20

SUB-OPTIMUM UTILIZATION OF THE CAPACITIES OF GSAT -18 SATELLITE

DEPARTMENT OF SPACE

COMMITTEE ON PUBLIC ACCOUNTS
(2024-25)

TWENTIETH REPORT

EIGHTEENTH LOK SABHA

सत्यमेव जयते

LOK SABHA SECRETARIAT
NEW DELHI

PAC NO. 2414

T W E N T I E T H R E P O R T

COMMITTEE ON PUBLIC ACCOUNTS
(2024-25)

(EIGHTEENTH LOK SABHA)

SUB-OPTIMUM UTILIZATION OF THE CAPACITIES OF GSAT -18 SATELLITE

DEPARTMENT OF SPACE

Presented to Lok Sabha on: ***26.03.2025***

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LOK SABHA SECRETARIAT
N E W D E L H I

March, 2025 /Chaitra 1947 (Saka)

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COMPOSITION OF THE PUBLIC ACCOUNTS COMMITTEE (2024-25)

Shri K. C. Venugopal - Chairperson

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LOK SABHA

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3. Dr. Nishikant Dubey
4. Shri Jagdambika Pal
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2. Shri Muraleedharan. P - Director
3. Shri Atul Bhave - Deputy Secretary
4. Shri Charanjeet Singh - Committee Officer

INTRODUCTION

I, the Chairperson, Committee on Public Accounts (2024-25) having been authorised by the Committee, do present this 20th Report (18th Lok Sabha) on "Sub optimum utilization of the capacities of GSAT-18 Satellite" based on Para 2.2 of C&AG Report No. 24 of 2023, relating to the Department of Space.

2. The C&AG Report No. 24 of 2023 was laid on the Table of the House on 09.02.2024.

3. The Committee on Public Accounts (2024-2025), selected the aforesaid subject for detailed examination and held informal discussion with the representatives of the Department of Space at Bengaluru on 16.10.2024. Based on the written replies furnished by the Department of Space, the Committee examined the subject in detail.

4. The Committee on Public Accounts (2024-2025) considered and adopted the Draft Report on the aforementioned subject at their Sitting held on 25.03.2025. The Minutes of the Sittings are appended to the Report.

5. For facility of reference and convenience, the Observations and Recommendations of the Committee have been printed in bold and form Part- II of the Report.

6. The Committee would like to express their thanks to the representatives of the Department of Space for furnishing the requisite information to the Committee in connection with the examination of the subject.

7. The Committee also place on record their appreciation of the assistance rendered to them in the matter by the Committee Secretariat and the Office of the Comptroller and Auditor General of India.

NEW DELHI:
25 March, 2025
Chaitra 4, 1947 (*Saka*)

K. C. VENUGOPAL
Chairperson
Committee on Public Accounts

PART- I

INTRODUCTION

The Report of the Committee is based on Para no 2.2 of the C&AG Report No. 24 of 2023. The C&AG Report No. 24 of 2023 for the year ended 2022 contains significant results of the compliance audit of the Department of Space of the Union Government.

The Committee on Public Accounts (2024-25) selected the aforesaid C&AG Report for examination and report. They undertook the detailed examination, held informal discussion with the representatives of the Department concerned during their study visit to Bengaluru and Kochi from 16-18 October, 2024 and obtained written replies to the List of Points.

For facility of reference, the Para no 2.2 “Sub optimum utilization of the capacities of GSAT-18 Satellite” is reproduced below:-

> “As per Rule 70 (iii) of GFR 2017, the Ministry/Department is responsible for effective, efficient, economic and transparent use of its resources. Further, Rule 70 (ix) stated that the Department shall take effective and appropriate steps to ensure to collect all moneys due to the Government and avoid wasteful expenditure. DoS issued financial sanction for development of GSAT-18 satellite for ₹ 1022 crore in May 2015. To ensure the efficient use of the space assets of DOS, the communication satellites shall be efficiently planned for its orbital slots.
>
> The satellite capacity of GSAT-18 satellite is 48 transponders. The transponders are 24 C Band, 12 Extended C Band and 12 Ku Band transponders. As INSAT- 3C reached its end of life in the last quarter of 2016 and INSAT- 4CR in the second quarter of 2019, GSAT-18 was planned as a replacement for the C Band/ Extended C-Band of INSAT-3C Satellite and for 'Ku Band' INSAT-4CR satellite. The existing VSAT services of Extended C Band Transponders of INSAT-3C Satellite were to be shifted to GSAT-18 Satellite.

