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Government of India
Department of Space

Antariksh Bhavan,
New BEL Road,
Bengaluru

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Subject: Revised Technology Transfer Policy Guidelines 2020 – Seeking public comments - Reg.

Department of Space (DOS) being the administrative ministry in respect of space activities in India as per the allocation of Business Rules of Government of India shall issue appropriate guidelines from time to time, for transfer of technologies developed using ISRO resources over the years to Indian industries (both public & private sector), for the benefit of the public and development of nation.

Accordingly, a copy of Revised Technology Transfer Policy Guidelines 2020 is hosted in this website for public consultation.

Comments on the policy, if any, shall be forwarded to this Department to the email id: dir.projects@isro.gov.in at the earliest , but not later than 23rd December 2020.

TECHNOLOGY TRANSFER POLICY AND GUIDELINES (2020)

DEPARTMENT OF SPACE



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1.0 SCOPE

This document sets down the broad approach of ISRO, Department of Space, to the mechanism of transfer of technologies, developed by its centres/ units under a policy framework for DOS-Industry cooperation. It also elucidates the principles and guidelines to be adopted by DOS/ ISRO in estimating the technology development cost.

2.0 PREAMBLE

Technology transfer is the process by which knowledge, intellectual property and capabilities developed at its centres/units and elsewhere, utilising ISRO's resources are transferred to external entities including industries in the public and private sector, academia and State / Central Government organisations. It is NSIL's mandate to actively pursue technology transfer so that benefits of the space programme are transferred to Indian industries, both public and private sector.

Initiated in early 1970's, the technology transfer scheme in DOS has evolved into a mature programme involving close cooperation with Indian industries resulting in transfer of a significant quantum of technologies for commercialisation and also in development of meaningful "spin offs" resulting in innovative products.

There is no sure-fire general algorithm or formula for successful technology transfer. While this activity has to be circumscribed by broad organisational policy and guidelines on pricing and selection of licensees and must be progressed in line with DOS main objectives in technology transfer of "spin offs", each case is unique in its own way.

3.0 OBJECTIVES OF TECHNOLOGY TRANSFER PROGRAMME

The Indian space programme has grown from its modest beginning of experimental satellites and launch vehicles to a full-fledged operational programme fully capable of building satellites and launch vehicles for various requirements. Having invested significant resources, the Indian space programme is required to maximize the transfer of technologies generated in various areas to Indian industries, thereby contributing towards technological self-reliance, industrial growth and national development. Recognising the potential for space programme to generate multiplier effect in terms of returns to industry and economy at large, from long term investments made, it was realised that "spin off" or fall out returns and their multiplier effect could be many times the direct returns from investment in mission-oriented high technology programmes such as space technology.

Unless these programmes disseminate the fruits of their enterprise to various sectors of the economy and generate mechanisms for effective transfer, the returns to the nation as a whole would remain limited and a synergistic impact would not occur. The primary objective in the transfer and dissemination of Government generated technology to industry and other sectors is the speedy growth of the industries and the consequential momentum to sustained national development. Dissemination of best manufacturing and quality practices adopted by DOS to Indian industries and participation in technological and industrial development in high-technology areas are some of the direct benefits of DOS technology transfer program. The direct revenue returns to DOS/ISRO from the process of technology transfer are relatively minor and of secondary importance.

4.0 SOURCES OF TECHNOLOGIES FOR TRANSFER

Technological advances in space technology are undertaken through advanced R&D programmes including in-house technology development projects or through various collaborative schemes with academic institutions of repute. Such avenues are often a potential source for development of new and novel technologies that may be exploited by the industries. Developmental projects as well as ISRO academic interface activities manifests itself in several new ideas, systems, hardware, equipment, processes and technologies etc.

4.1 IN-HOUSE R&D PROGRAMME

The avenues of technology generation may include:

- DOS/ISRO's in-house projects, R&D and Technology Development Project (TDP) activities in the areas of satellites, launch vehicles, sensors, ground segment, space applications, space and atmospheric sciences;
- Technology utilisation at Industry by means of contracts/orders placed for fabrication and supply;
- Sponsored Research carried out at academic institutes including chairs of research set up at IITs and other institutes of repute;
- IPR portfolio of DOS/ISRO consisting of patents, copyrights and trademarks;
- Joint development work and collaboration carried out with industrial partners.

It is to be noted that while these programmes are very often a rich repository of technologies and products, however they may require specific customisation efforts for meeting the needs of market. R&D programmes are undertaken for meeting the programmatic goals and are entirely motivated, approved and funded to fulfil the goals and targets of the space programme and its projects. The subsequent deployment of such R&D results, for non-space applications (spin offs), with or

without modifications, is naturally a secondary and incidental albeit activity of the programme. The technologies developed herein are expected to be in various stages of development and may require additional customisation efforts in terms of scaling, prototype development, qualification and testing for meeting the needs of market. Industries interested in such technologies, may be encouraged to maximally participate in the activities right through development, qualification and testing leading to successful productionisation.

4.2 JOINT DEVELOPMENTAL WORK AND TECHNOLOGY UTILISATION WITH INDUSTRY

DOS, for advancement of its programmes utilises the service of industries for procurement of products and fabrication services, utilisation of industries R&D capabilities and infrastructure and combination of these approaches. Very often, there is significant exchange of information in terms of specification, drawings, designs, software, technology, programs, data, process technique etc. It is essential that DOS/ ISRO centres/units shall ensure that technology elements are addressed appropriately in procurement / fabrication works, contracts, MoUs, joint development work and agreements for which there is a commercial potential.

It is essential that this arrangement is documented in a form which at a minimum substantiates the relationship between DOS/ ISRO and industry. An important consideration is the background technology and the ownership of any intellectual property rights and technologies arising out of the development work. The joint development work shall anticipate the creation and transfer of technical know-how. In cases of collaboration with industry, ISRO centres/units shall ensure that a Non-Disclosure Agreement (NDA) is entered with the industry, that outlines confidential material, knowledge, or information that the parties wish to share with one another for certain purposes, but wish to restrict access to or by third parties.

In the case of DOS/ ISRO funded (either partly or fully) and initiated work with industry, including joint development work, technology utilisation efforts, fabrication orders etc, the rights of IPR and the technology arising out of such work shall be mutually decided by DOS/ ISRO and industry. Further, the joint development partner will be given the choice of first right of refusal for technology transfer, as a licensee. DOS, through NSIL, shall however retain its rights for additional licensing, based on market consideration.

