2009, the National Council designated the Herzliya field as a temporary field due to its location in a populated area, and the Israeli government considered and promoted an alternative field for the Herzliya field in the Ein Shemer area. Despite the great importance of establishing a central airfield for the general aviation industry, and even though closing the Herzliya field has been on the agenda since 2009, and 13 years have passed since the government's resolution 2009, the Ministry of Transportation and the IAA have not found a suitable alternative to the Herzliya field. Moreover, the Herzliya field is on land defined as agricultural, and it operated all these years without planning regulations as an airfield. Notwithstanding, during the decades of the field's activity, the Ministry of Transportation and the IAA did not statutorily regulate the field and permitted its operation.



The Establishment of a Supplementary Airport to Ben Gurion Airport – despite the government's resolution to promote a supplementary airport to Ben Gurion Airport in July 2011 and October 2014, recognizing the urgent need to establish another international civil airport, and despite the professionals' recommendations in November 2017 about the preferred and applicable alternative, from the defense, aviation, and economic aspects, the location of an additional airport was not decided upon. The matter reappeared in the government's resolution in October 2021.



Investigation of Aviation Accidents and Incidents – under the Aviation Law, 2011 (the Aviation Law), the Minister of Transportation appointed a chief investigator for safety investigations.

- It was raised that in 2017–2021 there were differences between CAA's data and the Chief Investigator's data, especially on accidents and injured persons. The Chief Investigator's figures were usually higher than CAA's figures. Regarding the number of fatalities, there were no differences in those years. The Chief Investigator's figures for 2017–2021 regarding accidents were higher than CAA's data by 3.6% up to 54.3%, And regarding injured persons – by 12.5% up to 180%. The main differences were before the covid-19 pandemic when civil aviation operated without restrictions and under normal conditions. The differences between the figures for



accidents in 2017, 2018, and 2019 were 34.6%, 54.3%, and 18.2%, respectively. And the differences between the figures for injured persons in those three years were 14.3%, 162.5%, and 180%, respectively.

- It was raised that the Chief Investigator's recommendations rate implemented by the IAA in 2017–2021 is lower than 50%, and in the three years 2019–2021, the rate varies between 25% and 33% only. In 2017 and 2018, the Ministry of Transportation was given seven and four recommendations, respectively, but none were implemented.
- It was raised that in 2017 there was a decrease in the number of final investigation reports from 28 in 2017 to 15 in 2021, a decrease of about 46%. In 2020, eight final reports were issued due to the Covid-19 pandemic and a decrease in civil aviation activity.
- It was raised that as of the audit completion, March 2022, an independent investigating authority had not been established according to the international standards set by ICAO. Moreover, the Ministry of Transportation notified the ICAO in June 2017 that establishing an independent investigative authority would be addressed by March 1, 2019. In ICAO latest inspection report, it recommended establishing an independent investigation authority. In its absence, the State of Israel's score in the area of aircraft accident investigation dropped from 91% to 63%.



Cyber Supervision of the Commercial Aviation Operators – it was raised that the Commercial Aviation Operators³ were not defined as critical state infrastructure (CSI). Therefore, they are not under the professional supervision of the National Cyber Directorate regarding information security operations. The IAA's ability to supervise Commercial Aviation Operators, testing institutes, and manufacturing industries is limited due to the lack of appropriate authorizing legislation to supervise civil aviation's cyber protection effectively. Furthermore, as of the audit completion, disparities were raised in the IAA's manpower and budget, necessary for supervision in cyber protection.



Preparedness for an Aviation Disaster – it was raised that as of the audit completion, March 2022, Police Ordinance instructions for joint operation, regulating civil emergency events, and the necessary coordination between the police and the rescue agencies operating in the field had not been formulated. Without joint operation instructions, no professional instructions had been written by any of the rescue agencies. Moreover, the search and rescue in an accident not within an airport area is not fully regulated. Hence, the various organizations' search and rescue array operates according to practice, not within a fully regulated and pre-agreed framework, and without division

3 Companies engaged in the commercial operation of large aircraft, pursuant to Chapter 13 of the Aviation Regulations (Operation of Aircraft and Aviation Rules), 5742-1981.



of responsibilities and powers between the parties involved. Therefore, the management of a search and rescue event varies from case to case and is affected by ad hoc decisions and improvisations that may lead to a less-than-optimal result. It was also raised that no exercises simulating a mass aviation disaster outside the airport and in an urban area are being carried out, and the ability of the bodies involved to cope with this type of incident has not been tested.



The Rise in Israel's Ranking – the IAA improved Israel's score in the ICAO test in 2014 and raised Israel's overall ranking compared to other countries from 105th place to 21st place. However, following another ICAO test in Israel in 2016, in aircraft accident investigations, Israel's overall score declined from 21st to 39th place. As of June 2022, Israel's overall ranking was 52nd.

