



Report of the State Comptroller of Israel | March 2022

Ministry of Defense

Managing the Research and Development Programs in the Defense Establishment – Follow-up Audit



Managing the Research and Development Programs in the Defense Establishment – Follow-up Audit

Background

The Research and Development in the Defense Establishment of the State of Israel is a significant component in building its military might and reinforcing its security. This field includes a wide range of activities – from basic research to the pre-development stage (R&D) and full development until obtaining a weapon or combat accessory¹. Many bodies are involved in this extensive activity, including the Ministry of Defense and the IDF, the military industries, academic institutions, and research bodies – all invest billions of NIS in defense-related R&D each year. The Administration for the Development of Weapons and Technological Infrastructure (MAFAT) in the Defense establishment² is a joint Ministry of Defense and IDF body³. MAFAT is in charge of the R&D of weapons and the technological defense infrastructure to ensure Israel's capability of developing the weapons required for IDF buildup and strength. For this purpose, a designated annual budget was put at its disposal, out of the IDF budget framework, used mainly for R&D activity (the main R&D budget).

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- 1 In this report, the distinction between R&D and complete development is made in order to differentiate between the different types of research and development activity carried out in the various bodies of the defense establishment.
 - 2 Defense establishment in this report – IDF and Ministry of Defense
 - 3 The head of MAFAT is subordinate to the Director-General of the Ministry of Defense in topics that the Ministry of Defense is in charge of, and the military Chief of Staff in topics of which the IDF is in charge.



Key figures

several hundred million NIS

the main annual R&D budget (NIS) in the years 2018–2020

several billion NIS

on all R&D expenditure in the defense establishment in 2020 not including the participation of external bodies

several billion USD

the scope of engagement of the defense establishment in the years 2016–2020 in cooperation plans with foreign countries (GTG⁴) as part of establishment export agreements

several billion NIS

investment of the three largest defense industries⁵ in self R&D in 2020

Audit actions



In 2018, the State Comptroller's office published an audit report on the Management of the R&D Programs in the Defense establishment⁶ (the previous audit). The issues examined included: forming the overall defense development program; determining MAFAT's R&D budget; the interrelations between MAFAT and the IDF in the R&D field; management and preservation of the information in MAFAT; and the normative foundation for regulating the R&D field in the Ministry of Defense and the IDF. From October 2020 to July 2021, the State Comptroller's office intermittently conducted a follow-up audit to examine whether the main deficiencies noted in the previous audit have been rectified. The follow-up audit was conducted at the Ministry of Defense and the IDF.

4 Government To Government. Along with the parties' signing of these agreements, the Ministry of Defense signs on behalf of the State of Israel "back to back" agreements with the Israeli defense industries, including an undertaking by the defense industries to realize the commitments made by the state with regard to the development and production of weaponry. As part of these agreements, the Ministry of Defense will receive, inter alia, at no charge, a budget framework for industries-oriented R&D.

5 The Israel Aerospace Industries Ltd., Rafael Advanced Defense Systems Ltd., and Elbit Systems Ltd.

6 The State Comptroller, Annual Report 69A (2018): Management of the Research and Development Programs in the Defense Establishment, pp. 695-767.



This report was presented to the Prime Minister and the State Control Committee of the Knesset on December 30, 2021.

By the authority under Section 17(c) of the State Comptroller Law 1958 [Consolidated Version] and after considering the government's arguments, consulting with the protection of national security information bodies and coordination with the Chairman of the Knesset, and since the subcommittee of the State Control Committee failed to convene, it was decided to publish this report while imposing confidentiality on sections of it. These sections shall not be submitted to the Knesset, nor shall they be published.

The findings of the audit report and its recommendations are valid as of the above date of its presentation.

Key findings




Overall defense development program – the previous audit raised that despite the responsibility assigned to it, MAFAT failed to gather data regarding the R&D in all IDF bodies, the Ministry of Defense, and the self R&D programs in the defense industries; nor has it prepared a comprehensive defense-related development plan, among other things, to be presented by the Head of MAFAT to the heads of the defense establishment. The follow-up audit raised that the deficiency was not rectified: the Ministry of Defense has not examined, jointly with the IDF, ways of enabling a comprehensive view of the activity in this field based on the same reasons noted in the previous audit; MAFAT has failed to gather and present to the Director-General of the Ministry of Defense and the Chief of Staff data on the R&D plans in all of IDF bodies, on the Ministry of Defense, and on the self R&D plans in the defense industries. It has also canceled the order on the "Overall Defense Development Project."