DoS launched GSAT-18 in October 2016 on an urgent basis through a procured launcher to meet the immediate requirement of protecting the existing users/ services of INSAT-3C in its C and Extended C Band since the satellite is reaching its end of life in Nov 2016.

Audit, however, observed that six extended C-Band transponders of GSAT-18 satellite were not put to use since its launch as these transponders were already available in GSAT-14

Audit further observed that the expenditure incurred towards the realisation of hardware for these six Extended C Band transponders and its external launch service cost was avoidable. The cost of the hardware was ₹13.53 crore and its launch service cost was ₹ 3.74 crore.

DoS stated (Feb 2023) that the expected revenue in these five years is substantial and would be₹117 crore. DoS added that the cost of deployment of additional six extended C Band transponders after the end of life of GSAT-14 satellite (September 2027) in a separate satellite to provide continuity of services would be substantial. DoS further stated that assuming GSAT-18 did not carry these additional 6 Ext C band transponders and these transponders were to be carried on a separate satellite for providing continuity of service, the expenditure would be much higher towards building the satellite and launching it.

Reply of DOS/ISRO need to be viewed in light of the fact that Extended C band spectrum available at 74^0E orbital slot can accommodate only 12 transponders for services over India. When GSAT-18with 12 transponders was launched, GSAT-14 with 6 transponders was in operation, rendering 6 transponders of GSAT-18 idle for time being. It is also pertinent to mention that GSAT-14 satellite has a total of 12 transponders including six Ku Band and six Extended C band and would need continuity after its life in 2027. Thus DoS could plan the placement of transponders in an optimized manner.

Thus, due to improper planning and absence of any mechanism to anticipate the existing capacity has resulted in a situation where six transponders of GSAT-18 are lying unutilized."

The Department of Space in their Background Note have stated :-

(i) GSAT-18 satellite was planned as a follow on satellite to provide continuity of two operational satellites namely INSAT-3C and INSAT-4CR providing communication services over India. INSAT-3C had 24 transponders in C-Band and 6 transponders in Ext-C band. INSAT-4CR had 12 Ku-Band transponders. The predicted End of Life (EOL) for INSAT-3C was November 2016 and INSAT-4CR was June 2019.

(ii) Geostationary orbital slot at 74ºE longitude is the prime orbital slot for India to provide satellite communication services over Indian region. This orbital slot is coordinated with adjacent satellite operator to provide service in C, Ext C & Ku frequency bands and continuous operation of satellite has to be ensured from Orbit-Spectrum protection point of view.

(iii) GSAT-18 satellite was approved in 2015 for providing continuity of satellite services over Indian mainland and island land mass from the geostationary orbital slot of 74ºE longitude with total financial sanction of ₹1022 cr. The GSAT-18 spacecraft was configured with ISRO proven I3-K bus system having total mass of approx. 3.5 ton. GSAT-18 was configured as a combination of C-band, Ext-C and Ku band transponders payload. This spacecraft has been configured with 24 C-band, 12 Ext C-band and 12 Ku Band transponder as total 48 Indian main land & Island coverage transponders.

(iv) While planning GSAT-18 satellite, GSAT-14 satellite was being assembled with 6 Ext C-band and 6 Ku band transponder and proposed to be launched with development flight of GSLV- MKII. The launch capability of GSLV MKII was I3-K bus which could accommodate only 12 transponders.

(v) While planning any satellite at a given orbital slot, several factors are taken into consideration to arrive at an optimum configuration like availability of spectrum, coverage requirement, continuity of service (including spare capacity philosophy) configuration of satellite bus viz-a-viz no. of

transponders that can be accommodated, mission life, lift-off mass envelop (a range of mass) of the launch vehicle, etc.