4.3 ISRO SPONSORED RESEARCH AT ACADEMIA

ISRO's sponsored research programme (RESPOND), conducted jointly with reputed academic institutes like IIT's, IISc and other institutions aims at providing financial support for conducting research and development activities related to space science, space technology and space application. The ownership of any technology or IPR

developed as consequence of such programme shall be mutually decided before the initiation of such activities, either with partial or total funding, with or without intellectual involvement of DOS/ ISRO and this shall form the basis for ISRO initiating and leading technology transfer efforts. The terms and guidelines adopted for transfer will be in line with the standard terms and guidelines for technology transfer adopted by DOS/ ISRO. On a case to case basis, the terms including strategy adopted for technology transfer, licensing terms, choice of industry and revenue sharing may be decided after mutual discussions with the academic institute by the concerned DOS/ ISRO centre. Once the technology developed and ready for transfer, through approved technology transfer process, it will be transferred to licensee industry through NSIL.

5.0 IDENTIFICATION OF TECHNOLOGY AND ASSESSMENT OF TECHNOLOGY READINESS FOR TECHNOLOGY TRANSFER

One of the steps critical to success of technology transfer programme is the identification of technology that has a potential for commercialisation. DOS/ ISRO centres play a vital role in this process of identification of technology. Each centre may devise its own mechanism, provide suitable guidelines and define an organisational structure for this purpose. A dedicated Technology Transfer Cell (TTC) within the centre may be identified with laid down responsibilities for end to end coordination, both within the organisation, i.e., the inventors, quality and testing teams and the potential licensee to ensure successful commercialisation of technologies for maximal exploitation. While the centre may have its own structure for picking up the technologies, it must be ensured that such technologies maturity is assessed by rigorous screening process involving reliability testing, quality certification, repeatability in in-house usage and proven worthiness.

The eventual success/ failure of the technology transfer might have impact on ISRO's image. Therefore, the decision to admit a candidate to transferable technology should be based on test and evaluation results, quality certification etc. The assessment must focus on commercial viability and strategic considerations amongst other things as detailed below.

5.1 CRITERIA TO ASSESS TECHNOLOGY READINESS

The commercial potential of the technology is tied up to the value of technology i.e., its potential benefits, its advantages in the marketplace, and its impact on profitability of the licensee industry. Several essential technical, market and intellectual issues must be addressed while assessing the value. Secondary sources of information (e.g. published data, market research reports, internet searches) and primary sources must be evaluated. Primary sources include

inventors, experts, end users and potential licensees. Expert can also be found in industry and academia.

The technology so identified shall be critically assessed as per the following criteria:

- The readiness of the technology for transfer, i.e. ensure that all bugs upto prototype stage have been ironed out
- Development status of the technology and its proven / repeatable usage in in-house activities
- Its chances of success in the likely recipient organisation, and
- The socio economic or commercial viability, as the case may be, of the product or process.

The assessment must also focus on commercial viability and strategic considerations amongst other things, considering the following questions:

- Does it make a product that is better than existing technologies?
- Is someone willing and able to develop and build and someone willing to buy the end product and will both realise increase value?
- Is the technology been successfully demonstrated as an advanced prototype? If the innovation is merely a concept, the prospective technology adopters may not give it much credence.
- Can the technology be developed into a product that meets a substantiated need?
- Have companies been identified that can and will take the technology from its current stage of development to a commercial product?
- Can adopting companies commercialise the technology at a cost and price that will provide acceptable return on investment?
- Have sufficient end users been identified that not only need the innovation but are willing to pay acceptable price?
- Does the technology add value throughout the supply chain?
- Is the technology important from strategic considerations like import substitute, etc?

DOS/ ISRO centres/ units may utilise the services of interns from management institutes and conduct market survey on technologies that have potential for technology transfer.

6.0 TECHNOLOGY TRANSFER ORGANISATION AT ISRO

6.1 Technology Transfer Group (TTG)

The technology transfer activities shall be organised through a centralised Technology Transfer Group (TTG) Office under CBPO operating from ISRO HQ, Bangalore. Such centralised office shall interface with all DOS/ ISRO centres through centre level Technology Transfer Cell (TTC) for all day to day activities

concerning technology transfer. TTG is responsible for getting the TT proposals reviewed by Centralised Technology Transfer Committee (CTTC) and ensure adoption of uniform policy across all ISRO centres to arrive at TT development cost. TTG shall interface with Department of Space for policy level decisions and obtaining approvals from Secretary, DOS. It is also responsible for coordinating with the DOS/ ISRO centres / units, in encouraging, guiding and supporting Technology Transfer activities at the centre/ units.

6.2 Centralised Technology Transfer Committee (CTTC)

This is a Centralised committee at ISRO level constituted by Secretary, Department of Space, responsible for reviewing the proposals submitted by TTG. The committee shall be constituted by Secretary, DOS and will have members from TTG-CBPO, NSIL, DOS, ISRO centres. The committee inter alia finalise the Technology Development Cost, Technology Transfer (ToT) Cost, etc.

6.3 Technology Transfer Cell (TTC)

Technology Transfer Cell is at centre level, will consist of technology managers and engineers who will be the focal point of contact with industry for technology transfer and hand holding. The TTC shall have overall responsibility of identifying the technologies, developing the Technology Transfer Document (TTD), estimating technology development cost, conducting review meeting and forward the proposal along with the technology transfer document to TTG, CBPO, ISRO HQ. The proposal prepared by TTC shall be sent to TTG after obtaining the approval of Director of the ISRO centre.

