

Technology Centre Systems Program

Environment Management Framework

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Ministry of Micro, Small, Medium and Micro Enterprises
Government of India

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Annexures

Acronyms

CII	Confederation of Indian Industry
CRM	Customer Relationship Management
DC-MSME	Development Commissioner, MSME
DDO	Drawing and Disbursement Officer
EMC	Electronics Manufacturing Cluster
EMF	Environment Management Framework
EMP	Environment Management Plan
ERP	Enterprise Resource Planning
ESDM	Electronics System Design & Manufacturing
GFR	General Financial Rules
KPIs	Key Performance Indicators
M&E	Monitoring and Evaluation
MGIRI	Mahatama Gandhi Institute for Rural Industrialization
MSME	Micro, Small and Medium Enterprises
NPM	National Program Manager
OP/BP	Operations Policy / Bank Procedure
PDO	Program Development Objectives
PMEGP	Prime Minister's Employment Generation Program
PMS	Program Monitoring System
SA	Social Assessment
SMF	Social Management Framework
SPVs	Special Purpose Vehicles
TAGMA	Tool & Gauge Manufacturers Association of India
TCs	Technology Centres (also called Tool Rooms)
TCSP	Technology Centre Systems Program
UCs	Utilization Certificates
UNIDO	United Nations Industrial Development Organization
WB	The World Bank

1.1 Background

India is one of the world's largest and most dynamic emerging markets with vast economic potential. However, its recent economic performance has been under par; GDP growth decreased from 10.5 percent in 2010 to 5 percent in 2013 (year-to-end as of March 2013). While India stands to benefit from an immense demographic dividend, with the largest youth population in the world (around 66 percent of the total population is under the age of 35), 11 percent of these are unemployed, and overall labor participation is low at 56 percent.

Manufacturing has been recognized as an essential driver of economic development for most developing countries and has an important economic and employment multiplier effect. The manufacturing sector is expected to play an important role in returning India to high growth rates. However, India's manufacturing performance has not been very encouraging despite a strong potential. Its share of GDP has stagnated at around 15 percent compared to more than 30 percent (and growing) in East Asia. In order to achieve a sustained GDP growth, the manufacturing sector is required to maintain competitiveness to address the challenge of globalization.

India's manufacturing remains dominated by low productivity Micro, Small and Medium Enterprises (MSMEs) co-existing with a few, sometimes world class, large manufacturers. The MSMEs can play an important role in India's economic development and in the creation of productive jobs, especially in rural areas. The MSME sector has been witnessing a strong growth in recent years, accounting for more than 45% of the manufacturing output and around 40% of the total export of India as of 2012-13. This sector is also the leading provider for employment and business avenues in rural and urban India, thereby spurring equitable and inclusive growth across local economies. Arguably, MSMEs play a crucial role in the socio-economic growth story of India.

Yet, the potential of the Indian MSMEs in creating jobs and livelihood generation opportunities remains untapped. Inadequate access to technology, technical and business skills and finance have been highlighted as some of the key constraints for the MSMEs in the manufacturing sector.

1.2 Sector Context – MSMEs in India

According to the fourth All India Census of MSMEs, the number of enterprises and employment opportunities in this sector has grown by more than 25 percent in the period 2006-07 to 2011-12 compared to the period 2001-02 to 2006-07, compounded annually. Of this, rural areas accounted for more than half the share of total MSME growth in India. As evidenced by these figures, strengthening the MSME system is essential for achieving balanced economic development and creating productive jobs called for by India's demographic dividend. Recognizing its potential, the Government of India has set an objective of creating 100 million additional jobs in the recently announced National Manufacturing Policy.

¹ Annual Report 2012-13, Ministry of MSME, Government of India

It is also interesting to note that whereas the fourth All India Census data shows growth, the figures as evidenced by the registration of MSME in the last five years, in fact, further strengthen the impression that MSME in India are doing well, indeed, thriving. The growth of registered MSMEs at the all India level in the last five years is given in the following table:

Snapshot of MSME growth	
Period	Growth Rate (%)
2007-08 to 2008-09	10.76
2008-09 to 2009-10	10.78
2009-10 to 2010-11	10.93
2010-11 to 2011-12	19.06

As evidenced by these figures, strengthening the MSME ecosystem is essential for achieving balanced economic development and creating productive jobs called for by India's demographic dividend.

The success of the industry and its sustainability depends on major interventions viz. Technology, Innovation, Finance, Training, Marketing and personnel. The ecosystem for sustainable development of small industries has linkages with policy framework and MSMEs who supply products for domestic consumption and for large industries (for example for auto majors, Electronic System Design and Manufacturing, Plastic and other high value engineering sectors). Nonetheless, there are constraints to the growth and competitiveness of India's manufacturing sector, specifically for the MSMEs. These bottlenecks include difficulties to access markets (including within India), difficulties to access finance (especially for MSMEs), infrastructure deficiencies, regulatory red tape, disincentives for MSMEs to grow and difficulties for MSMEs to access technology (including green/environment friendly) and skills.

1.3 Key Achievements and Challenges Faced by MSME Sector in India

The MSME sector is the second largest employment generator in India after agriculture. While MSMEs are a key source of employment for low-skilled and semi-skilled workers, the sector has been working hard towards upgrading the skill base and attracting more talent. In line with this, the Government and various private players are heavily investing in training centres. A good example for this is up-gradation of nearly 1,390 Industrial Training Institutes (ITIs) across India through public private partnerships (PPPs). MSMEs have been coordinating with private sector players in upgrading skills and delivering quality.

Large industrial firms (such as those in automotive sector) often tend to be the end-customer for MSMEs. To ensure product quality, these firms often coordinate with smaller suppliers to impart the requisite skills and ensure adherence to standardised processes. The government as well as NGOs have been actively involved in this endeavour. With improving skills, better coordination with bigger firms and greater technological access, MSMEs in India have moved into a higher trajectory of success. The sector currently produces more than 6,000 quality products, ranging from handloom saris, carpets and soaps to pickles and machine parts, for huge industries targeting domestic and international markets.

The numerous advantages of operating in a cluster have prompted several regional and local organisations to take up cluster-based projects and promote smaller firms. The various central government initiatives involve provision of technical aid, grant for technology advancement and marketing assistance to provide a competitive edge to MSME units in the global ecosystem. State governments of Andhra Pradesh, Gujarat, Kerala, Madhya Pradesh and Tamil Nadu have also undertaken cluster development strategies. The early advancements in the field are formation of National Small Industrial Corporation Ltd., Small Industries Development Bank of India, Khadi and Village Industries Commission, The Baba Saheb Ambedkar Hastshilp Vikas Yojana Scheme, United Nations Industrial Development Organisation Cluster Development Programme, State Bank of India's UPTECH Programme, and Rajasthan Chamber of Commerce and Industry, among others. The soft and hard intervention provided due to MSE-Cluster Development Programme, Lean Manufacturing Programme, ISO Certification Programme and other information and communication tools programmes launched by the Government of India would also help industrial clusters in India to improve their productivity. To avail benefits from the above mentioned funding schemes, the government is actively disseminating information amongst rural entrepreneurs. Moreover, schemes and programmes supporting infrastructure, skill set, and entrepreneurship and technology development, coupled with cluster-building activities, would help in optimising the returns and maximising the country's growth in the long term.

Globally, MSMEs are known to be the engine of economic growth and for promoting equitable development. In India too, the MSMEs play a critical role in overall industrial economy of the country. Despite the sector's strategic importance in overall industrialization strategy and employment generation, as well as the opportunities that the Indian landscape presents, the MSME sector confronts several challenges. Technological obsolescence and financing problems have been associated with the sector since long. Also, constraints such as high cost of credit, low access to new technology, poor adaptability to changing trends, lack of access to international markets, lack of skilled manpower, inadequate infrastructure facility, including power, water, roads, etc., and regulatory issues related to taxation (state-central), labour laws, environmental issues etc. are also linked with its growth process.

Thus, in spite of the immense contribution of such a pre-capital sector towards economic development, it is surrounded with numerous challenges and problems. The challenges and problems are not only many in number but they are multidimensional also. A few acute challenges and problems are mentioned below:

- Lack of availability of adequate and timely credit
- High cost of credit
- Collateral requirements
- Limited access to equity as well as risk capital
- Non availability of raw materials at competitive cost
- Lack of access to global market
- Inadequate infrastructure facilities, like road, communication system and power
- Complex labour laws and complicated procedures to compliance of such laws
- Issue relating to taxation and their procedure
- Lack of modern technology
- High competition in the global market
- Lack of skilled manpower relating to production, marketing and service

- Problems of storage, packaging and product display
- Lack of suitable mechanism for the revival of viable sick units and to allow unviable units to close down speedily
- Lack of marketing promotion both domestic and export; Poor local initiative
- Increased regulation
- Difficulty in identifying appropriate technology and assistance
- Inadequate linkage between large industries and MSMEs and the creation of sub-contracting facilities at the national, regional and international level
- Inadequate quality control and testing facility
- Poor scientific and industrial research
- Not enough information collection and dissemination about various aspects among MEMEs

1.4 Project Context

Tooling and skill development have been recognized as the most important factors contributing to the growth of the MSME sector. In line with this, the Government of India (GoI) has set up few Tool Rooms and Training Centres of large sizes, in order to provide facilities for the design and manufacture of toolings, and also for training to improve the skill of tool markers, for the benefit of industries in MSME sector. In addition, GoI has been assisting the state Governments in setting up mini TCs. Currently, there are **ten existing large Tool Rooms/Technology Centres and eight other smaller TCs run by the MoMSME**. Of these, six Technology Centres are for specific trades like Footwear, Sports Goods and Fragrance and Flavours.

These Tool Rooms are highly proficient in Tool and Die Making Technology and promote precision and quality in the development and manufacture of sophisticated moulds, dies, tools and equipment. The Tool Rooms are concentrating on an integrated development of related segments of industries by way of providing international quality products, trained personnel and consultancy in Product and Process Development including turnkey projects.

In the Indian context, these Tool Rooms are facilitators of sustainable eco-system development as they support the MSMEs from development stages beginning from Reverse Engineering to Design and Development of products and components of high precision through state of art machinery and equipment. These Tools Rooms provide a technological push for process and product development in the following areas:

- Product development interventions, which include design innovation, value engineering and material substitution.
- Process development it includes process design, improvement of production technology and consultancy.
- Support to MSMEs in the field of skill up-gradation of their manpower for sustainable development.

Against this backdrop, the proposed national Program is aiming to develop the technological and skill base of MSMEs in selected manufacturing industries (the tooling industry in particular), via upgraded and expanded Systems of specialized Technology Centres (TCs) (currently called Tool Rooms and Technology Development Centres).

For meeting the needs of an increasing demand of skilled labour and facilities which can cater to the MSME sector by supporting research and advanced tooling equipment and services, the Government of India has envisaged **setting-up of 15 additional Technology Centres**. This will not only help the MSME sector to grow but shall also serve as the R&D facility and technology partner for industries and serve as a platform for young minds to enhance the learning curve.

1.5 Project Objective

The Program's Development Objective (PDO) is enhancing MSME's access to transformative technologies and increasing the number of skilled workers, through systems of financially sustainable Technology Centers.

1.6 Proposed Project Components

The proposed national Program/project will finance the following activities grouped into the following three components:

Component 1: Technical assistance to the existing and new Technology Centers

1. The TCs and their private sector clients will benefit, for the duration of the Program, from the technical assistance of world class firms that will provide superior technology related inputs with respect to the technological and business needs. These two streams of technical assistance will run in parallel and inform each other under the guidance of industry specific joint working groups comprising the main industry leaders and representatives.
2. Technology Partners for each system of TCs specialized on specific industries/technologies. The ToRs of these internationally competitively recruited Technology Partners will include:
 - a. *Technology development* - Identification of existing and expected future technologies (e.g. 3D printing in the area of manufacturing) that need to be worked on and disseminated by the TCs amongst MSMEs which could have a transformational impact on their efficiencies and competitiveness. This would include developing a detailed strategy/roadmap so that the MSMEs in each selected industry can take advantage of such cutting edge/competitive technology inputs. This will be done through alignment and consultations with industry leaders, academia and research institutes. The Technology Partners will help the TCs put in place the capacity to support MSMEs with respect to: (i) being exposed to the potential impact of new technologies, (ii) learning how to use new technologies/equipment, (iii) providing access to cutting-edge equipment, (iv) developing and testing new products and (v) patenting.
 - b. *Human skill development* – Development of a demand analysis, skills gap assessment and strategy/roadmap by consulting stakeholders to develop skills of the workers and students in the identified technologies and clusters. This will entail, amongst other things the development of world class training curricula, pilot training modules, new e-learning modules, standards and certification schemes etc. This will also entail training of trainers (for TCs as well as other public and private training institutions), faculty exchanges as well as the development of examination/validation/ certification systems etc. The new tools and interventions will be put forward for mainstreaming within the current

- E-Commerce/e-Biz Platform for MSME with functionalities to port catalogues, search for products/services, buyers, order placement, payment transactions, man power requirements, report generation etc.
 - Management and Delivery of all MSME Schemes – online applications, approvals, status etc.
 - Facilitating procurement by Government Departments / PSUs from MSMEs
 - Job Exchange (for skilled workforce for MSMEs) including registration of candidates, search, communication, report generation etc.
 - Enabling skill development including management of database.
 - Skill Development of MSMEs including development of training modules
 - HR Management System
 - MIS Reporting System for TCSP
- b. ITP enabled IT services have numerous advantages such as:
- 24x7 access to users with high availability and reliability as per SLA; Most of the Capital expenditure associated with IT software and hardware will be converted to monthly 'rental' for services used. Flexibility to add and/or remove services as needed. Also will ensure no "vendor lock-in"; Overall much more affordable by SMEs and standard formats make it easier for SMEs to use. Furthermore, it will boost productivity through applications like ERP; Centrally managed billing, accounting and more robust cyber security of ITP; Location and access device independent, providing deeper "reach" to rural SMEs.

Component 2: Investments to develop new and upgrade existing Technology Centers

The Program will finance the development of 15 new TCs and upgrade 18 existing TCs. These investments will be informed by the Technology Partners and Cluster Managers discussed under Component 1 above as well as by the Implementation Partner which has been competitively hired (see Component 3 below). The development of new TCs will be phased over time. The construction should start in the second year and be completed by the fourth year of program implementation.

- a. Land – the Program is expected to span across multiple states (including less developed States). Most States have already expressed a strong interest in the Program and committed to allocate land for the new TCs.
- b. The focus (in terms of industries/technologies) and locations of the new TCs will be selected/prioritized during the first year of operations using the following criteria/cascading down filters:
 - i) Size and growth potential of the industry
 - ii) Importance played by SMEs in the industry
 - iii) Potential transformative impact of SMEs/workers/students acquiring/learning new technologies and knowledge
 - iv) Difficulties for SMEs/workers/students for acquiring/learning these new technologies and knowledge assessed on the basis of prices/costs and the extent to which private players are/could supply such services on their own.

- v) Successful examples of such TCs from other countries (e.g. Fraunhofer Institute for the Automotive sector, ITRI for the electronics sector)
 - vi) Expressed interest/support from the Indian private sector (e.g. willingness to cover at least the variable costs of providing these services and to invest in the TC in the case of an SPV). Such interest/support should come from large companies/industry leaders in addition to MSMEs
 - vii) Social impact – extent to which the new TC will benefit MSMEs/workers/students from poor background/Low Income States
 - viii) Expressed interest/support from local government (e.g. through the provision of the land for the TC).
 - ix) Suitability (from an economic, social and environmental point of view) of the land being offered (followed by request for alternative offers if deemed not suitable).
- c. Buildings/ other infrastructure (\$70 million) – The physical facilities of the TCs will be upgraded and developed with the following objectives in mind:
- i) World class with respect to facilitating the provision of their services
 - ii) Green to minimize their environmental impact
 - iii) Economic to reduce costs
 - iv) Flexibility with respect to usage and expansion/contraction
- d. Equipment/ Software – to be purchased following the advice of the Technical Partners as discussed above and following the same broad principles as for the buildings.
- e. Start-up costs of new Technology Centers – The program will finance the difference between revenues and operational costs (excluding depreciation) of the new TCs until they become financially sustainable. Based on past experience, the expectations is that new TCs become financially sustainable (before depreciation) within two years.

Component 3: Technical assistance to the MSME Ministry for Program implementation and Monitoring and Evaluation

Implementation Partner - The Program will be implemented with the support of Ernst & Young with RITES and MTC (Manufacturing Technology Consultant) as sub-consultants, the latter being a leading company in the field of Technology Centers from the United Kingdom. The Implementation Partner has been recruited during program preparation through an international competitive bid, it will provide support in the following areas:

- 1. Procurement (e.g. preparation of ToRs and bidding documents)
 - 2. Financial management
 - 3. Contract management
 - 4. Environmental and social safeguards
 - 5. Monitoring and Evaluation
- a. Small dedicated team – This team will consist of a National Program Manager (NPM), a Procurement Specialist and a Financial Management Specialist. The team will act

as the interface between the Implementation Partner and the Program Coordinator of the MSME Ministry (see the section on the implementation and governance framework for the Program below).