Determining the main R&D budget – the previous audit raised that the main R&D budget was determined without preliminary staff work, considering relevant matters, such as the financial scope of all stages of defense R&D and their characteristics, the R&D needs of the Ministry of Defense, various options for the realization of these needs, IDF buildup plans, and its investment budget in complete development projects and armament. The follow-up audit found that the main R&D budget in the years 2018–2021, about hundreds of millions of NIS a year, remained unchanged (without participation) and that the deficiency had been slightly rectified: MAFAT presented its main R&D budget requirements regarding different parameters such as the main R&D budget compared to the entire defense budget (including elements not connected to IDF buildups such as current subsistence costs, and construction and rehabilitation costs). In projects performed by MAFAT, there were gaps between the presentation of vital data and parameters and the overall budget – such as the total participation of the defense industries in the R&D plans, the scope of payments received in the GTG




agreements, the R&D stages performed as part of them, and potential IDF armament from the R&D plans, considering the budget available for this purpose.

 **Management of the data on R&D and complete development in the defense establishment** – the previous audit found significant gaps (even more than 100%) in the data on all R&D and complete development carried out in the defense establishment and reported over the years by the various factors in the Ministry of Defense⁷. The follow-up audit found that the deficiency was slightly rectified: gaps between the reports still exist, and the Ministry of Defense has not capitalized the development and armament costs as an intangible asset but instead registered them under the "armament and projects expenses" clause – not according to accounting standards; therefore, the financial statements do not provide complete information on the scope of initial development and armament, even in the explanation of the financial statements.

 **Effectiveness of the main R&D programs** – the previous audit raised that in many cases, the IDF chose not to advance technological capabilities achieved by MAFAT due to various priorities and budget constraints. Furthermore, MAFAT and the Planning Directorate⁸ failed to survey the advancement of the main development outcomes that are ready for complete development projects in the IDF and they lacked organized data on the matter. The follow-up audit found that the deficiency was slightly rectified: even though many R&D programs, with an emphasis on those that reached pre-development, are not advanced to complete development projects and armament; and MAFAT and the Planning Directorate do not perform an orderly methodical survey on them to conclude and improve R&D efforts.

 **Management and retention of information in MAFAT** – the previous audit raised that MAFAT lacked advanced data systems to manage its R&D programs and complete development projects; MAFAT lacks a consolidated system of the technological data accumulated during the execution of R&D programs, and that MAFAT does not methodically retain data about development processes that were halted or failed. The follow-up audit found that the deficiency was partially rectified: MAFAT upgraded and improved the data systems used by it; however, at the end of the follow-up audit, gaps still existed in this field: the data systems do not manage substantial data; such as the sums contributed by the industries and IDF bodies in MAFAT's R&D programs; the data systems do not support the activity performed in its administrations, and MAFAT has no data system to preserve its technological knowledge.

 **The normative foundation in the Ministry of Defense for R&D activity** – the previous audit raised that eight of the procedures concerning MAFAT and R&D in the defense establishment had not been updated for years, with four of them updated during the previous audit. However, specific procedures on important matters remained

⁷ In the financial statement of the Ministry of Defense and reporting to the Central Bureau of Statistics (CBS).

⁸ Until June 2020 this directorate was called the Planning Directorate. After that it was split into two directorates.



outdated, and some fields of MAFAT activity, including its work interrelations with the IDF, had still not been regulated in Ministry of Defense procedures. The follow-up audit found that the deficiency was partially rectified: at the audit end date, two procedures had been updated, one was being updated, and another was canceled. As part of the procedure updates, MAFAT roles and responsibilities defined in the procedures were partially reduced; for example, control of the development programs of IDF bodies and defense industries and consulting the Minister of Defense, Director-General of the Ministry of Defense, and the Chief of Staff regarding these fields. MAFAT's activity in R&D, including its interrelations with IDF bodies in this field, has not been regulated in Defense Ministry procedures, nor has procedures conserving the handling of GTG deals been completed.