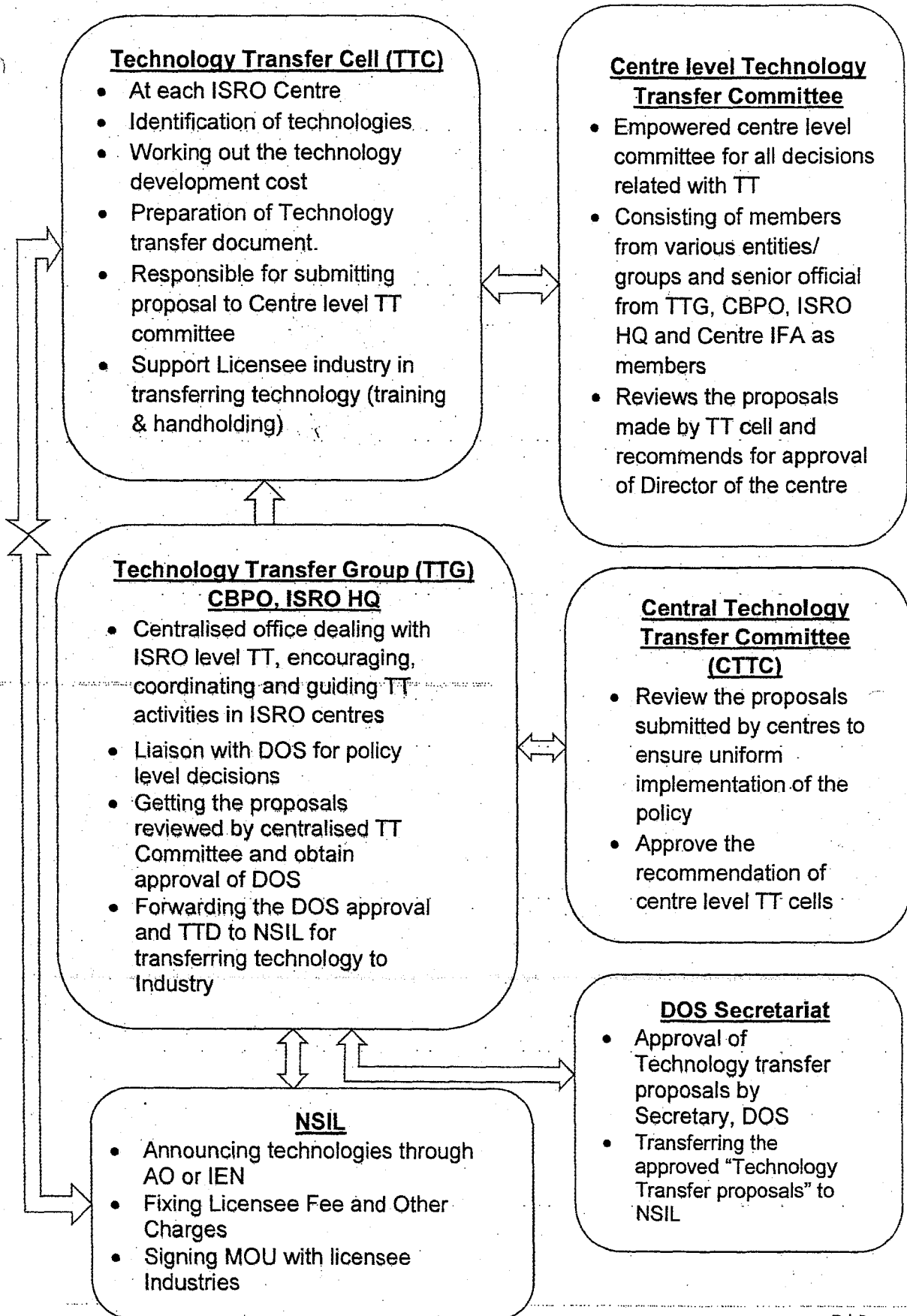
6.4 Centre level Technology Transfer Committee

An integrated centre level committee with a Deputy Director as Chairman, representatives from entities, Internal Financial Advisor (IFA) and with Technology Transfer Cell focal point as its convener shall be constituted by the Director. One senior official from TTG, CBPO, ISRO HQ shall be a member of this committee.

6.5 NewSpace India Limited (NSIL)

NSIL has been mandated for commercialising the technologies developed by DOS/ ISRO. The technologies that are approved for transfer by DOS will be transferred to NSIL through an internal agreement/ MOU between DOS and NSIL. This would enable NSIL to transfer the technologies to licensee industry(ies) with a technical support extended by ISRO towards handholding and training the industry for ensuring the technology transfer. NSIL will fix the Licensee fee and other charges as per NSIL company guidelines.

6.6 TECHNOLOGY TRANSFER WORK FLOW



7.0 COSTING GUIDELINES

The costing for technology transfer shall be carried out as per the guidelines evolved by ISRO in this regard. The costing guidelines for technology transfer is provided in *Enclosure to this document*.

8.0 MOTIVATION AND ORGANISATIONAL INCENTIVES

It is recognised that technology transfer activities are incidental to ISRO activities and albeit significant and important component of ISRO's programmes. However, development of technology per se, and its subsequent licensing is a challenging and daunting task involving several processes, i.e., detailed documentation, ensuring absorption of technology by licensee industry, continuous handholding support to industry during entire process of technology absorption, setting up and subsequently assisting the licensee in gainful productionisation and its product marketing. All of this requires dedicated efforts, self-driven enthusiasm and a burning desire for success. Hence, it is essential to motivate and recognise the efforts of ISRO Scientist/Engineers towards technology transfer activities. Adequate recognition in the form of incentives and / or awards for successful technology transfer cases at ISRO centre/units shall be encouraged. ISRO Scientists/ Engineers shall be motivated to take up technology transfer activities in addition to regular project activities they are currently engaged in.

9.0 TECHNOLOGY TRANSFER: SPECIAL CASES

9.1 TECHNOLOGY TRANSFER THROUGH INCUBATION

Processes and prototypes developed in the laboratory need an extra development or scale up to be successful in the market. This specific customised development could take place with the help of interested industry under the guidance of a concerned Scientist/ Engineer. ISRO centres shall facilitate incubation efforts and decide on modalities, on a case to case basis. First right of refusal for technology transfer shall be given to industrial partner collaborating with ISRO. Department of Space shall decide on the incubation opportunities for start-ups and MSMEs either through DOS/ ISRO supported or encouraged Incubation centres.

9.2 TECHNOLOGY TRANSFER TO ENTREPRENEURS

NSIL as a policy decision shall not transfer its technology to an individual. An individual, who is desirous of starting a new business or setting up an industry with ISRO technology must get the firm registered as per the provisions of law. However, in such cases, flexibility shall be shown while evaluating the technical,

managerial, infrastructure and financial strength of the industry. Reasonable time shall be provided for realising technology absorption and productionisation.