- b. Other TA (\$5 million) – this will entail training of staff to support the capacity of the Ministry with respect to the design and implementation of other related MSME support programs, financial management, procurement, IT and M&E systems. It will also support the development of new initiatives to help MSMEs access sources of finance as well as help them improve their labor and environmental standards.
- c. The M&E systems will include in particular independent surveys of customers and stakeholders to assess the transformative impact of the program as well as to ensure there is no significant crowding-out of the private sector. Such surveys will be designed and launched during the first year of program implementation.
- d. The Program will seek to strengthen the current organizational model and performance management of TCs to achieve transformational impact in a substantial and durable manner, including through accountability measures building on the Results Framework Document (RFD) and subsidiary RFDs at the TC level. The MSME RFD states its objectives, performance (and governance and accountability) indicators and related planned actions. It is drafted every year and publicly disclosed. It significantly strengthens the program governance framework (e.g. by committing to MSME ISO 9001 certification, the elaboration of a mitigating strategy of the risks of fraud and corruption and to the independent auditing of its public grievance mechanism and citizens’ charter). When conditions permit, technology centers will be market tested to explore other organizational models to deepen private sector participation. In order to protect against the risk of private capture, these initiatives will incorporate appropriate safeguards such as having explicit provisions enabling the State to buy back the investment of the private partners at any time.

1.7 Project Cost and Financing and Duration

The total project cost to the Government of India will be USD 500 million. The cost is split evenly between a USD 250 million Investment Project Facility Loan from the World Bank (International Development Association) and USD 250 million of direct contribution by the Central/State Governments in the form of the land required for the construction of new Technology Centers.

1.8 Project Duration

The project length is estimated to be six years to allow adequate time to design, construct, equip, staff, operate and evaluate the proposed Technology Centers, which account for the majority of the total project cost. It is estimated that two to three years would be required to select, design and construct these centers, leaving another three years to engage in operations.

1.9 Project Implementation Agencies

The National Program will be governed by a Program Steering Committee (PSC) chaired by the Secretary of the MoMSME and will comprise representatives of the main stakeholders, including from: Ministry of Science and Technology, Ministry of Communication and Information Technology, Ministry of Heavy Industry, Ministry of Labor (DGE&T), State Governments through their Principal Secretaries/Secretaries of Industry, the National Skill Development Agency, Academia and Research Institutes as well as the relevant leading industry associations. This Program Steering Committee is expected to play an important role also during Program preparation.

The program implementation responsibility will lie with the Development Commissioner of the MSME Ministry. The Development Commissioner (DC), MSME will designate a Program Coordinator (PC) assisted by a small dedicated team which will act as the interface between the Development Commissioner (MSME) and the Implementation Partner (IP). The IP was procured competitively through international bidding, and will together with the PC and his core team form the Program Implementation Unit (PIU), to carry out the day-to-day management of the entire program.

Chapter 2: Approach and Methodology Used

This chapter presents the need, approach and methodology used for preparing the Environment Management Framework for the Technology Centre Systems Program. It also outlines the contents of this report and presents its mode of application and limitations.

2.1 Need for Environment Management

Technical Centres (TCs) are like mini-industries. Planning, development and management of the TCs may involve several critical environmental obligations and issues around occupational health and safety. Good environmental management practices are essential and integral elements of sound project preparation and implementation and therefore, an Environment Management tool would be needed for preventing or overcoming environmental issues encountered during the various stages of project – from planning, design, construction to operation. Such a tool should be prepared with an intention to strengthen the intended outcomes from the proposed project/program.

2.2 Purpose of Environment Management Framework

The technical analysis for selection of specific trades/sub-sectors and clusters to be created/supported is currently underway – this will ultimately determine the locations or sites at which new Technology Centres would come-up. For the upgrading of existing Tool Rooms too, the technology related choices and options are being discussed and deliberated upon with the relevant stakeholders and final decisions are expected to be made only later in the project preparation cycle. Given these uncertainties and evolving situations, it was considered appropriate to prepare an Environment Management Framework for the project at this juncture than Technology Centre Specific Management/Mitigation Plans.

Given the need for appropriate environmental management in the sector and in the current context of the project formulation, the EMF specifically seeks to:

- Establish clear procedures and methodologies for environmental planning, review, approval and implementation of sub-projects to be financed under the Project.
- To provide practical guidance for planning, designing and implementing the environmental management measures.
- Specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and related social concerns of the sub-projects and;
- Determine the institutional arrangements, including those related to training, capacity building and technical assistance (if required) needed to successfully implement the provisions of the EMF.

2.3 Objectives of Environment Management Framework (EMF)

The application and implementation of the EMF therefore, will:

- Support the integration of environmental aspects into the decision making process of all stages related to planning, design, execution, operation and maintenance of sub-projects, by identifying, avoiding and/or minimizing adverse environmental and social impacts early-on in the project cycle.
- Enhance the positive/sustainable environmental and social outcomes through improved/ sensitive planning, design and implementation of sub-activities.
- Minimize environmental degradation resulting from individual sub-projects or through their indirect, induced and cumulative effects, as much as possible and
- Protect human health.

The use / implementation of the EMF will also support the achievement of compliance with applicable laws and regulations as well as with the requirements of relevant Bank policies on environmental safeguard aspects.

The EMF will act as a guiding document for managing environmental issues and risks resulting or associated with program/project operation and suggests the necessary actions required in terms of precautions to be taken, corrective actions in case of negative impact on environment, mechanisms/approach to be adopted during the implementation, including on capacity building requirements.

Specifically, the EMF will help in addressing the following aspects:

- Regulatory requirements
- Identification of potential environmental impacts and development of a Technology Centre specific Environment Management Plan to mitigate/minimize the adverse impacts on environment, human health and safety and enhance benefits from the operation;
- Delineation of roles and responsibilities for implementation of EMF/EMP.

2.4 Methodology Adopted for EMF preparation

The following activities were undertaken for the purpose of preparing Environment Management Framework (EMF):

1. Desk review to identify the relevant national standards, codes and legislation related to the planning, design, construction of institutional buildings and operations;
2. Preparation of checklists for collecting project related information against applicable guidelines and for conducting a limited environmental assessment
3. Review of land allocation documents, permits and other relevant documents
4. Sample field based examination (supplemented by desk review) to identify if these standards and codes are used in the site development, construction and operation of building facilities and technologies of the Tool Rooms/Technology Centres
5. Identification of good practices and environmental issues faced in the existing Technology Centres
6. Formal interviews on a sample basis with the following stakeholders:
 - ✓ Students/trainees at the Tool Rooms

- ✓ Faculty members and other employees at the Tool Rooms
 - ✓ Local community people around the site
 - ✓ Representatives of third parties (industry representatives) using facility of Tool Rooms
 - ✓ Officials from the MoMSME
7. Preparation of the draft EMF
 8. Presentation and disclosure of the draft EMF to stakeholders (including those at the national level) to seek feedback
 9. Finalisation of the EMF

2.5 Contents/Structure of Environment Management Framework (EMF)

The EMF defines the principles, objectives and approach to be followed for selecting, avoiding, minimizing and/or mitigating the adverse environmental impacts that are likely to arise due to the project. Based on review of existing national/state statutory and World Bank safeguard policies compliance requirements, the framework outlines the various policies, guidelines and procedures that need to be integrated during the planning, design and implementation cycle of the Bank-funded project. It also outlines the indicative management measures and monitoring indicators/plan required to effectively address or deal with the key issues that have been identified. The required institutional arrangements for effective environment management have also been outlined as a part of this framework.

The EMF addresses environmental concerns through the appropriate application of process requirements, allocation of resources, assignment of responsibility and continuous evaluation of practices/procedures to facilitate continual improvement of the system. The framework describes the principles, objectives and approach to be followed for selecting, avoiding, minimizing and/or mitigating the adverse environmental impacts that are likely to arise due to the project. It outlines the indicative management measures required to effectively address or deal with the key issues that have been identified. The framework details out the various policies, guidelines and procedures that need to be integrated during the planning, design and implementation cycle of the Bank-funded project.

The required institutional arrangements for effective environment management have also been outlined as a part of this framework. The instrument provides a framework for managing environmental responsibilities efficiently in a way that the various requirements can be mainstreamed into the over-all operations. It helps in the management of environmental activities in a planned, systematic and comprehensive manner with appropriate documentation, as needed.

The contents of the report have been structured into the following chapters:

- Chapter 1: Introduction
- Chapter 2: Approach and Methodology used
- Chapter 3: Policy, Legal and Regulatory requirements
- Chapter 4: Existing environmental conditions

- Chapter 5: Potential environmental issues
- Chapter 6: Stakeholder Consultation
- Chapter 7: Environment Management for the Project – Approach and Tools
- Chapter 8: Implementation arrangements
- Annexures with supporting/detailed information

2.6 Application of the Environment Management Framework

The Environmental Management Framework includes the following:

- Information on Govt. of India's environmental legislations, standards; World Bank's safeguard policies and other international conventions/policies that is relevant in the over-all project context.
- Process to be followed for environmental screening to guide decision-making about proposed sub-projects.
- Steps and process to be followed for conducting environmental impact assessment and preparation of Environmental Management Plans for selected sub-projects
- Preliminary assessment of anticipated environmental impacts in the context of broad/known project interventions.
- Generic environment management measures to avoid, minimize and mitigate anticipated impacts
- Institutional arrangements for environment management, including monitoring and reporting.

The EMF will therefore serve as a guide book for both national (particularly the Program Implementation Partner) and state players undertaking the various project activities in an environment friendly manner, including those pertaining to creation of new Technology Centres, up-gradation of existing Tool Rooms and infusion of new technological improvements for improved productivity and for increasing competitiveness of MSMEs. This framework shall be applicable to all project components proposed to be taken-up under the Technology Centre Systems Program (this project).

2.7 Revision/Modification of the EMF

The EMF will be an 'up-to-date' or a 'live document' enabling revision, when and where necessary. Unexpected situations and/or changes in the project or sub-component design would therefore be assessed and appropriate management measures will be incorporated by updating the Environment Management Framework. Such revisions will also cover and update any changes/modifications introduced in the legal/regulatory regime of the country/state. Also, based on the experience of application and implementation of this framework, the provisions and procedures would be updated, as appropriate in consultation with the implementing agencies/departments and with approval of the World Bank.

At this stage, aspects pertaining to “choice of specific trades to be supported under the project” and related “technological aspects/improvements/ choices” will become clear only after the Implementation Partner (part of PMU) completes the on-going assessments and consultations in this regard. Once there is clarity on the said aspects, the EMF will be appropriately updated/ revised, as and when necessary to provide clear guidance on the preparation and implementation of Technology Centre specific environment management/mitigation plans.

2.8 Limitations of the EMF

This Environment Management Framework has been developed in line with applicable World Bank’s Operational Policies (OPs) and is based on the national and state laws and regulations, as applicable at the time of preparation of this document. Any proposed modifications in the laws, regulations or guidelines that were notified as ‘draft’ at the time of preparation of this document have not been considered.

Chapter 3 – Policy, Legal and Regulatory Requirements

The Chapter provides a reminder that all activities under the proposed project must be consistent with all applicable laws, regulations, notifications that are relevant in the context of the proposed project interventions. It is the responsibility of the Project Implementing Agency to ensure that proposed activities are consistent with the regulatory/legal framework, whether international, national, state or municipal/local. Additionally, it is also to be ensured that activities are consistent with World Bank's operational policies and guidelines. This section is not a legal opinion on the applicability of the law but serves as guidance in the application of the law to the current project context.

3.1 National Policies, Laws and Regulatory Requirements

The Environment (Protection) Act, 1986 serves as the umbrella environment legislation in India and entrusts joint responsibility with Ministry of Environment and Forests (MoEF) and the Central Pollution Control Board (CPCB) to ensure effective implementation of the environment legislation and regulations. The MoEF and the pollution control boards (CPCB i.e. Central Pollution Control Board and SPCBs i.e. State Pollution Control Boards /SPCCs i.e. State Pollution control Committee's) together form the regulatory and administrative core of the sector.

Two specific legislations (popularly called the Air Act and the Water Act) empower the central and state pollution control authorities to enforce emission and effluent standards for industries discharging pollutants into air and water.

In addition, the Supreme Court of India and some High Courts of the states have led the way in the enforcement of environmental laws through citizen-led public interest litigation (PIL) that has its legal basis in the constitutional right to a healthy environment. A summary of key environmental legislations applicable to the proposed project is given below:

Summary of Environmental Legislation Applicable to the Proposed Project

Act and/or Rules	Key Features	Applicability
Environment Protection Act, 1986 (to be read with The Environment Protection Rules, 1986)	The Act applies to all areas where the hazardous substances are handled.	Yes
The Air (Prevention and Control of Pollution) Act, 1981 (to be read with Air (Prevention and Control of Pollution) Rules, 1983)	The Act applies to any building, structure or property used for industrial or trade purposes where pollution occurs or emitting any air pollutant into the atmosphere takes place.	Yes

Act and/or Rules	Key Features	Applicability
The Water (Prevention and Control of Pollution) Act, 1974 (amended 1988)	The Act applies to every outlet that includes any conduit pipe or channel, open or closed, carrying sewage or trade effluent or any other holding arrangement which causes or is likely to cause, pollution.	Yes
The Factories Act, 1948	The Act applies to any premises including the precincts thereof - (i) where in ten or more workers are working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on with the aid of power. (ii) where in twenty or more workers are working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on without the aid of power.	Yes
The Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989	The Rules shall apply to: (a) An industrial activity in which a hazardous chemical, which satisfies any of the criteria, laid down in Part I of Schedule I or listed in Column 2 of Part II of this Schedule is involved. (b) Isolated storage of a hazardous chemical listed in Schedule 2 in a quantity equal to or more than the threshold quantity specified in Column 3.	Yes
Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996	The Rules provide for mandatory preparation of On-Site Emergency Plans by the industry and Off-Site Plans by the district collector and the constitution of four tier crisis groups at the centre, district, and local levels for the management of chemical disaster.	Yes
Petroleum Act, 1934 (to be read with Petroleum Rules, 2002)	The rule applies to every person intending to transport, store, import, produce, refine or blend petroleum.	Yes

Act and/or Rules	Key Features	Applicability
Static and Mobile Pressure Vessels (Unfired) Rules, 1981	The Rule applies to unit or establishment which fills, stores, manufactures, imports or transports compressed gas in pressure vessel whose water capacity exceeds one thousand litres.	Yes
Forest (Conservation) Act, 1980	<p>The Act is applicable to any project which requires forest land for construction. Depending on the size of the tract to be cleared, clearances are required from the following levels of Government.</p> <ul style="list-style-type: none"> - If the forest exceeds 20 hectares then prior permission of the Central Government is required; - If the forest is between 5 to 20 hectares the regional Office of Chief Conservator is empowered; - If the forest is below or equal to five hectares the State Government may give permission; and, - If the construction area is more than 40 % forest, permission to undertake any work is required from the Central Government, irrespective of the size of the area. 	No (the screening mechanism provides to 'exclude' selection of forest areas or other such environmentally sensitive areas for creation of new TCs)
Biological Diversity Act, 2002	<p>The Ministry of Environment and Forests has enacted the Biological Diversity Act, 2002, following the Convention on Biological Diversity signed at Rio de Janeiro in 1992, of which India is a party.</p> <p>This Act is meant to "provide for the conservation of biological diversity, sustainable use of its components, and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or incidental thereto."</p>	No (the screening mechanism provides to 'exclude' selection of such environmentally sensitive areas for creation of new TCs)

Act and/or Rules	Key Features	Applicability
Bio-Medical Waste (Management and Handling) Rules, 1998	The Rules apply to all persons who generate, collect, receive, store, transport, treat, dispose, or handle bio-medical waste in any form.	No
The Water (Prevention and Control of Pollution) Cess (Amendment) Act, 2003	The Act applies to every industry which includes any operation or process, or treatment and disposal system, which consumes water or gives rise to sewage effluent or trade effluent, but does not include any hydel power unit.	Yes
Noise Pollution (Regulation & Control) Rules 2000	The rule applies to: 1) Industrial area 2) Commercial area 3) Residential area 4) Silence zone (where an area comprising not less than 100 metres around hospitals, educational institutions and Courts may be declared as silence area/zone for the purpose of these rules).	Yes
Batteries (Management and handling) Rules, 2001	The Rule applies to every manufacturer, importer, re-conditioner, assembler, dealer, recycler, auctioneer, consumer and bulk consumer involved in manufacture, processing, sale, purchase and use of batteries or components.	Yes
The Electricity Act, 2003 & The Central Electricity Authority (Measures Relating to Safety and Electric supply) Regulations, 2010	The Act applies to every owner owning or operating or maintaining Electric Plants and Lines including an occupier as defined in Factories Act, 1948.	Yes
Hazardous wastes (Management, Handling and Trans boundary) Movement Rules, 2008	The Rules shall apply to the handling of hazardous wastes as specified in Schedules.	Yes
Ozone Depleting Substances (Regulation and Control) Rules, 2000	The Act applies to person handling Ozone Depleting Substances.	Will be Determined once technical choices are finalised - but unlikely.