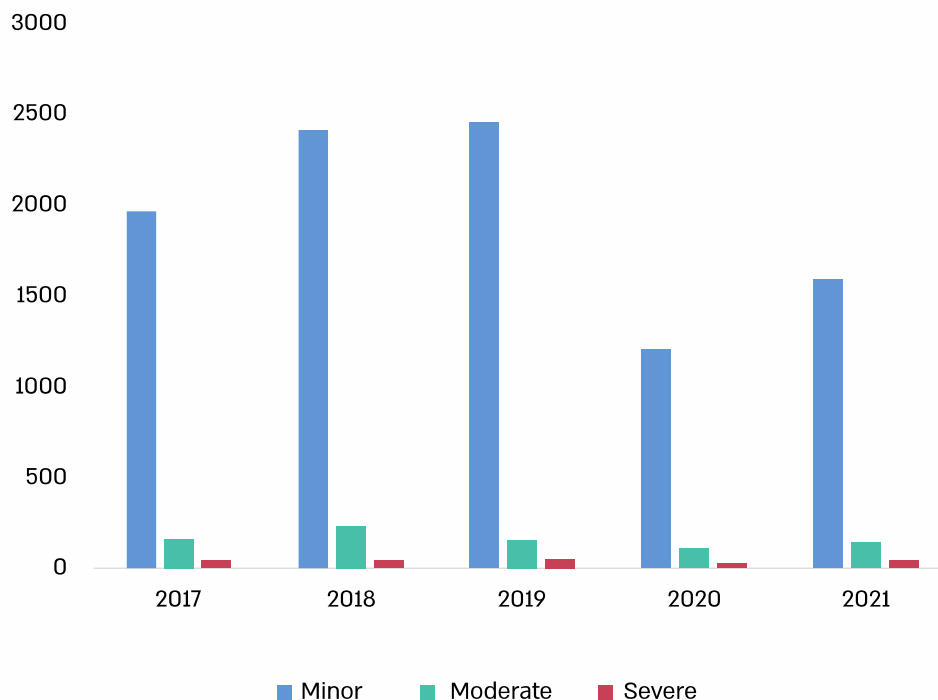
Key Recommendations

- 💡 It is recommended that the Ministry of Transportation, the IAA, and the Ministry of Defense, given the continuous expansion of civil aviation activity, examine in depth from time to time the allocation of airspace for various uses, considering the interests of the defense, civil aviation safety and air traffic management, economic, and of Israel's foreign relations.
- 💡 It is recommended that the IAA, the CAA, and the Air Force not settle for regulating an exemption for the outdated auxiliary flight facilities but also ensure that all the facilities used by the IAA for air traffic control, meet the international standard, including the radars and the Air Force's information processing system, and the IAA's ARTS system, to improve the level of aviation safety. The IAA should refine its procedures and methods of dealing with electronic jamming, consider, with the approval and cooperation of the IAA, new ways and technologies for coping, and pass them to the airlines. It is also recommended that the Air Force and the IAA increase their collaboration on electronic jamming.
- 💡 It is recommended that the IAA and the Air Force examine in depth the cooperation level between them regarding the management of civil air traffic and the reasons and causes – human and technological – for the many malfunctions, consider upgrades and updates of the systems to increase their reliability, conduct investigations and draw lessons in each case of malfunction, create joint working procedures for the IAA and the Air Force and build a mutual coordination system, all this to improve conduct in the control units, prevent unnecessary risks and improve the safety of civil aviation according to the accepted standards in the world.
- 💡 The Ministry of Transportation is recommended to establish an independent investigation authority according to internationally accepted standards and ICAO's recommendation from June 2017. The IAA is recommended to fully implement the supervision's work plan,



particularly regarding commercial aviation operator and route supervision. It is recommended that the IAA, the Ministry of Transportation, and the National Cyber Directorate cooperate with the Ministry of Finance and the Civil Service Commission to consider allocating resources and recruiting suitable personnel for implementing the policy and the recommendations to improve cyber protection in aviation.

The Number of Reports on Aviation Safety Incidents in Israel



According to IAA data processed by the State Comptroller's Office.



Summary

By the audit, issues related to aviation safety have not been regulated or are not at the optimal safety level. The findings indicate that air traffic management in cooperation with the Air Force in Israel's congested airspace is done with outdated equipment that is not adapted to advanced technologies, and with auxiliary flight facilities that do not meet the international standard and the requirements of Israeli law, creating malfunctions in the aerial screen display and affect the safety of air traffic and the efficiency of its management; For years, there has been no response to infrastructure ventures that are essential for both the development of aviation and for safety, such as a supplementary field to Ben Gurion Airport and an alternative field for general aviation; The rate of the recommendations of the Ministry of Transportation's Chief Investigator implemented by the IAA ranges in 2019–2021 between 25% and 33%, affecting the lessons drawing from investigation, and preventing accidents and incidents in the future; The IAA cannot improve cyber aviation regulation and maintain effective supervision of aviation entities, in the absence of authorizing legislation, of personnel and budget measures; In the following – licensing of companies, general operation of airplanes and helicopters, licensing of pilots and testing institutes – the standard in Israel does not meet international standards, and out of the 1,827 ICAO standards, 670 (37%) are partially implemented, affecting Israel's safety rating compared to other countries.

It is recommended that the CAA, the Ministry of Transportation, the IAA, and the Air Force rectify the deficiencies raised in this report and consider implementing their recommendations. Among other things, they should address the airspace and air traffic management; Reconcile the differences of opinion between the IAA and the Air Force on this issue; Promote the use of auxiliary flight facilities that meet the international standard; develop aviation infrastructure, all of this to improve aviation safety and enable efficient aviation management.