9.3 TECHNOLOGY TRANSFER FOR SOCIETAL APPLICATIONS, NON GOVERNMENTAL ORGANISATIONS (NGO's), NON PROFIT ORGANISATIONS (NPO's) AND COMMUNITY BASED ORGANISATIONS (CBO's)

NGOs, NPOs and CBOs and other similar entities play an important role in development of weaker sections of community as well as service delivery in local and rural areas. There may be instances of "spin off" technologies from DOS/ISRO, which may have wider societal applications. In these cases, there shall be no ToT cost payable by NSIL to DOS. NSIL on a non-exclusive basis shall transfer the technologies to NGOs/NPOs/CBOs with suitable rebates in licensing fee/ royalty. Such decisions may be taken by NSIL appropriately. However, NSIL may not commit any funding or investment from its side for successful application of such technology.

However, standard terms of technology transfer/ licensing shall be applicable to industries showing interest in ISRO technologies having societal applications with commercialisation as end interest.

9.4 DUAL USE TECHNOLOGY / RESTRICTIVE TECHNOLOGY

Considering the potential implication and security concerns in licensing the dual use technology, NSIL shall take utmost precaution and care for selection of prospective licensees for such technology transfers. While the licensing can follow the norms prescribed above, NSIL need to exercise adequate precaution in terms of regular follow ups and maintaining correspondence to ensure that technology is utilised for the purpose it is meant for. During the licensing of technologies having dual use potential, centres shall make the NSIL and licensee understand the concept of dual use and the basic export control regulations, including end-user and end-use based controls. Recipient of technology should ensure that adequate norms stipulated by Government of India for export of dual use technology is followed and appropriate clearances obtained. Whenever dual use or restrictive technologies are being offered for transfer, the category shall be clearly indicated in the formal communication to NSIL mentioned in para 6.4

9.5 FOREIGN ACCESS TO ISRO TECHNOLOGY TRANSFER

The technology transfer activities of DOS are primarily intended for the domestic utilisation of DOS/ ISRO developed technologies by Indian industries. However, in the context of liberalisation and globalisation, requests from foreign organisations for transfer of DOS/ ISRO developed technologies shall be

encouraged as per the guidelines issued by Government of India. However, such request shall be reviewed and processed on a case to case basis and the term of licensing shall be arrived at considering the merits of organisation, intellectual value of the technology and its commercial potential etc. In cases, where foreign enquiries are related to a product for technologies already licensed, such enquiries may be referred to authorised licensee industry. However, insofar as a technology transfer from NSIL to foreign organization/ industry is concerned, such requirements shall be dealt on a case to case basis, with necessary approval of Ministry of Commerce through DOS.

9.6 SOFTWARE LICENSING

The terms for licensing of software shall be arrived by NSIL in consultation with software experts from ISRO/ DOS. Terms of software licensing shall be decided on a case to case basis without involving the source code of development.

COSTING GUIDELINES FOR TECHNOLOGY TRANSFER

1.0 INTRODUCTION

One of the important inputs for decision making on the pricing of items to be offered for commercial exploitation of the technologies from ISROs space related research and development activities is the cost associated with developing and transferring such technology. The nature of activities in DOS/ ISRO Centres/ Units is not specifically geared to solve the specific problems in specific industries but only to make available any serendipitous discoveries that are likely to be of industrial/ commercial use.

The direct revenue returns to Government of India from the process of technology transfer, through license fees, royalties etc are relatively minor and of secondary importance. Technical considerations and economic factors like competitive conditions, potential market size, etc are much more decisive factors for successful technology transfer. Technology development and transfer is fraught with considerable risks and the failure rates are quite high. It is very difficult to persuade industries to share these risks either by sharing development costs or by agreeing to royalty rates that generate some surplus to the development agency.

In ascertaining the costs associated with manufacture of a prototype/ pilot production of the items identified for technology transfer, many aspects of the cost ascertained have to be necessarily based on the estimates. It is emphasized that effort here is to conceptually provide for the development cost on an equitable basis rather than spending too much time and effort in ascertaining the costs by adopting rigorous costing techniques.

With a view to have uniformity in the matter of estimating the cost incurred for the purpose of technology transfer, following guidelines are recommended.

2.0. MARGINAL COST

One of the important guidelines to be followed is that the cost estimated shall be the "marginal costs" of the development and/ or technology transfer activities. These

marginal cost by definition relate to such items of expenditure which would not be incurred had not the particular activity been undertaken.

The objective shall be to assess the cost that can be directly attributable to the activity and not load it with indirect overhead costs, which have been incurred and will continue to be incurred regardless of the particular activity in the DOS/ ISRO Centres/ Units.

In case of costs where relevant Purchase Orders and other details are not available, an engineering estimate in consultation with concerned Head, Accounts & IFAs of the DOS/ ISRO Centre will be made.

3.0 IDENTIFICATION OF SUBSYSTEMS OF AN ITEM OF TECHNOLOGY TRANSFER

It is often possible that for the item developed, the technology transfer to a particular party may be done either for the item as a whole or for the various subsystems comprising of the system. In certain cases, the transfer of technology may be effected only for an identified subsystem of an item developed by DOS/ ISRO. It is therefore essential that while estimating the cost, this possibility is always kept in view so that arbitrary apportionment of costs at a later date can be avoided / minimised.

The elements of cost for technology transfer shall include:

- a) Direct Material/ Components (indigenous and imported) cost
- b) Direct staff costs
- c) Equipment usage cost
- d) Fabrication expenses
- e) Travel and logistic expenses
- f) System / Sub system level testing expenses
- g) Other direct costs not included in the above categories
- h) Intellectual cost

4.1 DIRECT MATERIAL COST

- a) The direct material cost shall be estimated keeping in view the quantity of materials required for the developing/ manufacturing a particular item.

- b) The estimates of the quantity shall take into account the estimated wastages that are likely to arise while developing/ manufacturing the item during its different stages and also the rejections likely to occur due to inter stage and final inspections.
- c) Where, for developing / supplying a particular item, the suppliers of the material stipulate a minimum quantity for supply, then this factor should be kept in view while finalising the cost estimate for that item
- d) As regard to the costing of the direct materials:
- the developing/manufacturing groups/ division/ facility/ entity shall indicate the latest prices from copies of Purchase Order available with them;
 - if the purchases have not been made recently and materials have to be procured specially for this purpose, then market rate should be ascertained wherever possible. Otherwise the last purchase rate should be suitably updated keeping in view the general rises in the price. 7 to 10 % escalation may be added in case purchases are not made recently (i.e. older than 3 years).
- e) The prices to be adopted shall be F.O.R DOS/ ISRO Centre/Unit, however where purchases are effected ex works of the supplier, then the freight and incidental expenses shall be calculated at actual. However, in absence of such details, 5% should be added towards freight and incidental for the indigenous items and 7% for imported items for the Ex Works / FOB price.
- f) While estimating the quantity of materials, components, etc required provision for wastage (3%) and for rejection (2%) may be taken into account.
- g) Taxes / Duties are extra and shall be appropriated / adjusted accordingly.