Act and/or Rules	Key Features	Applicability
EIA notification on Environment Clearances, 2009	It mandates that certain projects envisaged to be polluting for the environment have to seek prior approval from the Ministry of Environment and Forests to set-up the project. A list of projects along with the procedure required to be undertaken to sought the approval from Government is clearly delineated under the law.	Not likely – but will be ascertained on a case to case basis.
The Scheduled Tribes & Other Traditional Forest Dwellers (Recognition of Forest Rights), 2006	<p>The Act recognizes and vests the forest rights and occupation in forest land in forest dwelling Scheduled Tribes and other traditional forest dwellers who have been residing in such forests for generations but whose rights could not be recorded, and provides for a framework for recording the forest rights so vested and the nature of evidence required for such recognition and vesting in respect of forest land.</p> <p>The definitions of forest dwelling Schedule Tribes, forest land, forest rights, forest villages, etc. have been included in Section 2 of the Act. The Union Ministry of Tribal Affairs is the nodal agency for implementation of the Act.</p> <p>The Act may be applicable in case of forest land used for TC or in the immediate vicinity.</p>	No (the screening mechanism provides to 'exclude' selection of forest areas or other such environmentally sensitive areas for creation of new TCs and therefore this related legal requirement will not apply)
Gas Cylinder Rules, 2004	The Act applies to every person who intends to fills any cylinder with compressed gas or possess, import or transport any cylinder filled with any compressed gases or any person desiring to manufacture cylinders, valves, LPG regulators attached to self-closing valves, multi-function valves and other fitting and also every person in charge of/using gas cylinders.	Yes (may not apply to every TC under the project)

Act and/or Rules	Key Features	Applicability
E-waste (Management and Handling) Rules, 2011	The Rules applies to every producer, consumer or bulk consumer involved in the manufacture, sale, purchase and processing of electrical and electronic equipment or components as specified in Schedule-I, collection centre, dismantler and recycler of e-waste.	Yes
The Ancient Monuments and Archaeological Sites and Remains Act, 1958 & Its amendments till 1992	<p>Under sub-rule 32 of the ancient monuments and archaeological sites and remain rules, 1959 and notification issued in 1992, area up to 100 m from the protected limits and further beyond it up to 200 m near and adjoining protected monument have been declared to be protected and regulated areas, respectively, for purpose of both mining operation and construction.</p> <p>Any repair, addition or alternation and construction / reconstruction within these areas need prior approval of the Archaeological Survey of India.</p> <p>The NOCs is required from ASI Department in case of operating in the immediate vicinity.</p>	No (the screening mechanism provides to 'exclude' selection of such sensitive areas for creation of new TCs)
Workmen's Compensation Act, 1923	The Act applies to every establishment and provides for compensation in case of injury by accident arising out of and during the course of employment.	Yes
Payment of Wages Act, 1936	The Act applies to every establishment and lays down as to by what date the wages are to be paid, when it will' be paid and what deductions can be made from the wages of the workers.	Yes
Minimum Wages Act, 1948	The Act applies to every establishment and mandates that the employer is supposed to pay not less than the Minimum Wages fixed by the State Government.	Yes

Act and/or Rules	Key Features	Applicability
The Public Liability Insurance Act, 1991 and Public Liability Insurance Rules, 1991	The Act mandates companies to take public insurance for its employees	Yes
Trade Unions Act, 1926	The Act applies to every establishment and lays down the procedure for registration of trade unions of workers and employers. The trade unions registered under the Act have been given certain immunities from civil and criminal liabilities	Yes
Maternity Benefit Act, 1951	The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage, etc.	Yes
Employees PF and Miscellaneous Provision Act, 1952	The Act provides for monthly contributions by the employer plus workers	Yes
Contract Labour (Regulation and Abolition) Act, 1970	The Act applies to every establishment and contractor who employs on any day of the preceding twelve months twenty or more workmen and the work performed by the workers shall be for more than one hundred and twenty days in the preceding twelve months and if work is of a seasonal character it is performed for more than sixty days in a year.	Yes
Equal Remuneration Act, 1979	The Act applies to every establishment and mandates that equal payment of wages shall be made for work of equal nature to male and female workers and not for making discrimination against female employees	Yes
Child Labour (Prohibition and Regulation) Act, 1986	The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of child labour is prohibited in building and construction industry	Yes

Act and/or Rules	Key Features	Applicability
Payment of Gratuity Act, 1972	The Act applies to every establishment and mandates that gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation, if an employee has completed 5 years in the establishment.	Yes

3.2 World Bank's Operational Policies (OP)

The World Bank's environmental and social safeguard policies (ten of them) are a cornerstone of its support to sustainable poverty reduction. The objective of these policies is to prevent and mitigate undue harm to people and the environment in the development process. These policies provide guidelines for the identification, preparation, and implementation of programs and projects.

The operational policy discussion pertaining to social safeguards has been described in the Social Management Framework, a standalone document that has been prepared to guide the management of social issues of the project, including those pertaining to resettlement and issues of indigenous communities. The following paragraphs describe the Bank's operational policies and their applicability from an environmental viewpoint.

Environmental Assessment (OP 4.01)

Environmental Assessment is used in the World Bank to identify, avoid, and mitigate the potential negative environmental impacts associated with Bank's lending operations early-on in the project cycle. The policy states that Environment Assessment (EA) and mitigation plans are required for all projects having significant adverse environmental impacts or involuntary resettlement. Assessment should include analysis of alternative designs and sites, or consideration of "no option" and require public participation and information disclosure before the Bank approves the project.

In World Bank operations, the purpose of Environmental Assessment is to improve decision making, to ensure that project options under consideration are sound and sustainable, and that potentially affected people have been properly consulted and their concerns addressed.

The World Bank's environmental assessment policy and recommended processing are described in Operational Policy (OP)/Bank Procedure (BP) 4.01: Environmental Assessment.

Applicability: Yes. Specific interventions (under Component 2) envisaged under the project such as creation of 15 new Technology Centers and upgrading of building and related infrastructure of the existing 18 Tool Rooms may have some potential adverse environmental impacts in the local context. Even though it is expected that the new buildings/blocks would be located within an existing industrial estate or on available government land elsewhere, planning, construction and operation of buildings would require appropriate integration of environment,

health and safety measures to ensure that adverse environmental impacts are minimized and properly managed.

Impacts pertaining to: (a) location (environmental and social features of the site and surrounding land-uses); (b) design (sanitation, water supply, drainage, solid waste arrangements, waste water management, ventilation, access, energy efficiency, material usage, fire safety, storage facility and natural disaster dimension); (c) construction and worksite safety management, including occupational health and safety of construction workers, public safety issues, management of borrow areas and debris/waste material; and; (d) operation/maintenance aspects of physical assets such as buildings, equipment/tools/machinery (such as sanitation and cleanliness/hygiene in the campus and its various facilities, waste management from workshop floor, e-waste management, noise and air pollution from generators and other workshop machinery etc.).would require attention. There is also an opportunity to improve the over-all environmental footprint by creating 'green buildings' or 'greener facilities' under the program.

On other project interventions pertaining to training/curriculum development and testing/developing prototypes the anticipated environmental impacts are not likely to cause any significant or serious damage to natural and physical environment. In fact, the Program offers opportunity to promote improved environmental performance of the selected industrial sectors and safer working practices through introduction of new/ appropriate technology (equipment/machines) and training.

OP 4.01 has been triggered to ensure that all major (like building infrastructure) and minor (tools/equipment/machinery, training and curriculum related) interventions are planned and designed to be environmentally sound by integrating appropriate principles and approaches into the over-all decision making process.

Natural Habitats (OP 4.04)

The policy implementation ensures that Bank-supported development projects give proper consideration to the conservation of natural habitats, in order to safeguard their unique biodiversity and ensure the sustainability of the environmental services and products which natural habitats provide to human society.

This policy is applicable when a project (including any subproject under a sector investment or financial intermediary loan) with the potential to cause significant conversion (loss) or degradation of natural habitats, whether directly (through construction) or indirectly (through human activities induced by the project).

Applicability: No. The physical interventions proposed under the project are not expected to affect natural habitats. No civil works will be financed under the project in designated protected areas/wilderness areas/ critical natural habitats. The environment screening tool will be used to ensure compliance in this regard. Therefore, OP 4.04 is not being triggered for the project.

Forest Policy (OP 4.36)

The implementation of the policy ensures that envisaged forest sector activities and other Bank sponsored interventions which have the potential to impact significantly upon forested areas:

- (a) Do not encroach upon significant natural forest areas that serve important social, environmental or local economic purposes.
- (b) Do not compromise the rights of local communities to continue their traditional use of forests in a sustainable fashion.
- (c) Do not finance commercial logging operations, in the case of primary tropical moist forest, nor any purchase of equipment for this purpose.

Applicability: No. OP 4.36 is not being triggered for this project as no interventions are envisaged in forest areas and therefore no conversion/degradation of this natural resource would occur. Screening mechanism developed as part of the EMF

Pest Management (OP 4.09)

This policy deals with minimization and management of environmental and health risks associated with pesticide use and promotion of safe, effective and environmentally sound pest management.

Applicability: OP 4.09 is not being triggered for this project as biological/environmental control methods or reliance on synthetic chemical pesticides is not envisaged. In case, such a need arises on account of selection of a specific trade/sector (such as Fragrance and Flavours), the requirement is likely to be very limited in nature. In such a scenario, the requirements under the pest management policy of the Bank will be built-in as part of the over-all Technology Centre specific Management/Mitigation Plan to be developed for the center/s in question.

Physical Cultural Resources (OP 4.11)

The World Bank Policy OP/BP 4.11 defines physical cultural resources as movable or immovable objects, sites, structures, groups of structures, natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings, and may be above or below ground, or under water. Their cultural interest may be at the local, provincial or national level, or within the international community.

The Bank assists countries to avoid or mitigate adverse impacts on physical cultural resources from development projects that it finances. The impacts on physical cultural resources resulting from project activities, including mitigating measures, may not contravene either the borrower's national legislation, or its obligations under relevant international environmental treaties and agreements.

The borrower addresses impacts on physical cultural resources in projects proposed for Bank financing, as an integral part of the environmental assessment (EA) process.

Applicability: Yes. By and large, the implementation of the project/program is not likely to affect religious structures of local significance. Screening and site verification protocols will help establish this. However, since civil works are involved, 'chance finds' at work sites is a likely impact that will have to be managed by incorporating appropriate provisions in the bidding/contract documents.

Consultation and Disclosure Requirements (OP 17.50)

The policy requires the borrower to consult key stakeholders, including Project Affected People and local NGOs through the various phases of the project. It requires that groups being consulted be provided on-time, comprehensible and easily accessible information before consultations. The policy also requires that the borrower to make the EA summary available in the state (in a local language) and a public places to all the stakeholders prior to appraisal.

Applicability: For each sub-project/Technology Centre, comprehensive consultations will be required during the design, planning and implementation stages: to determine specific issues; locally viable mitigation measures for addressing environmental impacts and consensus on engineering designs especially where new centers will be established.

Chapter 4 – Existing Environmental Conditions

4.1 Introduction

The Technology Centres/Tool Rooms in the country have been developed to assist small and medium scale enterprises for their technical up-gradation and also providing good quality toolings to meet the growing needs of MSME industries. Some of the existing Tool Rooms in the country have received assistance of countries such as Denmark and Federal Republic of Germany who have provided the sophisticated machines with latest technology. Some of the TCs have also been set up with the assistance of UNIDO/ILO.

These TCs are equipped with latest imported equipment's like CAD/CAM and specialised CNC machines like CNC milling, CNC copy milling, CNC EDM-Sparkerosion, CNC wire-cut, Profile grinding, Jig boring, Jig grinding and Vacuum heat treatment to provide toolings of international standards.

Technology Centres serve the industries through:

a) Tool Design and Production

- i) Design and Manufacture of dies and tools, mould, jigs and fixtures, gauges and tool components (upto1 micron accuracy).
- ii) Computer Aided Design and Computer Aided Manufacturing (CAD/CAM).
- iii) Heat Treatment of all types of steels.
- iv) Quality Control and Testing.

b) Training and Consultancy

- i) Industry based long term training for tool and die makers.
- ii) Short term training for managers & supervisors to upgrade their knowledge and skill.
- iii) Need based technical training for skilled workers/tool makers/machinists etc.
- iv) Training in CNC technology, inspection, quality control testing etc.

The Technology Centres/Tool Rooms are a unique set of institutions that have been designed to serve as training institutions as well have production processes for manufacturing of specific components/moulds serving the needs of specific industries, such as automotive components, pharmaceuticals, hand tools, aerospace industry, Fragrance and flavours and foot ware etc.

Since the Centres are not complete/full manufacturing set-ups by themselves, the environmental impacts of operations are specific to the particular processes adopted for the manufacture of certain parts/tools. While on one part, the technology related aspects form the core of environmental issues in the project, an assessment of existing facilities/centres has brought into fore the issues surrounding the physical infrastructure (buildings and related infrastructure).

4.2 Assessment of Existing Centres

To better appreciate the environmental context and issues associated with functioning of Technology Centres, a limited environment assessment was carried out in six existing Tool Rooms.

The details about the centres covered for the said assessment are presented in the table below.

TC	Activities	Sector/ Products
Fragrance and Flavour Development Centre (FFDC), Kannauj	Serves the Fragrance and Flavour Development sector. The TC have the following services: Provide planting material, consultancy, training, testing, and value addition to the associated farmers and MSMEs including weaker section of the society.	Fragrance and Flavour
Central ToolRoom and TC, Bhubhaneswar	The process includes manufacturing of jigs, fixtures, moulds press tool	Components for aeronautics / space and automotive components
MSME TC (Central Institute of Hand Tools), Jalandhar	This tool is focussed on Design and Development of Hand Tools.	Hand Tools
Institute for Design of Electrical Measuring Instruments (IDEMI), Mumbai	The TC is a Technology Development Centre for 1) Tool & Die Technology Training and Production Centre. 2) Calibration & Testing 3) Research & Development 4) Training	Aero Space instrumentation- Telecommunication, Energy meters, energy testing calibration,
Indo German Tool Room, Aurangabad	The TC is focussed on Tool and die technology training and production centre. The technology used include state of the art CNC machines, hardware, software and automation set up for training and production	Auto components
TC (CFTI, Agra)	Leather and footwear components manufacture	Leather industry

This chapter presents the summary of findings from the field assessment. The findings have been presented in two main heads:

- (a) Physical Infrastructure covering Buildings and Related Infrastructure facilities and
- (b) Technological Aspects

4.2.1 Physical Infrastructure (Buildings and Related Aspects)

The key observations related to physical infrastructure at the Technology Centres/Tool Rooms are presented in the table below:

Parameter	Observation/s	Recommendation/s
TC Fragrance and Flavour Development Centre (FFDC), Kanauj		
Planning and Design	<ul style="list-style-type: none"> ➤ Development and addition of buildings has been happening over the years and therefore greener/environment friendly parameters have not been incorporated in the design. 	<ul style="list-style-type: none"> ➤ A standard framework highlighting possible green building initiatives may be designed for any expansion. ➤ Also, water harvesting within the existing infrastructure/campus can be promoted.
Operation and Maintenance	<p>Regular maintenance of the existing building has scope of improvement:</p> <ul style="list-style-type: none"> ➤ Cracks were visible in the walls of the TC room ➤ Windows were not cleaned and the accumulated dust was restricting the natural light in the TC. 	<ul style="list-style-type: none"> ➤ The patches in the wall may be repaired on annual basis so as to avoid damage to the physical structure. ➤ The windows to be regularly cleaned so as to make more and efficient use of natural light in the TC.
Central TC, Bhubhaneswar		
Planning and Design	<p>The building of TC is an old building but modification/additions have been introduced over a period of time to accommodate more training and workshop requirements. Since, modifications have been carried out over time period, there is no consistency in terms of design, floorings, windows, doors, exit doors etc.</p> <p>The building has natural ventilation and lighting but these can be enhanced by making simple alterations.</p>	<ul style="list-style-type: none"> ➤ A standard framework highlighting possible green building initiatives to be designed for any expansion. ➤ Also, there is large roof area for water harvesting that can be easily utilised.

Parameter	Observation/s	Recommendation/s
	Currently, the scrapyard in the TC is an open yard.	The scrap yard to be covered so as to provide appropriate shelter to stored materials and prevent pollution from run offs during the rains.
Operation and Maintenance	Maintenance of the existing infrastructure at the TC is being carried out.	Many aspects/facets can be further strengthened /improved upon.
TC Central Institute of Hand Tools, Jalandhar		
Planning and Design	Out of the total area, a part of the land is disputed. The disputed land belongs to Punjab Govt. and has not yet been transferred to the Institute.	TC should only be installed at dispute free land to ensure that functioning of the establishment and the program objectives are not marred due to disputes/legal complications.
	The institute has a forging plant which has a forge hammer due to which high vibrations are felt throughout the campus. According to the management, the foundation for hammer has specially been created and insulation material had been put along the foundation at the time of establishment. However, structural stability certificate was not available at the institute.	In case of any change is design and layout a certificate may be taken from a chartered engineer to ensure structural stability despite the change to ensure safety and legal compliance.
	It was observed during the site visit that there are no arrangements for physically challenged people	Appropriate steps may be taken to ensure basic facilities are provided for physically challenged students/staff, like ramp instead of stairs to enter the building and separate toilets.
	It was observed during the site visit that there is no storm water drain system in the campus	A storm water drain may be developed so as to to avoid issues like water logging.

Parameter	Observation/s	Recommendation/s
Operation and Maintenance	The scarp yard maintenance has scope of improvement	The scrap yard may be properly maintained. It may be cleaned regularly and demarcation of different material should be clearly done.
	Sanitation facilities provided in the TC have considerable scope of improvement.	Proper and regular cleaning of the toilets is required in the TC.
TC: Institute for Design of Electrical Measuring Instruments (IDEMI), Mumbai		
Planning and Design	The foundation of the entire setup was done on a marshy land. As a result, the floor of the facility has been slowly sinking year on year basis. During discussions it was told that efforts are being made to fill the gap and maintain floor level but still difference in the level of floor was clearly visible during site visit.	Assessment in terms of physical setting of the area allotted for TC may be thoroughly done so as to ensure that TC is not established on an environment sensitive land or site vulnerable to environment conditions like this.
	Development and addition of buildings has been happening over the years. However, no green building parameter was incorporated in the design.	A standard framework highlighting possible green building initiatives may be designed for any expansion. Also, water harvesting may be practiced within the existing infrastructure.
	Rusting of the raw material and semi-finished / finished products is happening on regular basis at very fast rate thus degrading the product a bit.	A shed with appropriate ambient conditions may be constructed to store raw material as well as finished goods. This shall ensure that degradation of the products due to rusting does not take place and additional expenditure to maintain these products may be avoided.