(vi) Ext C-band has limited radio spectrum available for the satellite communication service. At any co-ordinated longitudinal geostationary orbital slot, maximum of 12 satellite transponder can be planned after incorporating Polarisation reuse concept. Hence, the planning of overlapping 6 Ext C Band transponder was considered with the following reasons:

- GSAT-14 was on-board developmental flight of GSLV MK-II, for which the certainty of the desired performance of the launch vehicle and mission life of satellite was ambiguous.
- All the Ext C-band transponder on-board GSAT-14 were expected to be utilized. Hence, continuity of service and spare capacity availability also needed to be ensured.
- The GSAT-14 designed mission life was estimated up to Sept 2027 and in order to provide service continuity a new satellite with limited capacity was required, which was not feasible fiscally with an exclusive satellite. Hence, carrying these transponders on GSAT-18 was beneficial to ensure continuity from 2027 to 2032. It is also worth mentioning here that protection of orbit-spectrum resource is an essential parameter that was duly considered.
- There are many common on-board systems/subsystems for all the transponders. In view of the above, cost of the six Ext-C band transponder is in-significant compared to its exclusive counterpart.
- The pro-rata calculation of the cost is simplistic approach without consideration of the shared system and other financial implication.

(vii) Therefore, carrying 6 additional Ext C band transponders on GSAT-18 was a cautious decision duly considering the above points including protection of precious and crucial orbit spectrum resource.

2. On being asked why six extended C-Band transponders of GSAT-18 satellite were procured when these transponders were already available in GSAT-14, the Department in their written reply stated as under:-

"GSAT-18 was planned with 24 C-band, 12 Ext C-band and 12 Ku-band Transponders, with similar configuration of GSAT-16, to improve upon the realization schedule to replace the end of life satellites INSAT-3C and INSAT-4CR at 74 deg. East orbital slot. GSAT-14 with 6 Ext C-band and 6 Ku Band transponders was in orbit with expected end of life till Sep, 2027. The additional 6 transponders on GSAT-18 overlapping with GSAT-14 were planned to provide continuity of service from Sep, 2027 till end of life of GSAT-18 i.e. Nov, 2032."

3. When asked whether the Department have taken note of the audit observations which states that the expenditure incurred towards the realization of hardware for these six Extended C Band transponders and its external launch service cost was avoidable and to state their response, if any, the Department in their written reply stated:-

"The expenditure incurred towards 6 Ext C-band transponders on GSAT-18 was not avoidable. These transponders were required to provide continuity of service and continued occupancy of orbit-spectrum in Ext C band after the end of life of GSAT-14. As per the ITU Radio Regulations, non-occupancy beyond three years leads to losing the priority to use the spectrum at that orbital slot. Hence, it was a conscious decision to carry these transponders on GSAT-18."

4. When asked whether the Department have taken or proposed steps to fix the accountability for causing loss of the cost of the hardware which was ₹ 13.53 crore and its launch service cost which was ₹3.74 crore, the Department in their written reply stated as under:-

"Based on the clarifications to questions 1 & 2, the carrying of 6 Ext C band transponders on GSAT-18 was conscious decision and there was no loss on cost of hardware. Hence, the need for fixing the responsibility does not arise."

5. DoS intimated (Feb 2023) that the expected revenue in these five years is substantial and would be ₹ 117 crore. When asked to check upon claim of estimated revenue in the backdrop of audit's observation on avoidable expenditure

of ₹ 17.27 crore on hardware and launch services of GSAT-18 Satellite and to furnish details, the Department in their written reply stated as under:-

> *"The GSAT-14 expected end of life (EOL) is in Sep, 2027 and that of GSAT-18 is in Nov, 2032. Thus, the GSAT-18 would provide service 5 years more than GSAT-14. Considering 5 years of utilization of 6 transponders at the approved pricing of ₹ 3.9Cr/transponder/annum potential revenue is worked out as ₹ 117 Cr."*