4.2 DIRECT STAFF COST

- a) It should be possible to estimate in a realistic manner the direct staff costs associated with the development / technology transfer of the item concerned, as the identification of the personnel associated with the development/technology transfer of the item should not at all be a difficult task
- b) Staff shall not ordinarily be treated as direct staff unless they are exclusively associated with the development of item concerned.
- c) Where the staff is involved in multiple projects, their efforts in development must be appropriately apportioned by the concerned Division Head.
- d) The direct staff shall be grouped under the following categories:

Technician	Technician B, D, E, F, G
Sr. Technician	Sr. Technician A, B
Scientific /Technical Assistants	Scientific / Technical Assistants in all categories
Engineers	Jr. Engineer , Asst. Engineer
Scientists/Engineers	Engineers from category SC to SE

Scientist / Engineer-SF and above shall not ordinarily be treated as direct staff unless they are exclusively associated with the development of the item concerned.

e) The manpower cost shall be worked out for technical personnel by using the middle pay of the time scale and allowances applicable. The actual may be worked out considering the scale of pay of scientist, grade pay, current allowances and location of DOS/ISRO centre.

f) The following procedure will be ordinarily followed for the calculation of direct staff component:

- The salary per year of the staff will be calculated taking into consideration the Basic Pay drawn, Dearness Allowance, and any other pay as part of salary, House Rent Allowance, Transportation Allowance and PRIS (variable incentive).
- In addition to that 100 % overheads towards organisations approximate liability towards each employee in the form of Pension Contribution, Gratuity, LTC, Leave Salary Contribution, Group Insurance Scheme, Professional Update Allowance, CHSS, Canteen Subsidy, PRIS, Management Expenses like training, workshop, seminars and other expenses needs to be calculated.

The following will be the basis of calculation of annual working hours :

- The per year salary of the staff involved in development of the technology will be calculated.
- After ascertaining the per year salary, the direct staff per hour rate will be calculated, as follows:

Per hour salary = Salary Per Year / 1680 hours

Total number of days in a year		365
Less: Saturdays & Sundays – 2 days in a week x 52 weeks	104	
Casual Leave during the year	10	
Earned Leave during the year	30	
Public holidays in a year	11	155
Active working days in a year		210
Active working hours in a year : 210 x 8 hours		1680

- g) Technology Transfer Division officials at the concerned ISRO Centres/Units in consultation with the Scientist in Charge of the project shall estimate the man-days and man-hours of each staff directly involved in the project, so as to arrive at the total number of manhours spent in the development/ technology transfer of the item.
- h) The actual rates and percentages applicable as per rules in force from time to time, shall be adopted in consultation with Head, Accounts & IFA of the Centre/ Unit.
- An illustrative example for the calculation of a sample manpower cost is enclosed in the *Appendix A*.

4.3 EQUIPMENT USAGE COST

- a) Normally, the existing equipment in DOS/ ISRO is used for the development of the item in the ISRO centre/unit.
- b) However, if for any particular item, specific purchase of the equipment is resorted to, then the cost of such equipment should be ascertained from relevant Purchase Order and treated as the cost of development of item.
- c) If the equipment purchased so will be used in DOS/ ISRO Centres/units for other activities, then instead of full value of the equipment, a prorated cost shall be worked out in consultation with IFA and treated as development cost rather than full cost such equipment.
- d) In case of existing equipment, an effort should be made to ascertain the cost of utilising such equipment, only if such usage is significant. The concerned Divisional/Group head shall decide if usage of such equipment is significant or not.
- e) In case the usage is significant, the associated annual cost of running/operating the equipment shall be ascertained.
- f) Depreciation element will be computed normally on the basis of a three year life for computer systems/software, five year life for electrically operated/electronic equipment, and ten years for mechanical/chemical plants and other machinery and equipment.
- Depreciation cost : Capital Cost of Equipment / Estimated Life of Equipment*
- g) In case of machines/equipment having a normal life other than the above or having outlived projected life estimate, the depreciation factor can be fixed in consultation with Centre IFA.

h) After ascertaining such annual costs (including depreciation) associated with the use of the machine, the per hour machine usage rate shall be calculated. This will be arrived at considering 1680 working hours in a year.

Per hour equipment usage cost : Annual usage cost of machine / 1680 hours

i) The number of hours of usage of the machine for tech. transfer / development will be specified by concerned Division Head and subsequently the equipment usage cost will be arrived.

Equipment usage cost : Per hour equipment usage cost X no. of hours of Machine usage

j) It should be emphasized here that effort here is to conceptually provide for the utilisation costs of the equipment on an equitable basis rather than spending too much time and effort in ascertaining the costs by adopting rigorous costing techniques like machine hour rate etc.

Sl. No	Description	Value	Basis for estimation
1	Capital cost of equipment	Rs A	Purchase Order Available with Purchase/Accounts
2	Annual Costs		
2.1	Power / fuel	Rs	Estimated based on the machine capacity rating
2.2	Operators wages / supervision	Rs	Engineering estimate
2.3	Consumable like coolant lubricants etc.	Rs	
2.4	Tools required etc.	Rs	
2.5	Repair / overhaul charges	Rs	
2.6	AMC Cost	Rs	
2.7	Other direct charges running machine, general lighting / air conditioning costs etc	Rs	
2.8	Total recurring cost (2.1 to 2.7)	Rs	
3	Depreciation cost: Capital Cost of Equipment (A) Estimated Life of Equipment	Rs	Calculated at Percentage of the Capital cost A Considering the estimated life of the equipment
4	Total Annual Cost (2.8 + 3)	Rs B	
5	Equipment usage cost		
5.1	Per hour equipment usage cost (X)	Rs B/1680 hr	
5.2	No of hours of Equipment usage for development and or tech. transfer	Y hours	To be specified by Division Head

5.3	Equipment usage cost: Per hour equipment usage cost X no. of hours of equipment usage (X * Y)	Rs.	
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An illustrative example for the calculation of a sample equipment usage cost is enclosed in the *Appendix B*.