Parameter	Observation/s	Recommendation/s
Operation and Maintenance	The building of the TC is quite old. Though, refurbishment is done on regular basis, small but insignificant patch of crack were observed in few sections.	The patches in the wall may be repaired on annual basis so as to avoid damage to the infrastructure
	Difference in floor level in certain areas of the TC was noted.	Appropriate levelling exercise may be undertaken to bring the level of the ground to a common level. This has to be done in a manner avoid water logging as has been known to occur in the past.
Indo German Tool Room, Aurangabad		
Planning and Design	It is an old building with additional blocks built over time. The rooms are provided with big windows allowing natural ventilation and light.	Any expansion should be planned considering the green/-er building norms.
	Rain water harvesting is being done at the TC.	None
Operation and Maintenance	Water seepage on roof and certain walls was visible.	Appropriate steps may be taken to ensure maintenance of the infrastructure to avoid water seepage
	The pipe of rain water recharge was found broken/damaged at places thereby defeating the purpose for which it was installed	Appropriate steps may be taken to ensure rain water harvested is either used for some activity with TC or is recharged to the ground.
TC Technology Development Centre (CFTI, Agra)		
Planning and Design	The TC building is well planned with big windows in the rooms to allow maximum utilization of natural light and ventilation.	None

Parameter	Observation/s	Recommendation/s
Operation and Maintenance	The TC has maintained the infrastructure in a good condition	None

4.2.2 Technological Aspects

The key observations related to technological aspects at the Technology Centres/Tool Rooms are presented in the table below:

Parameter	Observation/s	Recommendation
TC Central Institute of Hand Tools, Jalandhar		
General description	Land of the TC is registered in the name of Director of Industries and commerce, Govt of Punjab	NA
	The total built up area of the TC is 6097.22 Sq. Mts	NA
	TC falls in Seismic zone 4	NA
	Sanitation arrangement within the TC include 10 toilets off which 2 are dedicated for women	NA
Resource/ raw material/ productivity	<ul style="list-style-type: none"> ➤ For the hand tool making different grades of steel (Mild Steel, EN-8, EN-31, Die Steel, DIN 2714, Stainless Steel-316) are used; ➤ The installed capacity of the TC is not fully utilized and it was observed that old machinery was being used at the site for production that leads to inefficiency in certain cases 	Appropriate modification may be done in machinery and additional machines may be established in parallel in areas of bottle neck due to an inefficient machine to maximize the production efficiency.

Parameter	Observation/s	Recommendation
Water	<ul style="list-style-type: none"> ➤ The entire source of water is from ground water from bore well ➤ A total of around 70,000 - 80,000 Litre of water per month is used. Flow meter has been installed for the measurement of water consumption at the source but no records have been maintained for the same. ➤ In terms of water conservation measures following initiatives are undertaken: ➤ Recirculation of trade effluent from heat treatment & forge shop to cooling tower has been effected ➤ Also there is partial reuse of water treated by STP plant for plantation ➤ Water Cess: Cess paid to pollution control board. The cess paid is not on actual water consumption but on approximate quantities. 	<ul style="list-style-type: none"> ➤ Other sources of water like water harvesting may be explored. ➤ Records of water consumption may be maintained so as to monitor the water consumption and submit the water cess to SPCB accurately rather than on approximate estimates.
Energy	<ul style="list-style-type: none"> ➤ Energy requirement is met by electricity supply from Punjab State Electricity Board. The TC also uses D.G Sets for back up (Generator Set of 320 KVA and 125 KVA capacities are available); ➤ Electricity consumption of 55000-65000 units per month (approximately) is there; ➤ Two tube lights, each at entry gate and hostel, are powered by solar energy (use solar panels); ➤ Some of the energy conservation measures employed at the TC are: <ul style="list-style-type: none"> - All employees are instructed to switch off all electrical equipment's when not in use. - Improvement of the Power Factor from 0.90 to .95 has been effected. 	<p>Energy saving initiatives like following may be undertaken:</p> <ul style="list-style-type: none"> ➤ Replacement of regular lights with LED ➤ Using star rated products (Energy efficient products)

Parameter	Observation/s	Recommendation
	<ul style="list-style-type: none"> - Heating of Furnace oil by using Micro valve for oil flow control and using Micro Filter type burner has been done at the TC. 	
Waste water	Domestic effluent discharge capped at 3.7m ³ /day. However, discharge quantity is not monitored.	Regular monitoring of the quantity and quality of water effluent may be practices to comply with the legislation
Waste (solid)	Large amount of used oil was found at site kept in over 25 drums. The disposal practice of the same was not clear.	Waste oil is considered as hazardous waste and therefore, should be disposed of to an authorised recycler within 90 days from the date of generation
Environment issues	<ul style="list-style-type: none"> ➤ Air emissions from stack are monitored once every year but the monitoring is not done as per NAAQS; ➤ Ambient air monitoring is carried out on annual basis by third parties. The results show that noise levels in and outside the D.G area and near one and two tonne hammer exceed 75 dBA; ➤ Good housekeeping was not observed at the site and waste material was found to be scattered at many instances. General hygiene of the unit needs a lot of improvement. For housekeeping, currently there are two sweepers have been employed and regular cleaning is done; ➤ In terms of green space and maintenance, some amount of plantations in form of grass, shrubs, and some trees in the front area has been developed. (Exact area not available) 	<ul style="list-style-type: none"> ➤ Air emission monitoring may be done in line with the NAAQS; ➤ Acoustic enclosures may be installed to reduce the level of noise pollution in highlighted areas; ➤ Sweepers may be trained for good housekeeping practices. Also, employees may be encouraged to maintain clean premises; ➤ Effort may be made to increase the green cover with the premises of the TC

Parameter	Observation/s	Recommendation
OHS issues	<ul style="list-style-type: none"> ➤ Forge shop has two hammers of 1 ton and 2 ton. Due to the hammering process high noise and vibrations are produced. According to the reports of noise monitoring conducted by an external agency, Noise levels in the forge shop are of high levels of over 100dbA. Though ear plugs are provided to employees as discussed, usage of PPE was not evident during the visit; ➤ Heat treatment involves primarily two technologies - induction heating and gas carburizing. Both these technologies subject the employees to high temperatures. Both water and oil tanks were at ground level and were found to be open and unmarked. This may lead to fatalities at the site. Employees are provided with PPEs like masks and gloves; ➤ Ventilation at the shop has scope of improvement (through exhaust fans, and other ventilation systems) as fumes/smoke from the furnace was circulating in the shop. ➤ Factories Rules: Incident Accident register maintained in form of loose sheets which are attached to the register and no observations are made in the register ➤ Mock drills and awareness trainings are conducted at the site twice in a year. 	<ul style="list-style-type: none"> ➤ Usage of PPE may be further stressed and efforts including regular training and internal audits may be conducted to strengthen the culture of PPE usage; ➤ Hot water and oil tanks should be properly covered. Also, PPE usage may be further strengthened; ➤ Exhaust fans required for an area may be assessed and the overall capacity may be enhanced. Also, maintenance of the existing exhaust fans may be conducted on regular basis so as to maintain efficiency; ➤ A proper incident accident register may be maintained at site;
Compliance issues	<ul style="list-style-type: none"> ➤ Air Consent: Consent expired on 21-10-2013. Not yet applied for the new consent; ➤ Water Consent: Consent expired on 21-10-2013. Not yet applied for the new consent; ➤ Consent to generate, handle and dispose hazardous waste and e-waste is not available with the TC. 	<p>Application for consent/renewal of consent may be made to the SPCB of the state where TC is operational to be in compliance with the applicable legislation.</p>

Parameter	Observation/s	Recommendation
Others	<ul style="list-style-type: none"> ➤ Signage inside the premises like floor map, fire exit etc. are missing in the TC; ➤ Stagnant water with algal growth was observed in the recirculation drain from gas carburizing area to cooling tower. 	<ul style="list-style-type: none"> ➤ Signage of fire exit, placement of fire extinguisher, EHS related posters, etc. may be put in the TC ➤ Water may be drained or removed from the recirculation drain
TC: Institute for Design of Electrical Measuring Instruments (IDEMI), Mumbai		
General description	Land of the TC is registered in the name of Govt. of India	NA
	The built up area is 5632.32 Sq. Mt	NA
	TC falls in moderate seismic zone	NA
	There are total of 450 windows in the TC. Has 80 Hostels, 15 Messes, 12 no of toilets.	NA
Resource/ raw material/ productivity	<ul style="list-style-type: none"> ➤ The main raw materials used are alloy steel / High Temperature Resistance Alloy Steel, Mild Steel, Stainless Steel of various grades; ➤ From a better design and use of building materials the following are in use: <ul style="list-style-type: none"> a. Aluminium Frame Doors are being used instead of Wooden Frame Doors at major places." b. Particle boards are used for partition purposes. c. Paver Blocks are being used in premises instead of Concrete. 	Appropriate modification may be done in machinery and additional machines may be established in parallel in areas of bottle neck to maximize the production efficiency.

Parameter	Observation/s	Recommendation
	<ul style="list-style-type: none"> ➤ All our Calibration and Testing Laboratories are accredited as per ISO/IEC 17025:2005 by NABL (National Accreditation Board for Testing & Calibration Laboratories), Department of Science and Technology, Government of India. 	
Water	<ul style="list-style-type: none"> ➤ The total fresh water consumption for the year 2012 was 22337 KL and in 2013 up to July it was 13212 KL; ➤ Water analysis is carried out periodically by NABL Accredited Laboratory to check the quality of incoming water; ➤ In terms of water conservation measures following initiatives are undertaken: <ol style="list-style-type: none"> a. Automatic Water Level Monitoring Controllers are used for all water pumps b. Installed Push-Taps in all basins and thereby controlling the excess water consumption 	<ul style="list-style-type: none"> ➤ Other sources of water like water harvesting may be explored.
Energy	<ul style="list-style-type: none"> ➤ 94 nos. of CFL's of 8 watt are provided in place of incandescent lamp in the passage and for machineries in the workshop areas and thereby saving the energy 7850.88 Kwh/year. ➤ 23 nos. of CFL's of 8 watt are used in place of conventional tube lights and thereby saving energy 2914.56 Kwh/year. ➤ 60 nos. of CRT monitors are now replaced by LCD & LED monitors thereby saved energy 10368 Kwh/year. ➤ Capacitor bank is installed in the 11 kV sub-station and improved the power factor from 0.85 to 0.99 and hence the Tata Power Company has given the PF compensation in the billing and thereby saved energy 29280 Kwh/year. 	<ul style="list-style-type: none"> ➤ None

Parameter	Observation/s	Recommendation				
	<ul style="list-style-type: none"> ➤ Automatic Water Level Monitoring Controllers are used for all water pumps and these water pumps are operated after 12.00 midnight. Also, few of the CNC machines are operated in the midnight during the less peak period of usage of electrical energy. ➤ 5 Star rated electrical gadgets like Air-conditioners, Refrigerators are being used. ➤ Wind Operated Turbo Ventilators are used in Canteen and Workshop Passage. ➤ Tri-phosphor coated tube lights are used in all Calibration & Testing Laboratories which gives 30% light intensity than conventional fluorescent tube lights in the same wattage. ➤ 5 Star rated electrical gadgets like Air-conditioners, Refrigerators are being used. ➤ Tri-phosphor coated tube lights are used in all Calibration & Testing Laboratories which gives 30% light intensity than conventional fluorescent tube lights in the same wattage. ➤ Wind Operated Turbo Ventilators are used in Canteen and Workshop Passage. ➤ 60 nos. of CRT monitors are now replaced by LCD & LED monitors. 					
Waste water	Domestic effluent is disposed of in the municipal drain. No monitoring of the quantity or quality is carried out of the same	Regular monitoring of the quantity and quality of water effluent may be practices to comply with the legislation				
Waste (solid)	<ul style="list-style-type: none"> ➤ Solid Waste : <table style="margin-left: 20px; border: none;"> <tr> <td style="padding-right: 20px;">1. Ferrous Scrap</td> <td>8000 kg/ year</td> </tr> <tr> <td>2. Non Ferrous Scrap</td> <td>2000 kg/ year</td> </tr> </table> 	1. Ferrous Scrap	8000 kg/ year	2. Non Ferrous Scrap	2000 kg/ year	EDM oil and hydraulic oil should be disposed of to an authorised recycler within 90 days from the date of generation
1. Ferrous Scrap	8000 kg/ year					
2. Non Ferrous Scrap	2000 kg/ year					

Parameter	Observation/s	Recommendation
	<ul style="list-style-type: none"> ➤ Hazardous Waste is stored in the earmark area <ol style="list-style-type: none"> 1. EDM oil – The waste oil is sold to a local scrap dealer. Instead, this may be disposed of to an authorized dealer to handle hazardous waste to be consistent with legislation. Moreover, there is no consent available from the SPCB for the same 2. Hydraulic oil – It is reused as temporary Anti-rust coating on semi-finished products. Afterwards, the product is cleaned using a cloth. This oil soaked cloth is then disposed along with the normal garbage. The same may be disposed of to an authorized dealer to handle hazardous waste to be in line with legislation. 3. Solid Waste – Being sold to scrap dealers. 4. Canteen Waste – Being feed to earthworms which are nurtured for processing manure. 	
OHS issues	<ul style="list-style-type: none"> ➤ In terms of first aid facility: there were 6 Nos. First-aid boxes provided in Workshop and administration Building and laboratories. However, there are no trained first aiders available in the facility. ➤ 34 Fire Extinguishers are provided at the site in different locations and are regularly checked for pressure by a third party. ➤ Fire hydrants are available but the same is not checked for pressure on regular basis. Also, there is no provision of fire detector/sprinkler/alarm system. ➤ Training on how to use fire extinguishers is conducted once in two years by the third party maintaining the fire extinguishers. 	<ul style="list-style-type: none"> ➤ FIRE NOC may be taken from the authorities; ➤ Usage of PPE may be further stressed and efforts including regular training and internal audits may be conducted to strengthen the culture of PPE usage; ➤ Emergency exit may be clearly marked and the way to emergency exit may not be blocked; ➤ EHS training may be further focused in the TC.

Parameter	Observation/s	Recommendation
	<p>However, there is no Fire NOC available for the facility.</p> <ul style="list-style-type: none"> ➤ In terms of electrical safety: <ul style="list-style-type: none"> a. Separate earth pits are provided for each laboratory and to the major machineries in workshop. Earthing value is maintained better than 0.1 Ohm. b. Surge Suppressor is provided in Tool Room. c. MCB is used for all electrical circuits. ➤ For year 2013: Minor Accidents were recorded namely – 6 nos. ➤ Though, training to operate fire extinguishers is carried out once in two years there are no mock drills conducted at the site. ➤ PPE such as Hand Gloves, Aprons, Industrial Safety Shoes, Ear Plugs, and Safety Goggles are provided to Grinding and Welding Operators but limited use of PPE was visible during the visit. ➤ De-humidifiers are used in CNC Machine area (Milling & EDM sections). ➤ An emergency exit is provided in the workshop however, the same leads to a training room. Further, exits are not marked clearly and some exits were found to be blocked by material. ➤ Training provided at the site does not include topics on EHS aspects 	
Compliance issues	<ul style="list-style-type: none"> ➤ Air Consent: Consent to operate under the legislation is not available. ➤ Water Consent: Consent to operate under the legislation is not available. 	Application for consent may be made to the SPCB of the state where TC is operational to be in compliance with the applicable legislation.