The normative foundation for R&D activity in the IDF – the previous audit raised that the IDF did not have General Staff or Supreme Command regulations concerning R&D or interrelations between IDF bodies and MAFAT. This, although regulations on some of these issues exist in the Ministry of Defense and despite the need that both of them issue parallel regulations. It also raised that the organizational command of MAFAT, which determines its mission, roles, and organizational structure, has not been updated in a decade. The follow-up audit found that the deficiency had not been rectified: General Staff lacks regulations regarding R&D or interrelations between IDF bodies and MAFAT, even though some of the Ministry of Defense regulations include topics common to the IDF, liable over them. In addition, no updated organizational order has been published, even though in March 2020, the Ministry of Defense issued an updated organizational regulation for MAFAT.



The interrelations between MAFAT and the IDF in the R&D field – the previous audit raised that the interrelations between MAFAT and the IDF in the R&D area – including the transfer of data, its examination, and the forming of R&D programs in response to IDF needs in the short and long term—was not sufficiently established, organized or systematic. It also raised that the presentation of plans to the Planning Directorate as part of the approval of the annual working plan was partial and general, and the involvement of the Planning Directorate in the various R&D plans was limited. In addition, it failed to effectively control the implementation of the annual working plan. The audit also raised that due to the IDF's poor evaluation of its operational and long-term buildup needs, it failed to effectively focus MAFAT within this time range and did not systematically and orderly communicate its future needs to MAFAT.

The follow-up audit found that the deficiency had been considerably rectified. Improvements were made in the interrelations and cooperation between MAFAT and the IDF: regarding the strengthening the ability of the General Staff to direct buildup, including R&D; and the strategic approach in MAFAT's R&D unit, initiated by the head of the unit, to improve the interrelations and partnership with the IDF. However, R&D is directed without defining



priorities, budget scopes, and timetables required for reaching the technological solution. Rules have not been made to optimize working relations in R&D, and the nature of the interface between MAFAT and the IDF has been determined mainly by the judgement of the various factors in these bodies.

Key recommendations



It is recommended that the Ministry of Defence complete the staff work to examine the overall defense development program to gather all the data required for its presentation. This is to exhaust the resources invested in this field and maximize its achievements and the oversight by the Ministry of Defense and General Staff administration. As part of the staff work, it is recommended to consider whom to assign the data gathering, especially since the procedure about MAFAT's responsibility for this matter has been canceled.



It is recommended that the Ministry of Defense and the IDF examine the main R&D budget according to its goals and purpose and the IDF's needs and buildup priorities. This, considering its limited resources it allocates to development and armament projects, within the financial scope of all defense R&D aspects and their characteristics; and including collaboration with MAFAT in the R&D programs it's promoting in Israel and abroad and in the defense industries' activity as part of their self R&D.



It is recommended that the financial report of the finance department in the Ministry of Defense include complete information on the scope of initial development and armament carried out by the defense establishment every year. This is part of the methodology for mapping all investments in R&D in the Ministry of Defense.







It is recommended that the General Staff proceed to influence the R&D work plan, by increasing its involvement and oversight with MAFAT's overall R&D activity, using determined tools and indexes. It is also recommended that the Planning Directorate and MAFAT form agreed-upon rules and principals regarding coordination and control of R&D programs with the IDF to reduce gaps between R&D investment and operational needs.






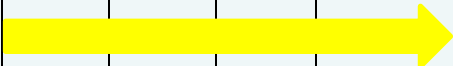
It is recommended that MAFAT and the Planning Directorate determine together effective evaluation indexes for R&D programs, especially those ready to be completely developed, and systematically survey performance regarding R&D, according to the agreed-upon indexes, for investigating and concluding. Given the dynamic characteristics of R&D programs and the long duration of their executions, it is recommended to perform tracking on a multi-annual basis.



-  It is recommended that the Director-General of the Ministry of Defense establish an external forum for MAFAT to examine its R&D activity, including the framework of its meetings.
-  It is recommended that MAFAT develop mechanized data systems to manage its activity, both R&D programs and complete development projects, including activity performed as part of the administrations under its charge. In addition, it is recommended that MAFAT share data accumulated in the data system with the bodies dealing in R&D and complete development in the defense system, within necessary restrictions.
-  It is recommended that MAFAT regulate its activity, including R&D and required work interfaces vis-à-vis the IDF. Due to the reduction in MAFAT's responsibility regarding the integration of R&D activity in the defense system, and the control and monitoring thereof, it is recommended that the Director-General of the Ministry of Defense and the Chief of Staff examine appointing a responsible body to control and track all the activity in this area.
-  It is recommended that the Planning Directorate, in coordination with MAFAT, conduct staff work to complete the provisions regarding R&D and the required cooperation between the IDF and MAFAT. The IDF should include mechanisms designed to increase its involvement in the main R&D programs while basing the commitment of all parties involved to exhaustion of the R&D planning process and drawing the maximum benefit from it. It is further recommended that MAFAT and the Planning Directorate update MAFAT's organizational command to express the changes made in its mission, roles, and organizational structure.