4.4. FABRICATION EXPENSES

Often, due to reasons such as non-availability of internal facilities etc, the fabrication work is contracted to an outside agency. In such cases, Purchase Order/ Fabrication orders are placed by concerned DOS/ ISRO Centre. The total expenditure incurred on fabrication shall be ascertained and classified as fabrication expenses.

4.5 TRAVEL AND LOGISTIC EXPENSES

Expenditure of the concerned Scientists/ Engineers and other staff in travel associated with the purpose of technical discussions, testing, demonstrating the prototype, training the personnel from the recipient organisation etc are usually incurred in the development / technology transfer. The estimates shall be done on a realistic basis.

4.6 SYSTEM / SUB SYSTEM LEVEL TESTING CHARGES

At times it becomes necessary to incur expenditure on outside test facilities for testing the subsystems/ items developed. In such cases, the testing charges which has been billed by facility to the DOS/ ISRO centre would be available and the same shall form the basis of estimating the test expenses.

In case test facilities within other DOS/ ISRO centres are used or where billing details are not available, then an engineering estimate of the testing charges shall be made by the Division Head to assess the testing expenses. The component of system/ subsystem shall be decided by Division Head.

4.7 OTHER DIRECT COSTS

Normally all the items of direct costs associated with the development/ technology transfer would be capable of being classified in one or other various classifications given above. However, it is possible that in the case of certain items there are certain

elements of cost which are directly attributable to the development / technology transfer but not falling in any of the classification of costs given above. The cost of development expenses incurred by placement of developmental orders on industry etc can be classified under this.

Reasonable estimates of such costs shall be made. The basic effort is to estimate the direct costs of development/ tech transfer in a realistic manner on a case by case basis and hence the above classification of costs should in no way be construed as restricting the scope of estimating the direct costs associated with development / technology transfer of a particular item.

4.8. INTELLECTUAL COST

There is a certain amount of Intellectual value associated with any development. A considerable effort from the inventor is required for the generation of a useful product/ process from an idea. Considering this, an element of intellectual cost must be added. Intellectual cost may be fixed in consultation with the concerned Development Team / Division Head with the approval of Centre Director. This can be notional and can be 5% of the development cost estimated using the above guidelines.

5.0. COST REPORT

Action to estimate the cost of an item for development / technology transfer should be taken immediately when it is anticipated that a technology from R&D activity could result in a transfer of technology for industrial / commercial use,

The cost report will be prepared by adding all the above costs 4.1 to 4.7, on a year wise basis. 5 of the above cost will be added as Intellectual cost. The total cost so determined will be known as the Marginal Development Cost for Technology Transfer.

The responsibility for the estimation of development cost will rest with the Centre level technology transfer division in consultation with the concerned technology development team. The Head, Accounts & IFA of the centre will be consulted while estimating this cost. The final cost report will be vetted and approved by the Head, Accounts & IFA of the ISRO Centre.

A template of cost report is enclosed as *Appendix C*.

CALCULATION OF DIRECT STAFF COST**A. GROSS SALARY PER MONTH**

Staff Category : Scientist / Engineer-SD		
Basic Pay ale : Rs. 76.200 (with 5 increments)		
Sl.No	Description	Pay in Rs
1	Basic Pay	76,200
2	Dearness Allowance (@21% of Basic Pay)	16,000
4	HRA (@ 24% of Basic Pay) Assumption : Employee based at Class A cities	18,288
5	PRIS @40%	30,480
6	Transport Allowance incl. DA @ 21%	8,712
	Gross Salary per Month (Sl.No 1 to 7)	Rs 1,49,680

B. Other benefits charged on gross salary:

Description	% of Gross Salary
Leave salary contribution	10
Pension contribution	10
Gratuity	10
GIS	5
Professional Update Allowance, Management expenses like Training/ Workshop/Seminars and other expenses	40
LTC	10
CHSS	10
Canteen subsidy	5
Total	100

C. Direct Staff Cost per month : Rs 2,99,360

(Gross salary + 100 % Overhead)

D. Direct Staff cost per year : Rs 35,92,320

(Directs staff cost per month X 12)

E. Direct Staff cost per hour : Rs 2,140

(Rs 16,48,800 / 1680 hours)

F. Number of manhours of efforts towards development: 320 hours

G. Direct Staff cost (Rs 977 x 320 hours) : Rs 6,84,800

A similar exercise for all categories of staff involved in development shall be carried out.

EQUIPMENT USAGE COST

Sl.No	Description	Value	Basis for estimation
1.0	Capital cost of equipment	Rs 25,00,000	Purchase Order available with Purchase/Accounts
2.0	Annual Costs		
2.1	Power / fuel	Rs 80,000	Estimated based on Machine capacity rating
2.2	Operators wages / supervision Charges (assuming @ Rs 12,000 per month, single operator)	Rs 1,44,000	
2.3	Consumable like coolant / lubricants etc	Rs 20,000	Engineering estimate
2.4	Tools required etc	Rs 80,000	
2.5	Repair / overhaul charges	Rs 20,000	
2.6	AMC Cost	Rs 1,75,000	
2.7	Other direct charges for running machine; general lighting / air conditioning costs etc	Rs 10,000	
2.8	Total recurring cost (2.1 to 2.7)	Rs 5,29,000	
3.0	Depreciation cost	Rs 2,50,000	Calculated at 10% of the capital cost of Rs. 25,00,000 considering the estimated life of the equipment as 10 years
4.0	Total Annual Cost (2.8 + 3)	Rs 7,79,000	
5.0	Equipment usage cost		
5.1	Per hour equipment usage cost Rs. 7,79,000 / 1680 hours	Rs 464 per hour	
5.2	No. of hours of equipment usage for tech. transfer and or development	420 hours	
5.3	Equipment usage cost: Per hour equipment usage cost X no. of hours of usage of machine for tech. Transfer (5.1 X 5.2)	Rs 1,94,880	

COST REPORT
TECHNOLOGY TRANSFER OF

Sl.No	Description	Value (in Rs)
1.1	Direct Material / Component Cost (Indigenous and Imported)	
1.2	Direct Staff Cost	
1.3	Equipment Usage Cost	
1.4	Fabrication Expense	
1.5	Travel and Logistic Expense	
1.6	System / Sub System Level Testing Expense	
1.7	Other direct cost not included in above category	
2.0	Total (1.1 to 1.7)	
3.0	Intellectual Cost(@ 10%)	
4.0	Total Development Cost for Tech. Transfer (2.0 + 3.0)	