Parameter	Observation/s	Recommendation
	<ul style="list-style-type: none"> ➤ Consent to generate, handle and dispose hazardous waste and e-waste is not available with the TC; ➤ A factory license valid up to 31/12/2013 is available. The license allows employment of 150 people. Current strength of employees is 139 (excluding 24 apprentices and 622 students) 	
Others	<ul style="list-style-type: none"> ➤ Signage inside the premises like floor map, fire exit etc. are missing in the TC; 	<ul style="list-style-type: none"> ➤ Signage of fire exit, placement of fire extinguisher, EHS related posters, etc. may be put in the TC .
Indo German Tool Room, Aurangabad		
General description	Land of the TC is registered in the name of Indo German Tool Room on a lease of 99 years.	NA
	Total campus area is around: 51878 Sq. Mts. Out of this total constructed area is 18879.5 Sq. Mts and construction is on-going on 3092 sq.mts	NA
	Has a separate ramp at the main entrance for the physically challenged	NA
	Has the following management systems for management of environment aspects: ISO 9001:2008, ISO 29990:2010, ISO 14001:2004, BS OHSAS 18001:2007, ISO/IEC 17025:2005 NABL accredited calibration lab tool room and training centre. NABL accredited calibration lab tool room and training centre	NA

Parameter	Observation/s	Recommendation
	There are a total of 32 toilets with 6 for women	NA
Resource/ raw material/ productivity	<ul style="list-style-type: none"> ➤ Raw materials used include: Alloy steel, tool steel and nonferrous materials as per the requirements of production 	None
Water	<ul style="list-style-type: none"> ➤ The total fresh water consumption is 2896 KL/month; ➤ Water analysis is carried out periodically by NABL Accredited Laboratory to check the quality of incoming water; ➤ Water harvesting is practiced in the TC ➤ In terms of water conservation measures following initiatives are undertaken: <ol style="list-style-type: none"> a. Automatic Water Level Monitoring Controllers are used for all water pumps b. Installed Push-Taps in all basins and thereby controlling the excess water consumption 	<ul style="list-style-type: none"> ➤ None
Energy	<ul style="list-style-type: none"> ➤ The source of energy is predominantly electrical sourced from the grid. Apart from this energy is also sourced from in-house D.G sets. (DG sets: 350 kva 2 nos) There has been installation of solar panel and solar water heaters at the hostel facilities. ➤ Some of the energy conservation measures employed are : <ol style="list-style-type: none"> 1. Evaporated Air cooling system energy savers equipment are installed instead of Split A/C and the centralised A.C System have been incorporated in the design stage for the CNC training workshop, CAD/CAM ," 2. VLSI, mechatronics labs etc. These have resultant energy saving as much as 80% as compared to split AC (360000 units/ year saved). 	<ul style="list-style-type: none"> ➤ None

Parameter	Observation/s	Recommendation
	<ol style="list-style-type: none"> 3. Have installed solar energy system – namely solar water heaters for hot water facility in the hostel buildings and also in the residential campus 4. In total through various measures there have been apex: 600000 units /year of energy saved in the last 3 years. 5. There have been replacement of CFL instead of tube/HPSV and other bulbs in the entire IGTR premises. (CFLs consume 50% less energy compared to HPSV lamps. 6. Eliminating power factor penalty – 350 KVAR RTPFC (Real Time Power Factor Correction) are installed and Capacitor Banks installed in training since the last 5 years to maintain the unity power factor resulting in incentives on monthly energy bills (energy savings 10% per moth) 7. Proposed procurement actions are as follows: <ol style="list-style-type: none"> A. Proposed to procure evaporated Air Cooling System for balance portion of CNC training workshop, Mechatronics and CAD/CAM Labs. B. Energy efficient Street lamps by CFL/LED lamps C. RTPFC panel for electrical load exceeding in production and training workshop D. Installation of solar energy systems like solar heaters and Street lamps in phased manner. 	
Waste water	<ul style="list-style-type: none"> ➤ Waste water generated: 1531 KL/month ➤ Waste water collected is channelled through the pipeline connected to CIDCO civil line. ➤ Waste water is tested for basis parameters like BOD, etc. 	None

Parameter	Observation/s	Recommendation
	There is not much production related waste water	
Waste (solid)	<ul style="list-style-type: none"> ➤ The TC generated the following HW categories: ➤ Hazardous waste- Oil from lubrication and cooling of machnies:12960 Litres ➤ Other solid waste include <ul style="list-style-type: none"> - Ferrous scrap 45453 kg - Non-ferrous scrap: 16734 kg ➤ Hazardous waste is stored in the separate area and is disposed of two authorised 3rd party dealers ➤ E-waste is just being taken into account recently for collection and disposal. 	E-waste may be disposed of to an authorised dealer
OHS issues	<ul style="list-style-type: none"> ➤ Fire and safety systems are in place. ➤ First aid kit with basic first aid medicines and material was present in the shop floor. Maintained as per the Factories Act" ➤ Safety training, Signages, on the job training etc. on HSE aspects are provided to employees. EHS aspects are also covered as a part of the induction programmes for all students; ➤ First aid and safety aspects need to be strengthened including access to fire extinguishers at the workplace 	<ul style="list-style-type: none"> ➤ Usage of PPE may be further stressed and efforts including regular training and internal audits may be conducted to strengthen the culture of PPE usage
Others	<ul style="list-style-type: none"> ➤ EHS policy may be communicated to all the employees ➤ In general the housekeeping and maintenance was found to be good. 	

Parameter	Observation/s	Recommendation
TC Technology Development Centre (CFTI, Agra)		
General description	Land of the TC is registered in the name of Director of the TC	NA
	The total campus area is 7214 Sq. Mts and the hostel area of 4778 Sq. Mts. The total built up area: Campus: 3123Sq.Mtrs; Hostel: 1632Sq.Mtrs	NA
	50% of campus has open area for greening activities	NA
	There are a total of 6 toilets out of which 3 are for women	NA
Resource/ raw material/ productivity	<ul style="list-style-type: none"> ➤ Leather & Footwear Components ➤ Minimum wastage by latest technology 	None
Water	<ul style="list-style-type: none"> ➤ The entire source of water is from ground water from bore well. ➤ Water consumption: <ul style="list-style-type: none"> - Campus: <ul style="list-style-type: none"> a. Summer: 2,50,000 per Litres/month b. Winter: 50,000 Litres/ month - Hostel: <ul style="list-style-type: none"> a. Summer : 1,35,000 Litres/month b. Winter: 75,000 Litres/month ➤ Reverse Osmosis (RO) process for water facility 2 numbers available in the Institute and one at the hostel ➤ RO Plant for drinking water is monitored for pH level testing done every year by local bodies. 	<ul style="list-style-type: none"> ➤ Other sources of water like water harvesting may be explored; ➤ Records of water consumption may be maintained so as to monitor the water consumption and submit the water cess to SPCB accurately

Parameter	Observation/s	Recommendation
	<ul style="list-style-type: none"> ➤ Water Cess: Cess paid to pollution control board. The cess paid is not on actual water consumption but on approximate quantities. 	
Energy	<ul style="list-style-type: none"> ➤ Energy requirement is met by electricity supply from State Electricity Board. The TC also uses D.G Sets for back up (Generator Set of 63 KVA and 25 KVA capacities are available); ➤ Sanction Load : 250 KVA Used : 180 KVA 	<p>Energy saving initiatives like following may be undertaken:</p> <ul style="list-style-type: none"> ➤ Replacement of lights with LED ➤ Using star rated products (Energy efficient products)
Waste water	Domestic effluent discharge capped is not monitored	Regular monitoring of the quantity and quality of water effluent may be practices to comply with the legislation
Waste (solid)	<ul style="list-style-type: none"> ➤ Waste categories include: wastes from office, canteen/mess, workshop and e-waste) ➤ Quantity of the generated waste is not being monitored. The waste type generated from the facility are: <ol style="list-style-type: none"> a. Leather waste – Burned outside the premises b. Waste generated from shoe sole manufacturing is Dumped in open outside the premises c. Waste oil – Given to local authorised vendor d. Paper waste – Disposed with general waste" 	Leather waste may not be burnt and waste from shoe sole manufacturing may be properly collected and disposed in an appropriate mmaner
Environment issues	<ul style="list-style-type: none"> ➤ Good housekeeping was observed at the site; ➤ Green space and maintenance was maintained in a good condition 	<ul style="list-style-type: none"> ➤ None

Parameter	Observation/s	Recommendation
OHS issues	<ul style="list-style-type: none"> ➤ Fire extinguishers are placed throughout the facility. Also fire hydrant is installed. ➤ Electrical safety arrangements are in place. Separate electricity cut out panels for every department in electricity room. ➤ Silicon vapours are used in the sole manufacturing. ➤ No mock drills are conducted in the facility 	<ul style="list-style-type: none"> ➤ Usage of PPE may be further stressed and efforts including regular training and internal audits may be conducted to strengthen the culture of PPE usage; ➤ The operator may be provided with fumes mask to safeguard from silicon vapours ➤ A proper incident accident register may be maintained at site;
Others	<ul style="list-style-type: none"> ➤ Signage inside the premises like floor map, fire exit etc. is missing in the TC. 	<ul style="list-style-type: none"> ➤ Signage of fire exit, placement of fire extinguisher, EHS related posters, etc. may be put in the TC
TC Fragrance and Flavour Development Centre (FFDC), Kanauj		
General description	The land is registered in the UP Govt. Revenue record and is owned by Fragrance & Flavour Development Centre (FFDC)	NA
	The total campus area is 8.5 Hectare of which the built up area is 8187 Sq. Mt.	NA
	System followed as per ISO 14001 and document are available.	NA
	There are a total of 4 toilet facility off which 2 for females	NA
Resource/ raw material/ productivity	<ul style="list-style-type: none"> ➤ Raw materials used are plant material (Aromatic Plant & Essential Oils), Aroma Chemicals (Natural & Synthetic Origins) 	None

Parameter	Observation/s	Recommendation
Water	<ul style="list-style-type: none"> ➤ Source of water for the TC is Ground water (2 borewells). The TC is located in water rich area with the river Ganga at 25 km. Water consumption is currently not being monitored. ➤ Water softener installed for water used in boiler. ➤ Water from process is recirculated in cooling towers. Exact quantity is not monitored ➤ Water Cess: Cess paid to pollution control board. The cess paid is not on actual water consumption but on approximate quantities. 	<ul style="list-style-type: none"> ➤ Other sources of water like water harvesting may be explored. ➤ Records of water consumption may be maintained so as to monitor the water consumption and submit the water cess to SPCB
Energy	<ul style="list-style-type: none"> ➤ Artificial light required in growth chamber of plant tissue culture lab. ➤ At some places, tube lights have been replaced with CFLs. ➤ New ACs which were bought by the institute are of five star rating level. Beyond this no other initiative has been taken at the unit. 	<p>Energy saving initiatives like following may be undertaken:</p> <ul style="list-style-type: none"> ➤ Replacement of lights with LED ➤ Using star rated products (Energy efficient products)
Waste (solid)	<ul style="list-style-type: none"> ➤ Agriculture Waste – Utilized in making Green manures & fuel for field distillation Unit. ➤ Chemical Waste – Utilized in making low grade fragrances for Agarbatti, Dhoopbatti, etc. Used oil is used for manufacturing of low grade fragrances. ➤ Scrap collected and stored in scrap yard. ➤ Office waste - Bio-degradable and Non-bio-degradable. 	None

Parameter	Observation/s	Recommendation
	<ul style="list-style-type: none"> ➤ Bio-degradable waste is utilized for farmyard manures with Agricultural waste utilized in fields. ➤ Non-bio-degradable waste is collected by Nagar Palika Parishad, Kannauj in weeks. ➤ Canteen Waste – Initially wastes of canteen is collected in campus & finally collected by Nagar Palika Parishad, Kannauj weekly. 	
Waste water	Waste generated through condensation process & collected in Nallah and planning to utilized in irrigation of crops. Disposed into drain (sewage drain passes through the campus).	None
Environment issues	<ul style="list-style-type: none"> ➤ Noise pollution created by generators but it is under control measured by Hitech Research Centre, New Delhi for noise monitoring, ➤ Air quality, Stack Emission in D.G. Sets, have been done on 23.06.2013. 	<ul style="list-style-type: none"> ➤ Air emission monitoring may be done in line with the NAAQS; ➤ Acoustic enclosures may be installed to reduce the level of noise pollution in highlighted areas; ➤ Sweepers may be trained for good housekeeping practices. Also, employees may be encouraged to maintain clean premises; ➤ Effort may be made to increase the green cover with the premises of the TC
OHS issues	<ul style="list-style-type: none"> ➤ As per ISO Standards, Centre has emergency area and a team of emergency response. However no emergency response plan has been formally put in place. <ul style="list-style-type: none"> - First Aid box is available in the quality control block. - Safety trainings are conducted by an external agency. 	<ul style="list-style-type: none"> ➤ Usage of PPE may be further stressed and efforts including regular training and internal audits may be conducted to strengthen the culture of PPE usage.

Parameter	Observation/s	Recommendation
	<p>However, it was last conducted in Aug 2012.</p> <ul style="list-style-type: none"> - Fire Extinguisher in workshop Pilot Plant & Labs. - Fireproof Switches installed at Pilot Plant where the solvents are used. - MCBs at all departments/ labs / sections. - However there is no record maintenance with respect to injuries and accidents. - Mock drill training organised by the Police Fire Service Department, Kannauj & ISO team in 2010 & 2012 respectively. 	<ul style="list-style-type: none"> ➤ Hot water and oil tanks should be properly covered. Also, PPE usage may be further strengthened; ➤ Exhaust fans required for an area may be assessed and the overall capacity may be enhanced. Also, maintenance of the existing exhaust fans may be conducted on regular basis so as to maintain efficiency. ➤ A proper incident accident register may be maintained at site.
TC Central Tool Room and Training Centre, Bhubaneswar		
General description	The land has been registered under the name of CTTC, Bhubaneswar on lease for a period of 99 years.	NA
	Total Campus area is 12.91 acre off which 2.89 acres has been recently bought. Out of which the total built up area is 10553 sq mt.	NA
	A total of 52 toilets exist inclusive of the ones for hostel and staff quarters. Off which 9 are for women.	NA
Resource/ raw material/ productivity	Steel: MS steel, M2 (mild steel), high carbon high chromium steel, N31 and N8, P20. Aluminium for fixtures and moulds.	None

Parameter	Observation/s	Recommendation
Water	<ul style="list-style-type: none"> ▪ Water is completely sourced from bore wells (3 numbers) within the campus. The water pumped out is processed for drinking water purposes ▪ Currently the water consumption of the TC is 364500000L/year. There are no water meters but records are maintained in terms of water pumped and stored on a regular basis for supply. ▪ "Drinking water treatment plant is available at site. This includes sand bed filtration and sedimentation post which water purification systems have been placed at the receipt points ▪ Drinking water quality is also being tested annually by an authorised lab on parameters such as : Ph, Total suspended solids, Total dissolved solids, Biological oxygen demand, Chemical oxygen demand, and oil and grease ▪ Currently there are rain water harvesting systems (3 roof top systems)- canteen, trg building, lecture block with a pit and recharge of the GW.. 	<ul style="list-style-type: none"> ➤ Since there is large roof area there is further scope to put in rain water harvesting systems
Energy	<ul style="list-style-type: none"> ▪ The major source of energy is electricity sourced form the grid system. ▪ "Consumption of electricity from the grid. in 2013-2104: were 1422832 kwhr . ▪ In terms of energy conservation measures, individual A/C have been installed instead of an central A/C system. ▪ Revenue earned thro units saved 281712 kwhr ▪ Some of the energy conservation measures taken have been: replacement of regular lighting systems to LED/ CFL ▪ Solar energy is being tested on a pilot scale currently. 	<ul style="list-style-type: none"> ➤ Full operation on solar systems

Parameter	Observation/s	Recommendation
	<ul style="list-style-type: none"> ▪ Individual Ac systems instead of central A/C system ▪ Energy management systems are also being planned in the forthcoming years 	
Waste water	<ul style="list-style-type: none"> ▪ Waste water categories include: Toilet and sanitary water used and water generated from process floor cleaning. ▪ The work shop floor water has a mix of water contaminated with oils and this as an effluent is checked annually once before discharge into the drains. Shop floor water is also discharged into drains after checking for key parameters. ▪ Soak pit is available (3) international, canteen and hostel no 2. ▪ Go to the soak pit (sludge is given to municipality) 	
Waste (solid)	<ul style="list-style-type: none"> ▪ Wastes that are Recycled : metal, paper, al, steel, Beryllium copper (Aero -space. satellite components) ▪ Hazardous wastes that are generated: <ol style="list-style-type: none"> 1. Cotton waste, waste oil. 2. Hazardous waste is stored in the separate year marked area " 3. Solid waste as scrap is disposed in a separate open scrap yard and the comprehensive list is not available 4. Waste is disposed through authorized agencies. 5. Metals on a tender basis 6. Lube oil (other agency) 7. Others ▪ Currently in the region there are no agencies for e-waste. ▪ The TC is in discussion with forums on this matter. Also having buy back from computer supplier. 	<ul style="list-style-type: none"> ➤ To improve on the storage/ scrap yard of waste with roofing and floor. ➤ Also to maintain a register as per waste type and categories for generation and disposal. ➤ To identify 3rd party dealers for e- waste management

Parameter	Observation/s	Recommendation
Environment issues	<ul style="list-style-type: none"> ➤ There is no emission intensive process and hence air pollution is not a significant environmental aspect. ➤ DG sets for back-up energy are being used and air pollution form this source could be monitored. 	<ul style="list-style-type: none"> ➤ Air and Noise aspects from the use of DG sets for back of energy needs to effected.
OHS issues	<ul style="list-style-type: none"> ➤ First aid kit with basic first aid medicines and material was present in the shop floor and is maintained as per the Factories Act ➤ Fire extinguishers have been placed inside all buildings and maintained as per the Factories Act. Mock and Fire drills are carried out twice a year ➤ In terms of safety records, the records of injuries/ accidents on the workshop, production floor are maintained. These are currently manually maintained. 	<ul style="list-style-type: none"> ➤ Safety records, the records of injuries/ accidents on the workshop, production floor are maintained these can be upgraded to be maintained in excel form for easy review.
Compliance issues	<ul style="list-style-type: none"> ➤ Has ISO 14000 compliance for Environment management systems. 	ISO 14000 certified

Chapter 5 – Potential Environmental Issues

5.1 Introduction

Apart from the specific issues presented in the previous chapter as part of the site assessment findings, it is essential to list out clearly the Environment, Health and Safety (EHS) issues related to:

- (a) Physical Infrastructure development, including expansion/Upgrading of existing TCs and establishment of new TCs and
- (b) Technological Aspects

A screening followed by specific assessment, including risk identification exercise shall be conducted for each Technology Centre once decisions related to site and/or technology selections are made.

5.2 Physical Infrastructure

The EHS issues related to Planning and Design phase, the construction phase and operation and maintenance phase are envisaged to be common for all the tool rooms except in cases where additional maintenance work may be required due to certain prevailing conditions at the site. Snapshot of key possible issues related to the expansion or the development of new tool rooms is highlighted in the following sections.