6. On being asked how the Department concluded that the cost of deployment of additional six extended C Band transponders would be substantial, the Department in their written reply informed as under:-

> *"In the case of not carrying 6 overlapping Ext C-Band transponders on GSAT-18, it would have required to launch additional satellite to ensure continuity of service and occupancy of orbit spectrum, which would be substantial. For instance, the realisation of GSAT-14 with 6 Ext C-band and 6 Ku band transponders costed ₹ 110 Cr in Jan, 2014 apart from the launch cost. The budget Estimate of GSAT-14 is attached."*

7. When GSAT-18 with 12 transponders was launched, GSAT-14 with 6 transponders was in operation, rendering 6 transponders of GSAT-18 idle for time being. On being asked whether the loss of revenue has been calculated due to its idling and to furnish details thereof, the Department in their written reply stated as under:-

> *"At 74 deg. East orbital slot, where GSAT-14 & GSAT-18 are operational, the available spectrum in Ext C-band can accommodate 12 transponders. Accordingly the switching off of 6 transponders on GSAT-18 was necessary till the End of life of GSAT-14. The opportunity of revenue for these transponders would arise during the last 5 years of GSAT-18 mission life. By plan, the 6 transponders were to be kept off till end of life of GSAT-14, therefore the case of revenue loss does not arise. Further, these transponders provide redundancy to mitigate any in-orbit failure of operational transponders."*

8. When asked whether the Department found it economically prudent to launch an additional six extended C-band transponders as a replacement for the GSAT-14 satellite (launched in January 2014), which is expected to complete its operational life in 2027 and to provide supporting documents to substantiate this decision, the Department in their written reply intimated:-

> *"Launching of a satellite with only 6 Ext C Band transponders is not commercially viable, due to sub-optimal configuration and so far no such satellite was realised."*

9. On being asked to furnish reasons for not scheduling the replacement for GSAT-14 satellite to the end of its operational life in 2027 and about the guidelines in place at ISRO for planning the replacement of existing satellites and to provide a copy of the guidelines/ instructions/ practices in place to this committee along with supporting documents, the Department in their written reply stated as under:-

> *"Post Space sector reforms 10 in-orbit operational communication satellites including GSAT-14 were transferred to New Space India Limited (NSIL), a CPSE under Department of Space, effective from April 1, 2021. NSIL is mandated to own, manage and offer the capacity to users on commercial basis. Generally, plan of replacement of satellite is initiated 3 years before the end of life. NSIL is expected to plan the replacement satellite with appropriate payloads to meet the needs of users on sound commercial principles. DOS order on transfer of In-orbit satellites and Indian Space Policy-2023 are attached."*

10. When asked how do the Department respond to the observation of Audit that DoS could plan the placement of transponders in an optimized manner, and how far the Department agree that there was improper planning on their part and absence of requisite mechanism to anticipate the existing capacity which resulted in non- utilization of six transponders of GSAT-18, the Department in their written reply stated as under:-

> *"The planning of a communication satellite at a given orbital slot is made on technical inputs like availability of spectrum, coverage requirement, continuity of service (including spare capacity philosophy), configuration*

of satellite bus viz-a-viz no. of transponder that can be accommodated, mission life, lift-off mass envelop (a range of mass) of the launch vehicle, etc. The GSAT-18 configuration was finalized by a team of project experts lead by a Study Director. Further GSAT-18 proposal was reviewed and cleared by Standing Project Appraisal Committee (SPAC) before submission to Space Commission and Cabinet for final approval. From planning to realization of a satellite, there are multiple committees comprising of various domain experts to review and recommend the design, configuration, realization and operational aspects. Carrying of 6 additional Ext C band transponders on GSAT-18, was a technical and fiscal cautious decision and the calculated assessment involved in launching the satellite. This shows the proper planning and review mechanisms followed while realising and launching the GSAT-18 satellites."