Prepared by:

.....
 (Divisional Head)

.....
 (Head, TT Group)

Approved by:

.....
 (Head, Accounts & IFA)

Memorandum of Understanding (MOU)

Between

NewSpace India Limited, Bangalore

And

Department of Space, Government of India

For

Transferring of Technologies to Industries

NewSpace India Limited

New BEL Road

Bangalore – 560 094

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (“**MOU**”) is entered into on this the _____ day of _____, 2020 (“**Effective date**”) at Bangalore

By and Between

NewSpace India Limited, a wholly owned Government of India Company incorporated under the Companies Act, 2013, having its registered office at Room No. F01, HSFC Building, ISRO HQ, New BEL Road, Bangalore-560 094, Karnataka, represented herein by its Director (T&S) (hereinafter referred to as “**NSIL**”, which expression shall unless repugnant to the meaning or context thereof mean and include its successors, administrators, legal representatives and assigns) of the One Part;

And

Department of Space (DOS), Government of India, having its Headquarters at Antariksh Bhavan, New BEL Road, Bangalore-560 094, Karnataka, represented herein by Director, Capacity Building Programme office (CBPO), ISRO HQ(hereinafter referred to as “**DOS**”, which expression shall unless repugnant to the meaning or context thereof mean and include its successors, administrators, legal representatives and assigns) of the Other Part.

NSIL and DOS hereinafter may individually be referred to as the “**Party**” and collectively as the “**Parties**”, as the context may require.

WHEREAS:-

- A. NSIL is a Central Public Sector Enterprise under Department of Space engaged *inter-alia* in commercial exploitation of space products, technical consultancy services and transfer of technologies developed by DOS/ISRO. It markets the products and services emanating from the Indian Space Programmes. NSIL will commercialise the technologies through Announcement of Opportunities/ Interest Expression Notes and enter into MOUs with licensee industries for transferring the technologies developed by DOS/ ISRO centres/ units.
- B. DOS/ISRO centres/ units, coming under the administrative control of DOS, are responsible for development & identifying of new technologies for transferring to industry and estimating the costs associated with the technology development, as per the policy and guidelines approved by Department of Space. The transfer of

technology (ToT) aims at contributing towards technological self-reliance, industrial growth and national development. The direct revenue returns to DOS/ISRO from the process of technology transfer have relatively minor importance.

- C. Capacity Building Programme Office (CBPO), a centralised office responsible for capacity building activities of DOS/ ISRO including technology transfer, would be the nodal agency for ensuring the technology transfer activities across all the DOS/ ISRO centres/ units, as per the approved policy and guidelines. It also acts as a liaison office between DOS/ ISRO centres/ units and NSIL for effective transfer of technologies from ISRO to Industry through NSIL.
- D. The Parties are interested in developing a robust technology transfer mechanism in Department of Space.
- E. After mutual discussion(s), both the Parties have decided to enter into this MOU to transfer the DOS/ ISRO identified technologies to industry(ies) for commercial, societal and buy-back purposes.

NOW THEREFORE, in consideration of the mutual promises and covenants contained herein, the Parties hereto agree to the following terms and conditions:

1. SCOPE OF MEMORANDUM OF UNDERSTANDING

This MOU contains the modalities, terms and conditions for transferring, DOS/ ISRO developed technologies to NSIL for commercialisation, to the extent applicable for enabling NSIL to enter into a suitable Licensing Agreement(s) with the Licensees identified through an Announcement of Opportunity (AO) or Interest Exploratory Note (IEN), to develop a competitive and cost effective Industry ecosystem in India for producing goods / services for commercial, societal demands and buy back purposes.

2. PLAN OF ACTION AND RESPONSIBILITIES

2.1. RESPONSIBILITIES OF NSIL

- a) To announce the opportunities through Interest Exploratory Note (IEN) and publicise the technologies identified by ISRO/ DOS for transfer.
- b) Finalising the License for each technology based on the approved ToT cost and market demand for the technology.

- c) To draft the requisite documents, including the Licensing Agreement(s), Confidentiality and Non-Disclosure Agreement(s) etc, to be executed with the Licensee(s) as applicable.
- d) To ensure appropriate confidentiality is maintained by the Licensee(s) in respect of the ToT agreement.

2.2. **RESPONSIBILITES OF ISRO/DOS**

- a) To identify new technologies for transfer and working out ToT cost as per the policy and guidelines as approved by Department of Space from time to time.
- b) Preparing the technology transfer document, specifications, drawings and any other information enabling smooth transfer of technology to industry through NSIL.
- c) Obtaining the approval of DOS for transferring the technologies along with ToT cost to NSIL.
- d) Communicating ToT Cost to NSIL that should be paid by NSIL to DOS.
- e) Constituting review committees at centre level and ISRO level for ensuring the implementation of policy and guidelines.
- f) Identifying the personnel for training and handholding the industry as requested by NSIL for smooth technology transfer and ensure seamless transfer of technology to licensee industry.

3. **FINANCIALS**

3.1. NSIL shall pay the ToT cost to DOS as detailed hereunder:

3.1.1. NSIL shall pay ISRO/ DOS amount equivalent to the ToT cost mentioned in the approval letter either at one time or milestones, subject to receipt of the license fee from the industry(ies).

3.1.2. Due to low demand for the technology in the market, in case if the license fee received by NSIL is less than the ToT cost, the same shall be restricted to the amount received minus the profit & administering expenses as specified by the Board of NSIL.

3.2. Any modifications /changes in the financial structure that are not envisaged now, but that reveal during the course of this MoU shall be implemented with mutual consent of the parties and as an amendment to this MoU at any stage during the course, but before the contract signing with the Selected Industry(ies).

3.3. Any additional cost on account of additional training or consultancy which are not covered in the MoU shall be charged extra based on the actuals.

4. DURATION OF MOU

This MOU shall remain in force unless it is concluded or terminated on the advice of Secretary, DOS/Chairman, ISRO (or) on mutual consent by both the Parties.