5.2.1 Planning and Design

Planning and designing are the core activities of any expansion and/or a green field project and most of the issues can be avoided if certain precautions are taken during the planning and design stage itself. Aspects and/or hazards which may be focused during this process are as follows:

SI. No	Aspect	Associated impact/s	Recommendations for mitigation/management
Site selection			
1	Natural setting like coastal area, hilly area, etc.	High moisture in coastal area may lead to : a) Fast rusting of equipment b) Uncomfortable working conditions	<ul style="list-style-type: none">➤ Finished and semi-finished products should be kept in control environment do avoid rusting;➤ Appropriate cooling and heating arrangements should be made to maintain appropriate working condition for the employees

SI. No	Aspect	Associated impact/s	Recommendations for mitigation/management
		Salt ingress in coastal area limiting quality of ground water. This may be an issue in case municipal supply is limited or not available and TC is dependent on ground water.	<ul style="list-style-type: none"> ➤ Water harvesting may be practiced at the site to reduce dependency on ground water to certain extent; ➤ Alternate sources of water may be identified so as to meet the requirement in certain situations
		Prone to natural calamity like Floods, Tsunami, Cyclones, etc. resulting in damage to property and loss of life	<ul style="list-style-type: none"> ➤ Alternate options should be evaluated to set-up tool room in case the identified site is in high danger zone. In case alternate is not available, appropriate arrangements should be made so as to have early warning from relevant department; ➤ Building structure should be made strong enough to sustain certain degree of natural calamities like earthquake, cyclones, etc.
		Marshy land which may result in lowering level of floor over the period of time thereby leading to: a) uneven plain requiring additional expenditure b) Loss of property c) Choked drains or filling of water in low level areas thereby damaging equipment	<ul style="list-style-type: none"> ➤ Foundation of the building shall be appropriately prepared so as to ensure that the level of floor of the building remains constant over the period of time
2	Agriculture land converted for use	Loss of agricultural fertile land	<ul style="list-style-type: none"> ➤ Alternate land should be identified for development; ➤ Only in case of setting up tool room for sectors like Fragrance and Flavour (which involves cultivation of crops) such land may be appropriate.

SI. No	Aspect	Associated impact/s	Recommendations for mitigation/management
3	Inappropriate resettlement and rehabilitation	<ul style="list-style-type: none"> a) Poor condition of relocated people leading to conflict b) Additional expenditure towards relocation c) Disturbed operations d) Encroachment of TC land 	<ul style="list-style-type: none"> ➤ A resettlement and rehabilitation shall be framed with the help of an external agency so as to ensure proper compensation in line with "The Right to Fair Compensation and Transparency in Land Acquisition and Resettlement Act, 2013".
4	Water intensive industry like distillery in the vicinity and/or poor availability of water in the area	<ul style="list-style-type: none"> a) May lead to interrupted or limited supply of water from municipality b) In case of dependency on ground water, availability in long run may become a challenge 	<ul style="list-style-type: none"> ➤ Water harvesting should be incorporated in the design planning; ➤ Alternate sources of water may be identified so as to ensure sustained availability
5	Located near bio-reserve, natural habitats	May impact the biodiversity in these areas in case of a polluting sector like foundry, Fragrance and flavours, etc.	<ul style="list-style-type: none"> ➤ Pollution control equipment like, air precipitator, waste water treatment, etc. should be installed in the TC; ➤ An assessment may be undertaken to identify places like bio-reserve, natural habitats, etc. and the possible impact due to the TC operations on them;
6	Located near Archaeological ly sensitive sites	May prove detrimental to the archaeological site in case it is situated in vicinity of possible impact	<ul style="list-style-type: none"> ➤ Pollution control equipment like, air precipitator, waste water treatment, etc. should be installed in the TC; ➤ Permission may be sought from Archaeological survey of India before setting up of TC in case the same is in the vicinity

SI. No	Aspect	Associated impact/s	Recommendations for mitigation/management
7	Site having religious structure or structures of cultural importance	Damage to religious structure or structures of cultural importance	<ul style="list-style-type: none"> ➤ All necessary and adequate care shall be taken to minimize impact on cultural properties which includes cultural sites and remains, places of worship including temples, mosques, churches and shrines, etc. graveyards, monuments and any other important structures as identified during design; ➤ Access to such properties from the road shall be maintained clear and clean
Acquisition of land			
1	Acquisition of land from people	Loss of land, livelihood, assets, etc	<ul style="list-style-type: none"> ➤ The Company shall conduct meaningful consultations with affected people in the issues of land acquisition, or loss of livelihood, if any ➤ Compensation for land and any existing assets shall be negotiated on the basis of current Government norms ➤ Avoid farming season wherever possible for the acquisition ➤ Giving priority in jobs to the local people with first priority given to the project affected family
Temporary use of land to store construction material			
1	Material storage at site	Impact on water and soil	<ul style="list-style-type: none"> ➤ The equipment and construction material shall be placed at least 500m away from water bodies (if any), natural flow paths and residential areas ➤ Equipment and materials shall be stored at designated areas with concrete flooring/wooden pallet to avoid any spillages which may lead to soil or ground water contamination.

5.2.2 Construction

The activities and anticipated EHS issues during the construction phase are highlighted in the following sections:

Activity	Associated impact/s	Recommendation for mitigation
Clearing of land (including removal of shrubs and other vegetation)	Soil erosion	<ul style="list-style-type: none"> ➤ It shall be ensured that the construction activity immediately follows the clearing of land to avoid soil erosion.
Excavation, drilling and levelling for the construction of foundation and base of building and roads	Air pollution	<ul style="list-style-type: none"> ➤ Water sprinkling at regular intervals during excavation and drilling activities shall be practiced to avoid generation of dust; ➤ The excavated soil should not be stored in the direction of the wind and covers to be provided for loose construction material; ➤ Activities like digging and filling are to be avoided in conditions of very high wind; ➤ Construction machinery shall be properly maintained to minimize exhaust emissions of CO, SPM and Hydrocarbons.
	Soil erosion/Loss of Top soil	<ul style="list-style-type: none"> ➤ Effort should be made to use the overburden within premises for landscaping; ➤ During levelling, gradation across the land (If any) should be reduced to the extent possible.
	Noise pollution	<ul style="list-style-type: none"> ➤ Regular maintenance of plant equipment shall be carried out; ➤ Noise prone activities are to be undertaken during day time and shall be avoided, to the extent possible, during night time; ➤ Personal protective equipment shall be provided for workers performing drilling at site
	Occupational health hazards	<ul style="list-style-type: none"> ➤ Provision of adequate personal protective equipment like safety helmets, face masks, safety shoes, safety goggles etc. for the safety of workers; ➤ The excavated area should be provided with a visible boundary (Usually created using a tape and sticks) to ensure safety at site; ➤ Training shall be imparted to workers on occupational safety and technical aspects of job undertaken by them

Activity	Associated impact/s	Recommendation for mitigation
	Disposal of debris and other wastes	<ul style="list-style-type: none"> ➤ The waste and debris should be disposed of at an identified place preferably wasteland and appropriate approval should be taken for the same from land owner or revenue authorities; ➤ The disposal site should be at least 1000 meters away from the areas including notified forest land, water bodies and productive lands;
Establishing labour camp (Provision of civic amenities for construction labour and movement of truck drivers for transporting construction material shall be provided at the site. The labour camps at the project site will be temporary in nature)	Health Risks	<ul style="list-style-type: none"> ➤ Provision of separate mobile toilet facilities for men and women shall be made; ➤ The domestic effluent shall be properly disposed of in soak pits; ➤ Contractor shall provide garbage bins to all workers' accommodation for dumping wastes regularly in a hygienic manner in the area; ➤ First aid box should be provided at every construction campsite and under the charge of a qualified person to provide first aid. Availability of such person should be ensured at all time. The first aid box should contain the following in case of less than 50 workers at the site: <ul style="list-style-type: none"> i) Twelve small sterilized dressings. ii) Six medium size sterilized dressings. iii) Six large size sterilized dressings. iv) Six large size sterilized burn dressings. v) Six (1/2 oz.) packets sterilized cotton wool. vi) One (2 oz.) bottle containing a 2 per cent alcoholic solution of iodine. vii) One (2 oz.) bottle containing sal-volatile having the dose and mode of administration indicated on the label. viii) One roll of adhesive plaster. ix) One snake-bite lancet. x) One (1 oz) bottle of potassium permanganate crystals. xi) One pair of scissors. xii) One copy of the first-aid leaflet approved by the Chief Inspector of Factories.
	Chances of spread of sexually transmittable diseases like AIDS	<ul style="list-style-type: none"> ➤ Awareness programmes to be conducted regularly for workers on AIDS, and other health related issues; ➤ Health check-up facilities for employees and contract workers

Activity	Associated impact/s	Recommendation for mitigation
	Water pollution	<ul style="list-style-type: none"> ➤ Separate mobile toilet facilities shall be made available for male and female workers. The domestic effluent shall be properly disposed of in soak pits. ➤ Adequate drinking water facilities, sanitary facilities and drainage in the temporary sheds of the construction workers should be provided to avoid the surface water pollution.
	Land contamination	<ul style="list-style-type: none"> ➤ Basic sanitary facilities shall be provided for the workers staying at the labour camp and at the project site. ➤ Dustbins shall be provided at the camp by the contractor
Movement of vehicles (Vehicle movement shall prevail at the site to transfer the material and workers at site. Apart from this, third party vehicles delivering the material and equipment shall also be there.)	Air pollution	<ul style="list-style-type: none"> ➤ All the vehicles entering the site to be asked to have updated PUC (Pollution under control) certificate. ➤ Vehicle speed is to be restricted to 15km/hour at site ➤ Trucks/dumpers are to be covered by tarpaulin sheets during off site transportation of friable construction materials and spoil ➤ Maintenance of vehicles shall be carried out regularly ➤ Sprinkling of water shall be practiced at the site
	Soil contamination	<ul style="list-style-type: none"> ➤ Proper maintenance of vehicle shall be carried out to avoid any leakage of oil or grease
	Water contamination	<ul style="list-style-type: none"> ➤ Proper maintenance of vehicle shall be carried out to avoid any leakage of oil or grease
	Safety risks	<ul style="list-style-type: none"> ➤ Vehicle speed is to be restricted to 15km/hour at site; ➤ Necessary safety trainings shall be provided to the drivers of construction vehicles for speed restrictions and do's and don'ts to be followed during movement of construction vehicles

Activity	Associated impact/s	Recommendation for mitigation
Use of D.G set (D.G sets shall be used at site to provide electricity to labour camps in the night time. Also, in case of non-availability of power from grid, D.G sets shall be used to provide electricity at the site for construction activity)	Air pollution	<ul style="list-style-type: none"> ➤ D.G set to be optimally used with proper orientation and adequate stack height; ➤ Stack monitoring carried out on regular basis; ➤ Proper maintenance of the DG Set carried out on regular basis
	Noise pollution	<ul style="list-style-type: none"> ➤ Acoustic enclosures are to be provided with the D.G sets to minimize the noise levels
Storage of diesel (Diesel shall be stored on-site so as to ensure availability for D.G sets)	Soil contamination	<ul style="list-style-type: none"> ➤ A covered area shall be defined for storage of HSD with concrete flooring
	Safety risks	<ul style="list-style-type: none"> ➤ The diesel storage area shall not be proximity of the labour camps; ➤ Inflammable substance shall not be allowed at the project site.
Handling of waste (During construction phase there may be generation of both hazardous and non-hazardous waste which needs to be carefully handled to ensure environment safeguard)	Land contamination and Water contamination	<ul style="list-style-type: none"> ➤ Waste shall be stored at designated place after segregation on the basis of category (hazardous and non-hazardous); ➤ Hazardous waste shall be disposed of to the authorized vendors only; ➤ A waste management plan shall be chalked out to properly dispose the debris generated from the site.
	Safety risks	<ul style="list-style-type: none"> ➤ Adequate PPE's shall be identified and provided to the workers at site.
Installation and operation of concrete mix plants and batching plants (In case, these are installed on temporary basis at the project site)	Noise pollution	<ul style="list-style-type: none"> ➤ Noise shielding to be used where practicable and fixed noise sources to be acoustically treated for example with silencers, acoustic louvers and enclosures; ➤ Provision of make shift noise barriers near high noise generating equipment to minimize horizontal propagation of noise in case of residential area in the vicinity

Activity	Associated impact/s	Recommendation for mitigation
Construction labour management	Child labour and forced labour	<ul style="list-style-type: none"> ➤ Provision of clause in contractor's agreement that bans child labour and forced labour at project site; ➤ Adequate procedures to avoid or prevent hiring/entry of child labour at the project site; ➤ Random check to be undertaken at the site.
	Health and safety risks for children of workers	<ul style="list-style-type: none"> ➤ Temporary crèche facility may be provided in case of migrant labourers children residing in the camps to ensure safety
	Water wastage	<ul style="list-style-type: none"> ➤ Emphasis shall be given on optimization of water usage and supply of potable drinking water for labour camps
	Pressure on forest produce	<ul style="list-style-type: none"> ➤ Fuel shall be made available to construction workers so as to reduce pressure on forest produce or local fuel wood resources

5.2.3 Operation and Maintenance

There are a number of environment aspects and health and safety hazards which may arise during operations and due to negligence towards appropriate maintenance work in a TC. A snapshot of potential aspects and hazards are as follows:

Potential impact	Recommendation for Mitigation
Deterioration of the structure over the period of time	<ul style="list-style-type: none"> ➤ Maintenance and repair work should be carried out on regular basis to slow down/mitigate the deterioration of the structure. ➤ A structural stability certificate should be taken from a chartered engineer every 5 years. ➤ Any change in the layout of the equipment, bringing heavier machinery in place of a small one or putting more number of machinery in a particular place, should be approved by the chartered engineer to ensure that the modification in layout is not going to impact the stability of the structure.
Water contamination	<ul style="list-style-type: none"> ➤ Cleaning of the terrace of the building should be practiced so as to ensure that the rain water collected through water harvesting is not contaminated. Alternatively, first rain harvest should be washed through the storm water drain in case of rain abundant area.
Fire risk	<ul style="list-style-type: none"> ➤ Fire extinguishers shall be checked for pressure on annual basis.

Potential impact	Recommendation for Mitigation
	<ul style="list-style-type: none"> ➤ Fire hydrant system should be checked once in six months to ensure it is operational; ➤ Electrical wiring in the premises should be regularly checked and repair should be undertaken wherever required.

5.3 Technological Aspects

This section provides production processes existing in the sample TCs selected for assessing the potential environmental aspects. These are focusing on the following industrial sector:

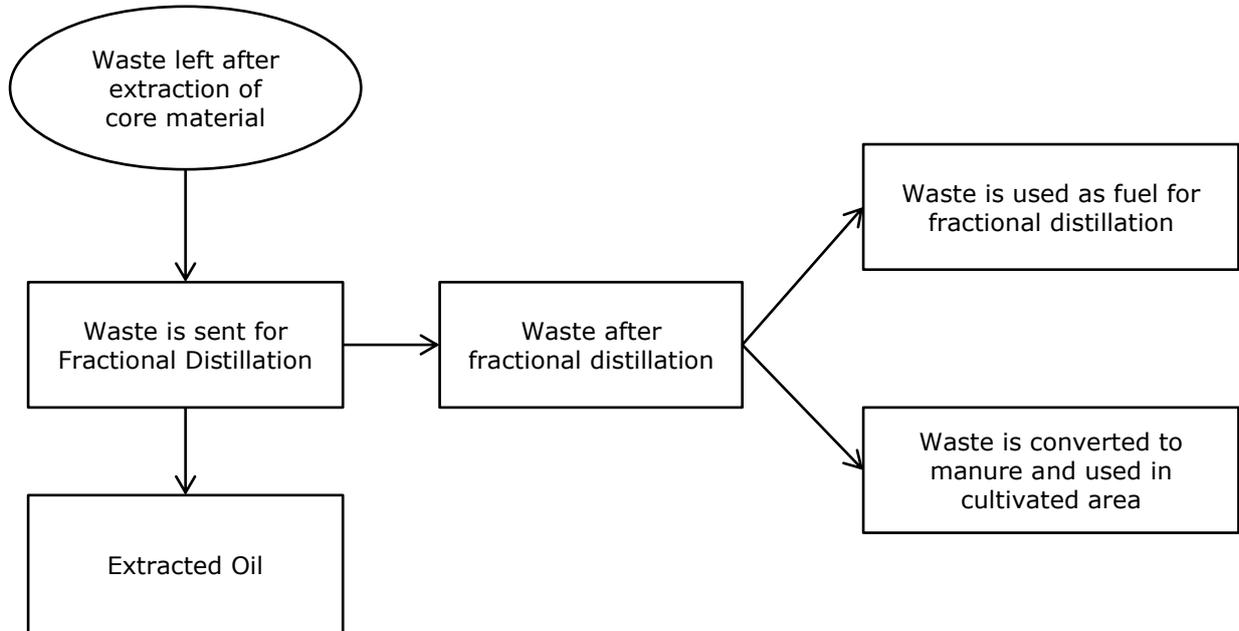
1. Fragrance and Flavours
2. Hand tool manufacturing
3. Footwear manufacturing
4. Specialised tool manufacturing
5. Electrical equipment manufacturing

Since most of the existing TC's are acting as small manufacturing units (in some cases catering to industries with products and in some with the available facilities) apart from imparting knowledge for skill development, the activities performed in all TC's are relevant from an environment management perspective. A brief snapshot of the existing process activities under implementation at these TCs is given below for reference:

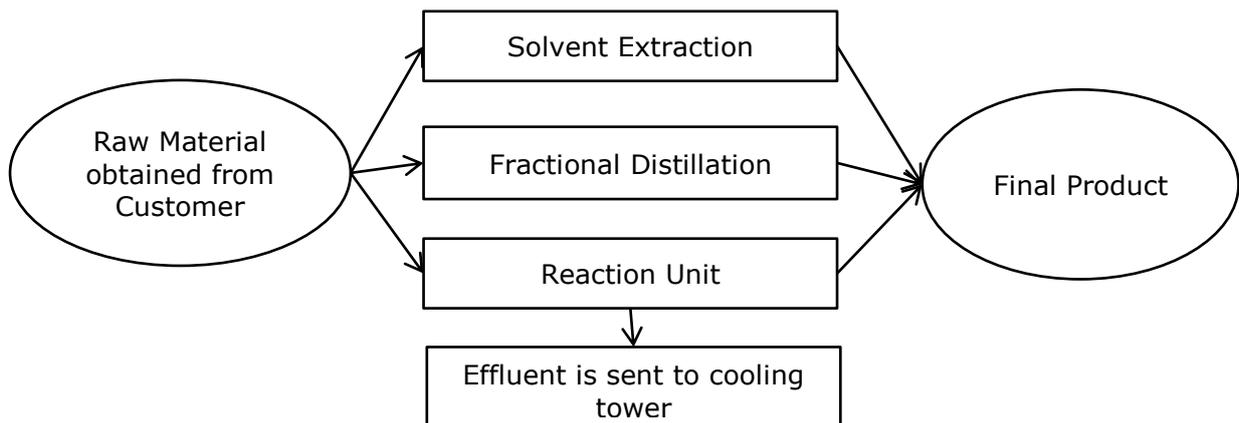
Fragrance and Flavours (F&F)