11. As per Rule 70 (iii) of GFR 2017, the Ministry / Department is responsible for effective, efficient, economic and transparent use of its resources. Further, Rule 70 (ix) states that the Department shall take effective and appropriate steps to ensure to collect all moneys due to the Government and avoid wasteful expenditure. In this backdrop, what asked about the action taken to implement the said provisions of GFR in letter and spirit in view of the losses incurred in the instant case, the Department in their written reply informed as under:-

"Department is making all the efforts to comply with provisions of GFR-2017. Based on the clarifications furnished above, conscious decision was taken to carry additional 6 Ext C band transponders on GSAT-18 to provide continuity of services and to protections of orbit-spectrum resources, beyond end of life of GSAT-14. Hence, the Department submits that there was no wasteful expenditure in the instant case."

Part II

OBSERVATIONS AND RECOMMENDATIONS

Introduction

After gleaning through all the information, collated by the Committee and sifting the same the Committee has come to certain recommendations which are brought out in the succeeding paragraphs of this Report.

The Committee find that Government of India sanctioned ₹ 1022 crore for the development of GSAT-18 satellite in May 2015. The Satellite with 48 transponders (24 C Band, 12 Extended C Band and 12 Ku Band) was launched on an urgent basis in Oct 2016. To meet the immediate requirement of protecting the existing users/ services of INSAT-3C in its C and Extended C Band and INSAT-4CR in its Ku Band since the satellites were reaching their end of life in Nov 2016 and June 2019 respectively. The Committee further note that the existing VSAT services of Extended C Band Transponders of INSAT-3C Satellite were to be shifted to GSAT-18 Satellite. Consequent to the launch of GSAT 18, the Committee find that it replaced 24 C band transponders and 6 extended C Band transponders of INSAT 3C and balance, six extended C-Band transponders of GSAT-18 satellite were not put to use since its launch as these transponders were already available in GSAT-14 satellite. The cost of the hardware was ₹13.53 crore and its launch service cost was ₹3.74 crore (totaling ₹ 17.27 crore) which, in the opinion of the Committee could have been avoided.

Recommendation No. 1

From the audit finding, the Committee note that six extended C-Band transponders of GSAT-18 satellite were not put to use since its launch as these transponders were already available in another satellite GSAT-14. Further, the expenditure incurred towards the realization of hardware for these six Extended C Band transponders and its external launch service cost to the tune of Rs. 17.27 Crore was avoidable. Thus, due to improper planning and absence of any mechanism to anticipate the existing capacity has resulted in a situation where six Extended 'C' Band transponders of GSAT-18 have been lying unutilized since its launch in 2016. The Committee are dismayed to learn from the reply of the

Department of Space that the said six Extended C –Band transponders would be utilized to replace the same in GSAT-14, after its end of life in 2027 till the expected end of life of GSAT-18 in 2032. The expected revenue during these five years is substantial amounting to ₹117 crore. The Department of Space further added that the cost of deployment of additional six extended C Band transponders after the end of life of GSAT-14 satellite (September 2027) in a separate satellite to provide continuity of services would be substantial. Assuming GSAT-18 did not carry these additional 6 Ext C band transponders and these transponders were to be carried on a separate satellite for providing continuity of service, the expenditure would be much higher towards building the satellite and launching it. From the replies furnished by the Department of Space in response to the audit findings, the Committee observe that there has been lack of dredging commitment on the part of Department of Space. The Committee are unable to understand as to how it would be economically viable to keep six Extended C-Band transponders idle for 11 years for the sake of utilizing for a period of 5 years and within five years as per New Space India Limited (NSIL) guidelines, its replacement has to be initiated before 3 years of its end of life. In view of above, the Committee recommend the Department to be more cautious and economically prudent while planning projects involving substantial amount of public money.

<u>Recommendation No.2</u>

The Committee further infer that Extended C band spectrum available at 74-degree East orbital slot can accommodate only 12 transponders for services over India. When GSAT-18 with 12 transponders was launched, GSAT-14 with 6 transponders was already in operation from January, 2014, rendering 6 transponders of GSAT-18 idle for long period of 11 years. The Committee note that GSAT-14 satellite has a total of 12 transponders including six Ku Band and six Extended C band and would need continuity after its life in 2027. The Committee find that due to improper planning and absence of any mechanism to anticipate the existing capacity resulted in a situation where six transponders of GSAT-18 are lying unutilized as pointed out by Audit. Gleaning through all the information and facts available in the matter, the Committee desire to be apprised of the palpable reasons for not scheduling the replacement for GSAT-14

satellite to the end of its operational life in 2027 as per guidelines/ instructions/ practices in place at ISRO i.e. 3 years before its end of life.