R&D in the defense establishment – follow-up audit's key findings

Management of R&D programs in the defense establishment						
Audit chapter	Deficiencies in previous audit reports	Degree to which deficiencies have been rectified according to follow-up report				
		Not rectified	Slightly rectified	Partially rectified	Considerably rectified	Fully rectified
Overall defense development program						
Overall defense development program	MAFAT has not gathered data on the R&D plans in all of IDF bodies, in the Ministry of Defense and on self R&D plans in the defense industries, to present a comprehensive defense R&D plan to the heads of the defense system.					
Determining the main R&D budget and management of R&D, and complete development data in the defense establishment						
Determining the main R&D budget	The main R&D budget was determined without considering vital issues.					
Management of R&D and complete development data in the defense system	Considerable gaps exist between the various reports on overall R&D and complete development expenditures in the defense system.					
Interrelations in the R&D area between MAFAT and the IDF						
The interrelations between MAFAT and the IDF in the R&D field	The R&D interrelations between MAFAT and the IDF had not been sufficiently established, organized, and systematic, and the involvement of the Planning Directorate was limited.					



Management of R&D programs in the defense establishment						
Audit chapter	Deficiencies in previous audit reports	Degree to which deficiencies have been rectified according to follow-up report				
		Not rectified	Slightly rectified	Partially rectified	Considerably rectified	Fully rectified
Effectiveness of the main R&D programs	In many cases, the IDF chose not to advance technological capabilities obtained through MAFAT to complete development projects due to the priorities of the relevant IDF bodies and budget constraints. This, without conducting tracking by MAFAT and the Planning Directorate.					
Management and retention of data in MAPAT						
Management and retention of knowledge in MAFAT	MAFAT did not have advanced data systems to manage all of its R&D activity regarding programs and complete development projects, nor was there a consolidated system for the technical data accumulated during the executions of the R&D programs.					
Regulating of R&D in the defense establishment						
The normative foundation of R&D activity in the Ministry of Defense	A significant part of the procedures for MAFAT R&D in the defense system had not been updated for years. There were areas in MAFAT activity that had not been regulated in Ministry of Defense.					
The normative foundation for R&D activity in the IDF	The IDF did not have General Staff R&D regulations, and MAFAT's organizational order had not been updated for a decade.					



Summary

The Research and Development in the Defense Establishment of the State of Israel is a significant component in building its military might and reinforcing its security. The previous audit report noted R&D management deficiencies and the control thereof in the defense system, including budgeting and planning regulations and formation of the work plan and the interrelations between MAFAT and IDF bodies; means used by MAFAT to manage R&D activity; and oversight of this activity by the Chief of Staff. The follow-up audit raised that certain deficiencies had been rectified, some to a large extent and others only to a small extent. In addition, the IDF and MAFAT continue to strengthen the interrelation between them; MAFAT develops and upgrades the data systems supporting its activity, including the formation of R&D plans and budget control thereof; the Ministry of Defense has updated two regulations that had remained unchanged for years. Furthermore, the follow-up audit found that some of the deficiencies had not yet been rectified; for example, the Ministry of Defense and the IDF have not performed staff work to determine the main R&D budget considering vital issues; MAFAT does not possess data on the overall participation of industries and IDF bodies in the R&D plans advanced by it; no systematic tracking of R&D plans is performed regarding R&D programs which have reached the pre-development stage and are not advanced to development and armament projects to conclude and improve R&D efforts; no General Staff provisions have been written in the IDF dealing with R&D or interrelations between IDF bodies and MAFAT. Given the centrality of R&D in IDF buildup and the considerable resources invested in it, the Ministry of Defense and IDF must rectify the deficiencies that have not yet been rectified since the previous audit and optimize R&D efforts to achieve its objectives.