5. EXERCISING AUTHORITY

The executing authority in the case of NSIL shall be the Director, T&S, NSIL and in the case of DOS shall be the Director, CBPO, ISRO HQ of DOS

6. IP RIGHTS AND ROYALTY

- 6.1 Nothing contained in this MOU shall be construed or sought to be interpreted to authorize either of the Parties to use any of the Intellectual Property Rights (“IPRs”) of the other Party, nor is any of the terms of this MOU is understood to be nor should it be sought to be interpreted to permit either of the Parties to use the other Party’s logo, trade or corporate names etc. in any manner whatsoever, without the prior written consent of the other Party.
- 6.2 The IPRs of all the Confidential Information, documents, drawings, testing, packaging details and any written communication furnished by ISRO centre as a part of the work specified herein shall remain the property of DOS/ ISRO.
- 6.3 Each Party shall ensure appropriate protection of IPRs generated from co-operation pursuant to this MOU, consistent with their respective roles, responsibilities, laws, rules, regulations and internal arrangements to which both Parties are committed.
- 6.4 NSIL shall include necessary clauses in the Licensing Agreement to be executed with the identified/ selected Licensee(s) prohibiting them from directly or indirectly further utilizing or passing on any of the Confidential Information, design details, drawings, schematics etc. in whole or part to any third party under any circumstances, without the prior written consent of DOS/ISRO.
- 6.8 The Parties shall not assign any rights and obligations arising out of the IPRs generated to inventions/ activities carried out under this MoU to any third Party without consent of the other Party.

7. CONFIDENTIALITY, NON-DISCLOSURE

- 7.1 For the purposes of this MOU, the term “**Confidential Information**” shall mean any and all information and other materials disclosed, furnished, communicated or supplied by DOS/ISRO to NSIL and/or the Licensee(s), including to their directors, officers, employees or its expressly authorized representatives or agents (collectively referred to as “**representatives**”).
- 7.2 The Parties agree and undertake to keep the Confidential Information secret and strictly confidential and not to use or disclose it, directly or indirectly, whether in whole or in part, in any manner whatsoever, to any third party except as provided herein and to ensure that the Confidential Information is protected with the highest security measures and a degree of care that would apply to its own strictly confidential information;
- 7.3 NSIL shall ensure that the necessary clauses shall be included in the Licensing Agreements and Confidentiality & Non-Disclosure Agreements to be executed with the Licensee(s) so that all the Confidential Information and the documents prepared for fabrication, test procedures, log books, drawings, schematics and any other communications, codes revealed during the process of testing shall remain as an exclusive property of ISRO/DOS.
- 7.4 The Parties agree that this MOU and the disclosure of the Confidential Information do not grant or imply any license, interest or right to NSIL and/or the Licensee(s) in respect to any IPRs of the DOS/ISRO centres participating.

8. ENTIRE UNDERSTANDING & MODIFICATIONS OF MOU

This MOU constitutes the entire understanding and agreement between the Parties on the subject matter and supersedes all prior agreements, arrangements or understandings, whether oral, written, or implied. Any modifications to the provisions of this MOU, as necessary, shall be mutually discussed and agreed to by and between the Parties and will become applicable only when reduced into a written Amendment annexed to this MoU.

9. FORCE MAJEURE

Any delay or failure by the Parties hereto in the performance of its obligations shall be excused if and to the extent caused by occurrences beyond the Party’s reasonable control, including acts of God, strikes or other labour disturbances, war, sabotage, acts or regulations of Government agencies or authorities, civil disorder, fire, explosion and any other cause which cannot be reasonably controlled by either Party (“**Force Majeure**”).

Events”). However, such delay or failure shall not relieve the Party of its obligations, once cause for the same is removed. The condition of force majeure shall be informed to the other Party within 30 days of occurrence to enable the other Parties to take a decision on whether to continue or determine this MOU, including for deciding further course of action regarding the implementation of the technology transfer. Neither Party shall be held liable for the consequences that may arise due to the conditions of the said Force Majeure Events.

10. ARBITRATION

In the event of any claim, dispute, difference, controversy (the **“Dispute”**) between the Parties to this MOU, such Disputes shall be resolved amicably by mutual consultation between the Parties. If such resolution is not possible within 30 days from the date of its occurrence, then the unresolved Dispute shall be referred and resolved through Arbitration and the Secretary, DOS shall be the sole Arbitrator, whose award or decision shall be final and binding on the Parties.

11. INDEMNIFICATION

- 11.1 NSIL shall indemnify and hold harmless DOS/ ISRO and their officers, employees and representatives (each, an **“Indemnified Person”**) from and against any claim, loss or liability, damage, expense (including without limitation fees and expenses of solicitor and legal counsel) arising out of the breach of the obligations specified herein, negligence or willful misconduct of NSIL and/or the Licensee(s) and their representatives.
- 11.2 NSIL shall incorporate the necessary clauses in the Licensing Agreement to be executed with the Licensee(s) to ensure that that the Licensee(s) shall not be entitled to sue DOS/ISRO and shall not have any recourse against DOS/ISRO for any claims, actions, demands, costs, expenses, damages of whatsoever nature incurred under any circumstances under ToT agreement.
- 11.3 DOS shall indemnify and hold harmless NSIL and their officers, employees and representatives (each, an “Indemnified Person”) from and against any claim, loss or liability, damage, expense (including without limitation fees and expenses of solicitor and legal counsel) by a 3rd party due to violation or Breach of Intellectual Property Rights or Copyright due to transfer of DOS identified technology to Industries.

12. WARRANTY

ISRO centers as applicable warrant that the know-how, technical specifications, codes, drawings and Confidential Information disclosed or furnished to NSIL and/or its Licensee(s) and the training provided to the

personnel of its Licensee(s) shall be sufficient and complete to implement the technology that will be able to manufacture the deliverables.

13. AUDIT

NSIL agrees and ensures that at any time during the working hours and with prior written notice, DOS/ISRO and their authorized representatives may have access to the premises of NSIL and/or Licensee(s) to verify the correct performance of their obligations.

14. TERMINATION

This MOU may be terminated by either Party through a three-month prior written notice for non-fulfillment of any of the clauses of this MOU. In case this MOU is terminated for non-fulfillment of the obligations specified herein, the settlement of account shall be done by mutual consent of the Parties.

15. EFFECTIVE DATE OF MOU

This MOU shall be effective from the date of signing by both the Parties.

IN WITNESS THEREOF, each Party has caused this MOU to be executed on the Effective date as aforementioned.

For and on behalf of NewSpace India Limited	For and on behalf of ISRO, Department of Space (DOS)
Signature:- Name: Designation: Director, T&S	Signature:- Name:- Designation:- Director, Capacity Building Programme Office

WITNESS:

1.

2.