Recommendation No.3

While examining the subject, the Committee find that the Department of Space launched GSAT-18 in October 2016 on an urgent basis through a procured launcher to meet the immediate requirement of protecting the existing users/ services of INSAT-3C in its Extended C Band since the satellite was reaching its end of life in November, 2016. The Committee are surprised to note that the Department launched replacement for INSAT-3C with end of life in November 2016 in October, 2016. At the same time, for replacement of six Extended C-Band transponders of INSAT-14, with its end of life in 2027, was launched in October 2016 for its actual use from 2027 to 2032. The Committee would like to be apprised of the maintenance /service cost, if any, being incurred by the Department for its idle period of 11 years from 2016 to 2027.

Recommendation No.4

The Committee note that launch service costs are typically calculated on a per-kilogram basis of payload. The response of the Department of Space that in order to deploy an additional six extended C-band transponders on a separate satellite after the end of GSAT-14's life *i.e.* in September, 2027 would incur substantial cost. In this regard and at this stage the Committee can only recommend that they be apprised in detail in regard to the basis on which the claim is made by the Department.

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NEW DELHI:
25 March, 2025
Chaitra 4, 1947 *(Saka)*

K.C. VENUGOPAL
Chairperson,
Committee on Public Accounts

APPENDIX-I

MINUTES OF THE SIXTEENTH SITTING OF THE COMMITTEE ON PUBLIC ACCOUNTS (2024-25) HELD ON 25 MARCH, 2025

The Committee on Public Accounts sat on Tuesday, the 25 March,2025 from 1000 hrs to 1030 hrs in Room No. 51, Hon'ble Chairperson's Chamber, Samvidhan Sadan, New Delhi.

PRESENT

Shri K.C. Venugopal - Chairperson

Members

LOK SABHA

2. Shri T. R. Baalu
3. Shri Jai Parkash
4. Shri Ravi Shankar Prasad
5. Shri C. M. Ramesh
6. Shri Magunta Sreenivasulu Reddy
7. Smt. Aparajita Sarangi
8. Dr. Amar Singh
9. Shri Tejasvi Surya
10. Shri Anurag Singh Thakur

RAJYA SABHA

11. Shri Shaktisinh Gohil
12. Dr. K. Laxman
13. Shri Tiruchi Siva
14. Shri Sudhanshu Trivedi

LOK SABHA SECRETARIAT

1. Dr. Sanjeev Sharma - Joint Secretary
2. Shri Muraleedharan. P - Director
3. Shri Alok Mani Tripathi - Deputy Secretary
4. Shri Pankaj Kumar Sharma - Deputy Secretary
5. Shri Atul Bhave - Deputy Secretary
6. Smt. Malvika Mehta - Deputy Secretary

REPRESENTATIVES OF THE OFFICE OF THE COMPTROLLER AND AUDITOR GENERAL OF INDIA

1.	Dr. Kavita Prasad	-	Director General
2.	Shri Ashutosh Sharma	-	Director General
3.	Shri Samar Kant Thakur	-	Director General

At the outset, Hon'ble Chairperson welcomed the Members and Officers of the office of C&AG of India to the sitting of the Committee. Thereafter, Hon'ble Chairperson stated that the following three draft reports may be taken up for consideration and adoption:-

(i) XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX;

(ii) Draft report on **"Sub optimum utilization of the capacities of GSAT-18 Satellite"** based on Para 2.2 of C&AG Report No. 24 of 2023; and

(iii) XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX.

2. After some deliberations, the Committee adopted the aforesaid Draft Reports with some modifications in the Report at Sl. No. (i) and authorised the Chairperson to finalise the Reports in the light of factual verification done by the Audit.

The Committee then adjourned.