In F&F tool room production is carried out as Job work (providing facility to small players) and as pilot production for certain customers. The process diagram of the two production processes is provided below:

Job work



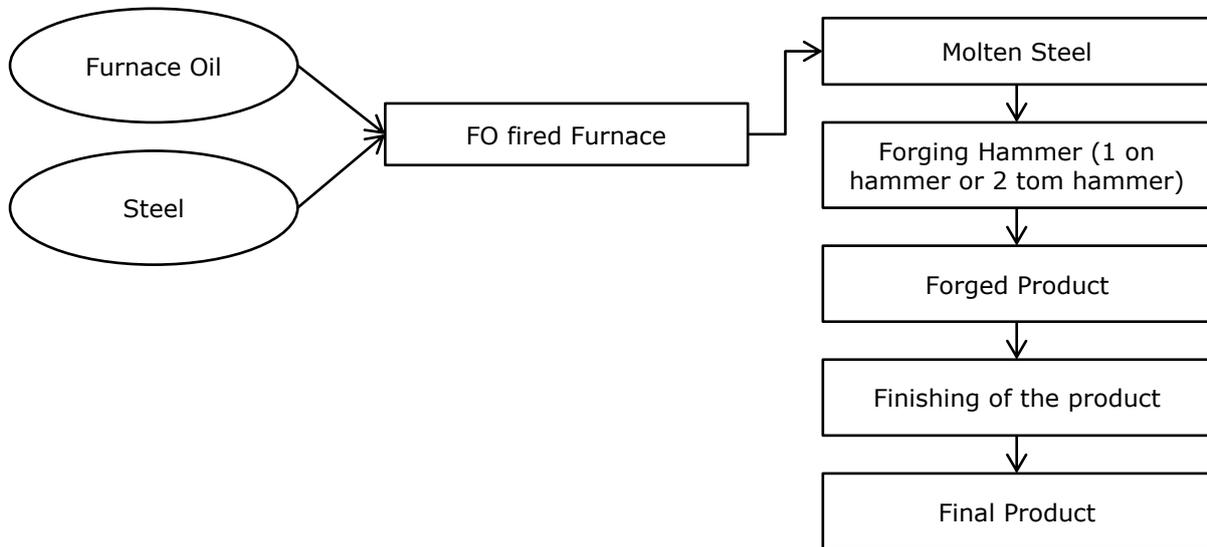
Pilot production



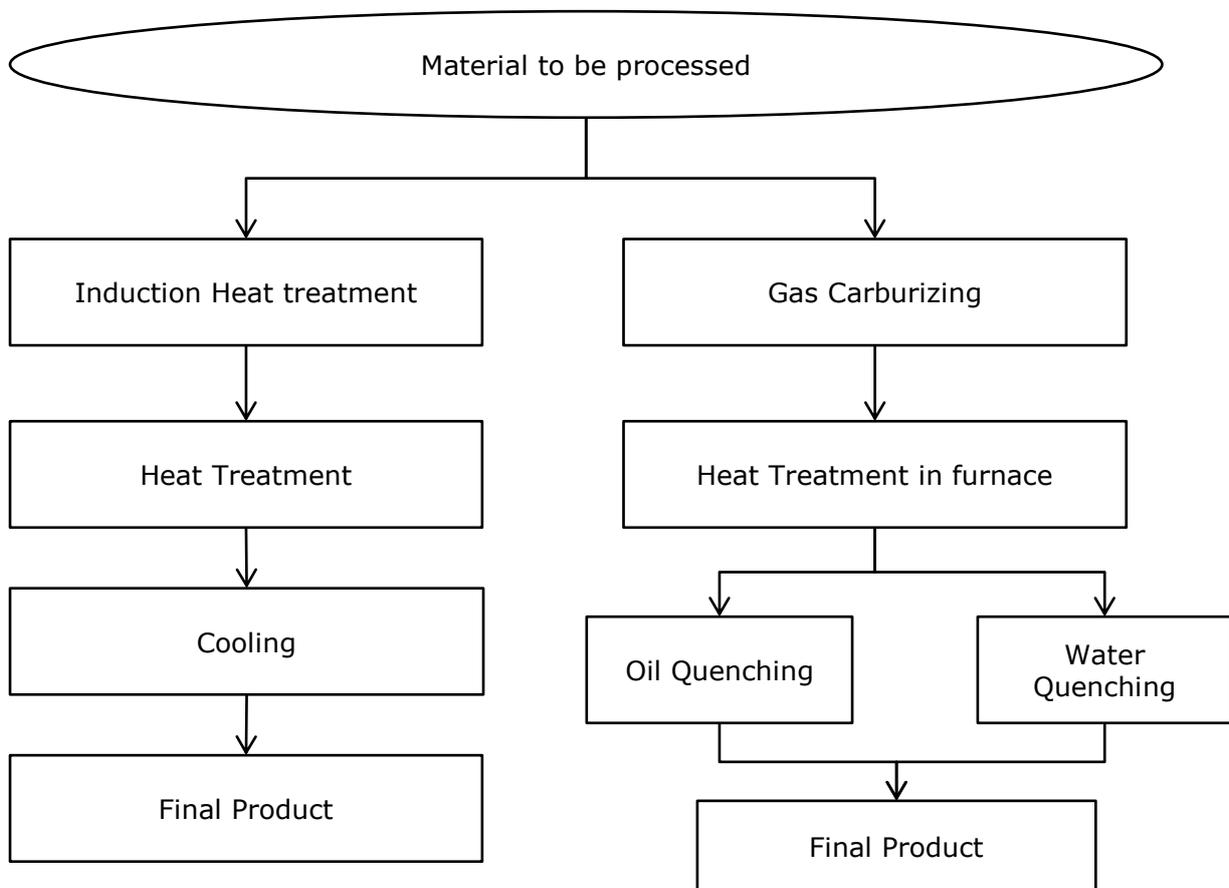
Hand tool manufacturing

There are two manufacturing processes undertaken in the Hand tool room including heat treatment and forging. Apart from this, Jalandhar Tool Room is also providing testing and calibration services. A snapshot of the production processes is provided below:

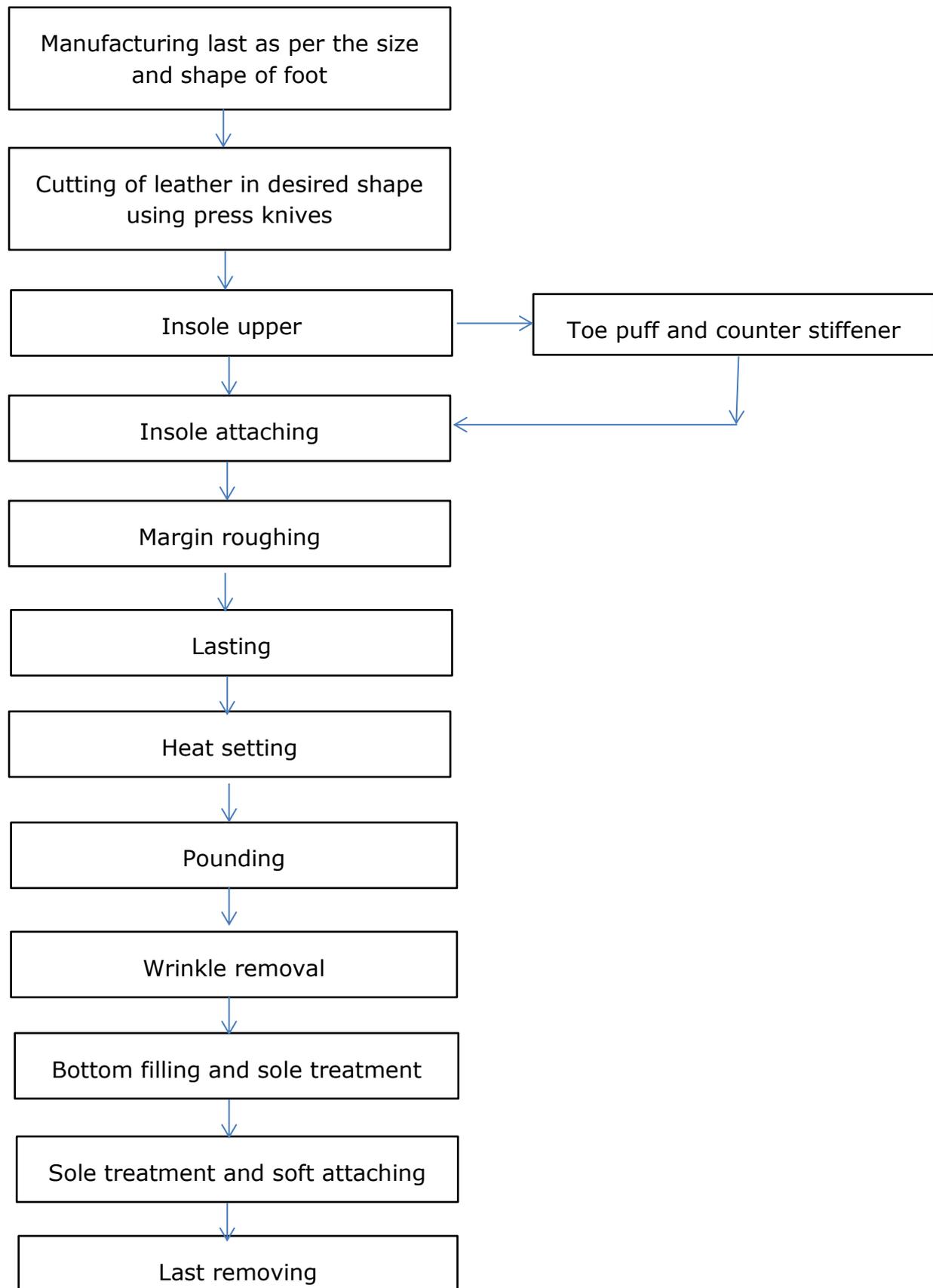
Forging



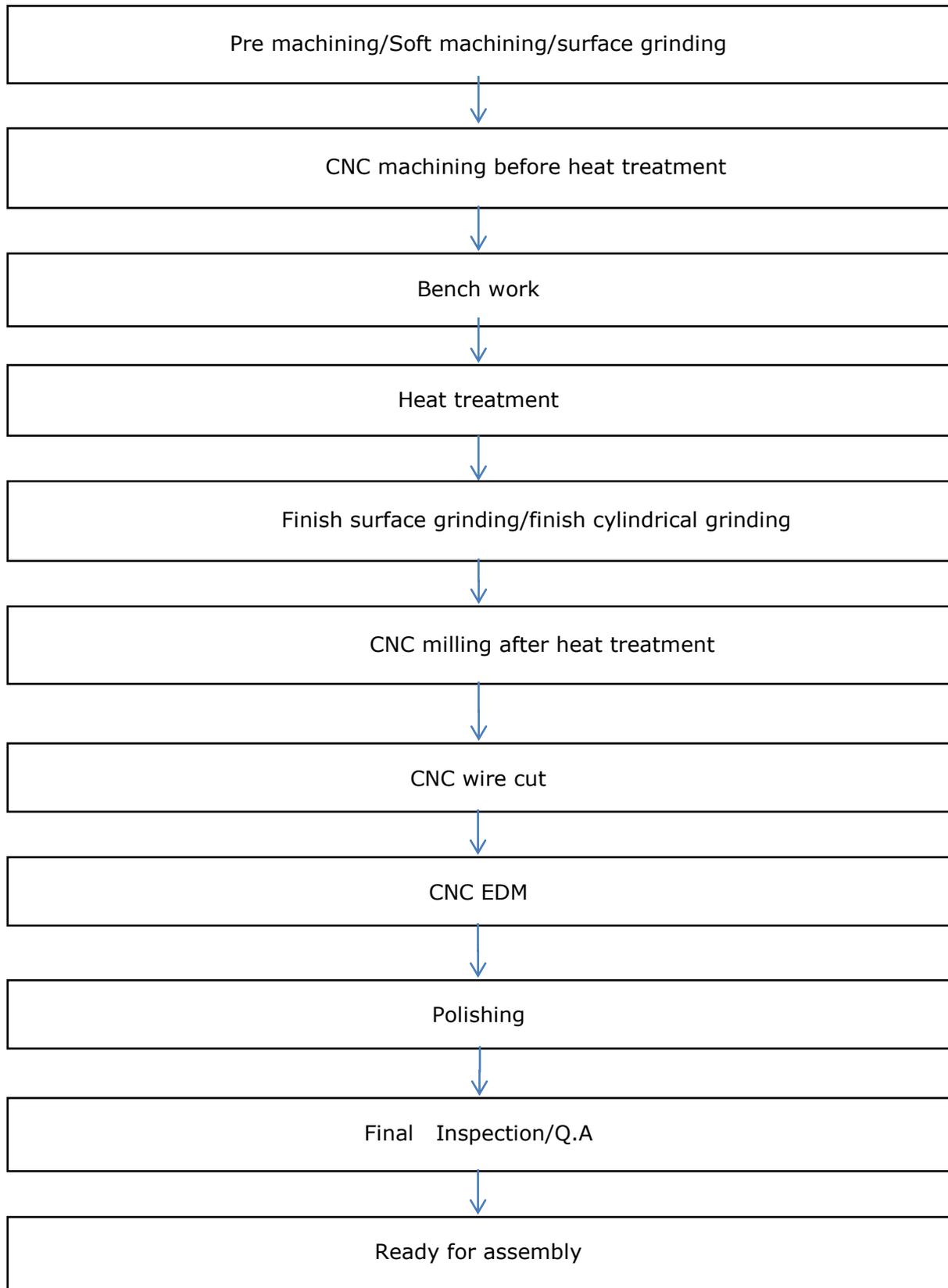
Heat treatment



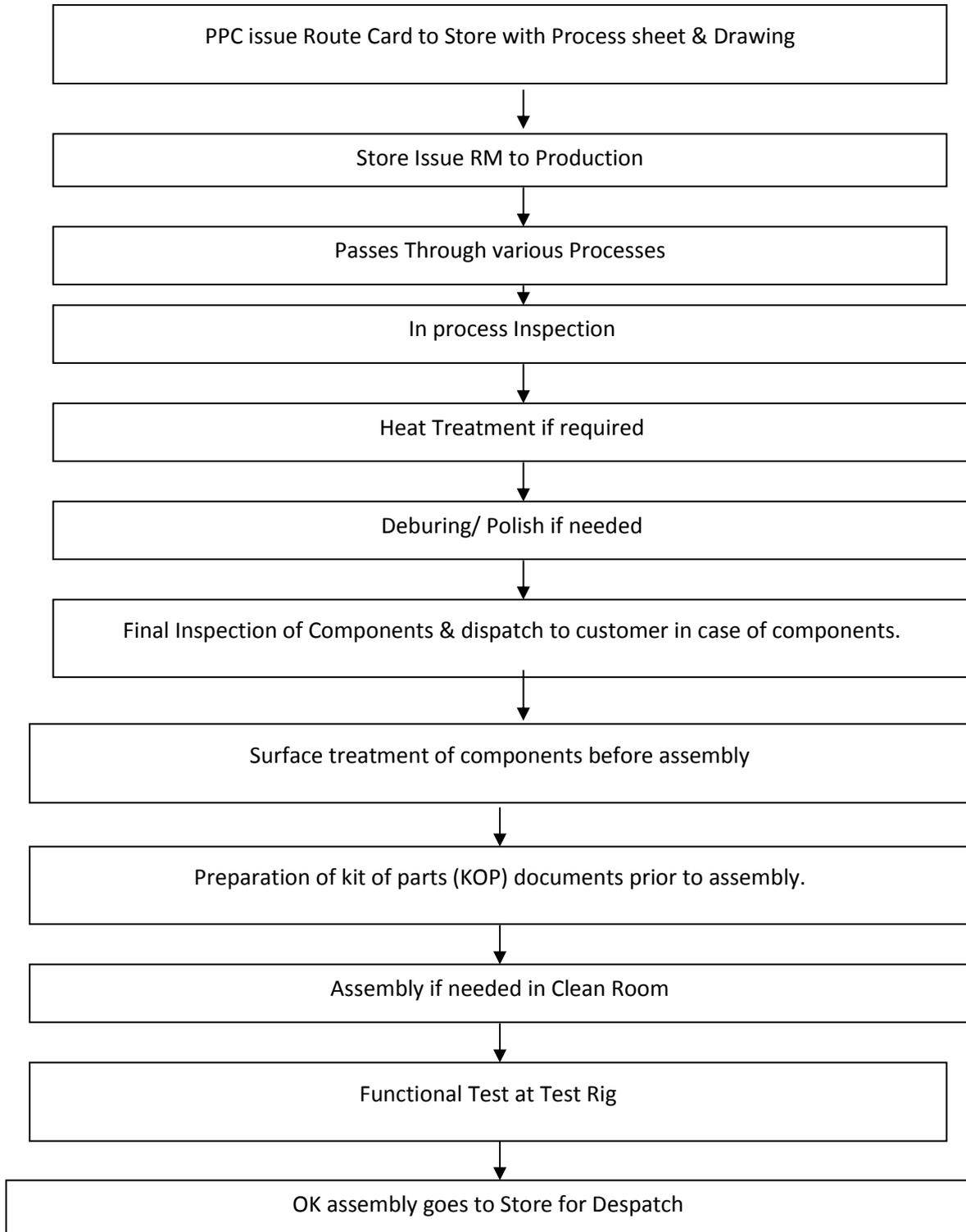
Footwear manufacturing



Specialised tool manufacturing



Electrical equipment manufacturing



There may be a number of EHS related aspects that may arise in the specific context of a Tool Room. These EHS aspects may differ from one TC to another depending upon the industrial sector/trade/technology in question. Snapshot of the potential issues is given in the below section. Aspects may not be limited to the below mentioned points and shall be identified in detail during the specific assessment and risk assessment exercise that would be conducted later during the life cycle of the project following the methodology described in Annexure 3:

Fragrance and Flavours

Activity	Associated Potential Impact/s	Recommendation/s for Mitigation/Management
Cultivation of crops	Eutrophication due to excessive use of pesticides	➤ Organic manure may be used to the maximum extent. Further, pesticide usage should be limited and farmers should be provided training for appropriate amount of pesticide to be used
	Loss of top soil	➤ Farmers should be trained in cultivation practices to avoid instances of loss of top soil
Use of solvents	Safety risk	<ul style="list-style-type: none"> ➤ Solvents should be aggregated and stored in accordance of their chemical properties; ➤ Solvents should be handled with care and appropriate PPE like goggles, apron, etc. should be provided to the person handling the same; ➤ MSDS of the solvent should be displayed in the working area and the storage area; ➤ Eye wash should be provided in the area ; ➤ Fire fighting arrangement should be provided in the working and storage area of the solvent
	Land and water contamination	Solvents should be stored in designated and closed area with concrete flooring;

Activity	Associated Potential Impact/s	Recommendation/s for Mitigation/Management
Use of D.G set (D.G sets shall be used at site to provide electricity in case of power failure)	Air pollution	<ul style="list-style-type: none"> ➤ D.G set to be optimally used with proper orientation and adequate stack height; ➤ Stack monitoring carried out on regular basis; ➤ Proper maintenance of the D.G set carried out on a regular basis
	Noise pollution	<ul style="list-style-type: none"> ➤ Acoustic enclosures are to be provided with the D.G sets to minimize the noise levels
Storage of diesel (Diesel shall be stored on-site so as to ensure availability for D.G sets)	Soil contamination	<ul style="list-style-type: none"> ➤ A covered area shall be defined for storage of HSD with concrete flooring
	Safety risks	<ul style="list-style-type: none"> ➤ Inflammable substance shall not be allowed in the premises

Hand Tool Manufacturing

Activity	Associated impact/s	Recommendation/s for Mitigation/Management
Hammering during forging process	Noise pollution and hear loss over longer period of time	<ul style="list-style-type: none"> ➤ Ear plugs/muffs should be provided to the employees and students working in the hammering process; ➤ Level of noise should be monitored on regular basis so as to ensure that the noise level is within specified limits; ➤ Hammering should not be carried out during night time; ➤ Regular audiometric test of employees should be carried out in order to understand if any person is susceptible to hearing loss and in case such situation is encountered the person should be shifted to other department and provided with medical facility

Activity	Associated impact/s	Recommendation/s for Mitigation/Management
	High vibrations	➤ Monitoring of the vibration shall be conducted on regular basis
Heat treatment	Air pollution	➤ Ventilation should be provided in work shop to avoid concentration of the fumes
	Burn injury	<ul style="list-style-type: none"> ➤ Employees should be provided with Apron while working in the workshop; ➤ Workplace safety training shall be provided on regular basis; ➤ Eye wash and shower facility should be provided in the facility; ➤ Appropriate PPE including, gloves, safety shoes, goggles, etc. should be provided to employees and the students
	Heat stress	➤ Heat stress monitoring of the employees may be conducted once a year to ensure safe and appropriate working conditions
Non-maintenance of clean premises	Injury due to trips	<ul style="list-style-type: none"> ➤ Cleaning schedule may be developed for the site; ➤ Proper demarcation of the storage area for waste material may be done according to the different type of waste material
Handling of waste (Hazardous and non-hazardous waste generated during day to day operations to be carefully handled to ensure environment safeguard)	Land contamination and Water contamination	<ul style="list-style-type: none"> ➤ Waste shall be stored at designated place after segregation on the basis of category (hazardous and non-hazardous); ➤ Hazardous waste shall be disposed of to the authorized vendors only; ➤ A waste management plan shall be chalked out to properly dispose the debris generated from the site.
	Safety risks	➤ Adequate PPE's shall be identified and provided to the workers at site.
Use of D.G set (D.G sets shall be used at site to provide electricity in case of power failure)	Air pollution	<ul style="list-style-type: none"> ➤ D.G set to be optimally used with proper orientation and adequate stack height; ➤ Stack monitoring carried out on regular basis; ➤ Proper maintenance of the D.G set carried out on regular basis

Activity	Associated impact/s	Recommendation/s for Mitigation/Management
	Noise pollution	➤ Acoustic enclosures are to be provided with the D.G sets to minimize the noise levels
Storage of diesel (Diesel shall be stored on-site so as to ensure availability for D.G sets)	Soil contamination	➤ A covered area shall be defined for storage of HSD with concrete flooring
	Safety risks	➤ Inflammable substance shall not be allowed in the premises

Footwear Manufacturing

Activity	Associated impact/s	Recommendation/s for Mitigation/Management
Cutting of leather	Cut injury	➤ Employees and students should be provided with on job safety training
Spraying silicon vapour while shoe sole manufacturing	Air pollution and health hazard	<ul style="list-style-type: none"> ➤ Appropriate ventilation should be provided in the area where shoe sole is manufactured to avoid concentration of silicon vapours; ➤ Appropriate mask should be provided to the operator and people working in the section to avoid health hazard due to silicon vapours; ➤ If possible, alternate to silicon vapour may be identified for the process.
Handling of waste (Hazardous and non-hazardous waste generated during day to day operations to be carefully handled)	Air and water pollution, Land contamination	<ul style="list-style-type: none"> ➤ Waste cuttings of leather should be disposed of to an authorized vendor and should not be burned; ➤ Waste oil generated from the premises should be disposed of to an authorized recycled; ➤ All the waste should be segregated and stored in an identified area; ➤ The storage area of the hazardous waste if any, shall be cemented in order to avoid land contamination;

Activity	Associated impact/s	Recommendation/s for Mitigation/Management
		➤ All the waste shall be stored under a shed so as to avoid contamination and washing away of waste in nearby water stream or ground water in case of rain
Use of D.G sets	Noise pollution	➤ Acoustic enclosures should be provided to avoid noise pollution
	Land contamination	➤ Diesel should be poured in D.G set using funnel; ➤ Concrete flooring should be made near the D.G set
	Air pollution	➤ Chimney with appropriate height should be provided to minimize air pollution and compliance with the legislation
Storage of diesel (Diesel shall be stored on-site so as to ensure availability for D.G sets)	Soil contamination	➤ A covered area shall be defined for storage of HSD with concrete flooring
	Safety risks	➤ Inflammable substance shall not be allowed in the premises

Specialised Tool Manufacturing

Activity	Associated impact/s	Recommendation/s for Mitigation/Management
Designing of components	Depletion of natural resource (paper)	➤ Paper should be recycled for rough work

Activity	Associated impact/s	Recommendation/s for Mitigation/Management
Machining activities	Land contamination due to waste oil and waste coolant	<ul style="list-style-type: none"> ➤ SOP should be formulated for handling and storage of waste oil and coolant; ➤ A designated shall be identified to store these wastes under the shed; ➤ The hazardous waste shall be disposed of to an authorised recycler and shall not be used internally for any purpose until prior permission is sought from SPCB.
	Water contamination due to waste oil and waste coolant	
	Noise pollution due to pressing and shearing activities	<ul style="list-style-type: none"> ➤ Ear muffs / Ear plugs must be provided to officials working on these activities.
	Land contamination due to metal scrap	<ul style="list-style-type: none"> ➤ The metal scrap should be appropriately collected and stored in a designated area before being disposed of/sold to a third party.
	Cut/injury due to metal scrap lying unmanaged	
Use of D.G sets	Noise pollution	<ul style="list-style-type: none"> ➤ Acoustic enclosures should be provided to avoid noise pollution
	Land contamination	<ul style="list-style-type: none"> ➤ Diesel should be poured in D.G set using funnel; ➤ Concrete flooring should be made near the D.G set
	Air pollution	<ul style="list-style-type: none"> ➤ Chimney with appropriate height should be provided to minimize air pollution and compliance with the legislation
Storage of hazardous waste like empty printer cartage, waste coolant, oil soaked cotton waste, etc.	Land and water contamination due to leakage and/or spill over	<ul style="list-style-type: none"> ➤ The storage area of the hazardous waste shall be cemented in order to avoid land contamination ➤ Proper demarcation of the or storage area for hazardous waste shall be done to avoid chances of spill over during handling ➤ All the waste shall be stored under a shed so as to avoid

Activity	Associated impact/s	Recommendation/s for Mitigation/Management
		contamination and washing away of waste in nearby water stream or ground water in case of rain
	Water contamination due to leakage and/or spill over	➤ All the waste shall be stored under a shed so as to avoid contamination and washing away of waste in nearby water stream or ground water in case of rain

Electrical equipment manufacturing

Activity	Associated impact/s	Recommendation/s for Mitigation/Management
Handling of raw material	Cut injury	Gloves should be provided to workers handling the raw material
Machining of raw material	Improper disposal of generated burr	Burr of different material generated during the machining process should be collected separately and disposed of to a vendor
	Eye injury / cut injury	Goggles and/or gloves should be provided to workers; Machining should only be done when the CNC machine cover is closed. No operation should be initiated when protected cover is open
	Land and water contamination	➤ Waste oil generated from the machine should be properly collected and disposed of to an authorised third party; ➤ Waste coolant, if any, from the machines should be collected and disposed of to an authorised vendor. Possibility of using natural materials like vegetable oil should be used.
	Noise pollution	➤ Ear plugs should be provided for noisy operations
Testing of components	Radioactive pollution	➤ Only authorised personal should be allowed to operate the machine;

Activity	Associated impact/s	Recommendation/s for Mitigation/Management
		<ul style="list-style-type: none"> ➤ Proper protective suite should be worn while operating the machine; ➤ In no circumstance the check door should be opened while the machine is operating ➤ Training of all safety aspects while handling
Use of D.G sets	Noise pollution	<ul style="list-style-type: none"> ➤ Acoustic enclosures should be provided to avoid noise pollution
	Land contamination	<ul style="list-style-type: none"> ➤ Diesel should be poured in D.G set using funnel; ➤ Concrete flooring should be made near the D.G set
	Air pollution	<ul style="list-style-type: none"> ➤ Chimney with appropriate height should be provided to minimize air pollution and compliance with the legislation
Storage of hazardous waste like empty printer cartage, waste coolant, oil soaked cotton waste, etc.	Land and water contamination due to leakage and/or spill over	<ul style="list-style-type: none"> ➤ The storage area of the hazardous waste shall be cemented in order to avoid land contamination; ➤ Proper demarcation of the hazardous waste shall be done in the storage area to avoid chances of spill over during handling; ➤ All the waste shall be stored under a shed so as to avoid contamination and washing away of waste in nearby water stream or ground water in case of rain
	Water contamination due to leakage and/or spill over	<ul style="list-style-type: none"> ➤ All the waste shall be stored under a shed so as to avoid contamination and washing away of waste in nearby water stream or ground water in case of rain
Storage and handling of e-waste	Land contamination	<ul style="list-style-type: none"> ➤ Proper collection and storage of e-waste should be done and e-waste should be disposed of to an authorised vendor

Chapter 6 – Environmental Management: Approach and Tools

Environment management should be an integral part of the implementation and operation of a TC. This chapter details out the key requirements that should be adhered to for ensuring appropriate environmental management in each Technology Centre that will be supported through the project. However, specific requirements may vary depending on needs and context of proposed interventions and therefore these guidelines will be treated/used accordingly.

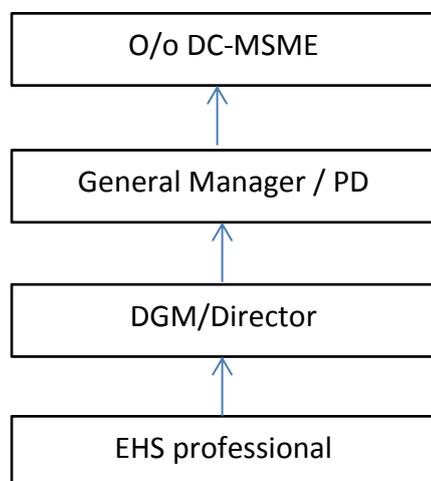
6.1 Key project activities relevant from Environment Management Perspective

Each TC should have the following measures in place so as to ensure good environment, health and safety practices in place thereby minimizing the EHS impact:

1. **EHS Policy:** Each TC should define an EHS policy. This serves as a mission document for the envisaged EHS practices and performance in the future. The policy should be communicated to all the employees, permanent as well as contractual employee, in order to ensure all are on the same page and the culture of minimizing EHS impact runs throughout the organization;
2. **EHS professional:** Each TC should identify/appoint an EHS officer to look after the EHS performance. He should be entrusted with the responsibility of:
 - a) Imparting EHS training to all the employees, students enrolling for courses in the TC and to the third party vendors that are using the facilities of TC to manufacture their products;
 - b) Keep a track of all the applicable legislation and ensure that all the applicable license/approvals required for the operations of TC is in place and the returns required to be submitted under the legislation are submitted in a timely manner with the concerned authority;
 - c) Define Safe Operating Procedures (SOP) so that everyone is clear on the procedures to be adopted while carrying out the day to day operations;
 - d) Conduct internal audit and take plant rounds once in a week to ensure that there is no deviation from the defined procedures.
3. **Conduct/update Environment aspect-impact assessment and hazard-risk assessment of the operations:** An aspect-impact assessment and hazard-risk assessment shall be carried out at the initiation of the operations. This shall be updated every six months or whenever there is an incident in the TC. A procedure on how to conduct an Aspect-Impact assessment and Hazard-risk assessment is described in Annexure 4.
4. During operations of TCs, it is essential to ensure that the EMF is implemented properly. This shall be the **responsibility of the core team** formed at each TC that has a mandate of regularly monitoring environment performance and take corrective action if deviation is found.

5. The ideal structure for roles and responsibilities across the TC is as follows:

Activity	Official/department	Responsibility
Coordinating, facilitating and monitoring EMF implementation	O/o DC-MSME	<ul style="list-style-type: none"> ➤ Report to world bank for overall implementation of the EMF and applicable legislation ➤ Coordination with all the TCs; ➤ Ensure timely budget for the implementation of the EMF ➤ Quarterly review of the EMF implementation
Monitoring and ensuring EMF implementation	PD/GM of the TC	<ul style="list-style-type: none"> ➤ Monthly review of EMF implementation ➤ Quarterly reporting ➤ Conducting periodic field inspection to ascertain EHS practices are in place
	DGM/ Director of the TC	<ul style="list-style-type: none"> ➤ Monthly review of EMF implementation ➤ Supervise EMF implementation
Executing the EMF at site	EHS officer / Manager	<ul style="list-style-type: none"> ➤ Prepare monthly reports status report for EMF implementation; ➤ Identifying and updating applicable legislation ➤ Developing and imparting EHS training to employees and students ➤ Conducting regular site inspection to ensure EHS practices are in place



6. Arrange and maintain basic pollution control and safety equipment within TC so as to ensure minimal or no EHS impact due to the operations. These may include but are not limited to the following:
- ✓ Fire hydrant system along with fire extinguishers in appropriate capacity and number. The fire extinguishers shall be placed in accordance with the guidance of fire department or a third party having expertise for it;
 - ✓ Acoustic enclosures for D.G sets used at site;
 - ✓ Appropriate height of the chimney of D.G sets at site. Periodic monitoring shall also be carried out in order to ensure that the concentration of air pollutants in flue gases is within the specified limits;
 - ✓ Appropriate arrangement to treat the water effluent from the industry before discharging the same in municipal drain.
 - ✓ Concrete floor in areas where oil and liquid waste is stored;
 - ✓ Proper shed for storage of waste material.
 - ✓ First-aid kit should be provided in the facility in appropriate number. One box should be provided for every 150 people present in the premises, etc.
 - ✓ Based on the output of A-I assessment and H-R assessment, the impacts and/or risks showing higher severity shall be further analysed and an EMP shall be designed and implemented so as to mitigate the identified impacts.

6.2 Key steps to be followed

6.2.1 Existing TC's

In case of expansion planned for the existing TC's it is essential that a step wise approach may be adopted to minimize its environment impact. A focused approach to identify potential environmental issues shall be adopted at each and every stage of the expansion process from site selection to the stage of operation. This section deals with the expansion at the same site within existing TC. The expansion that involves developing a new site for the TC is covered in the section 6.2.2.

6.2.1.1 Detailed Site Assessment

A detailed site assessment shall be carried out before deciding on the magnitude of expansion to understand the environment feasibility. This may involve gauging the availability of natural resources, raw material, impact on nearby biodiversity due to increased capacity, legislation requirement, etc. A checklist that was used to carry out the assessment is provided in Annexure 2.

6.2.1.2 Campus Layout/plan

Campus layout is also important for successful performance of a TC. The better and more efficient a design for the internal functions the better the performance.

In the campus at least 30% green area should be maintained and landscaping should be done to improve aesthetics of the surrounding while maintaining habitats conducive to natural fauna. Few initiatives that can be taken up are:

- **Trees:** Effort should be made to plant more trees and their regular upkeep should be done to enhance natural shade within the campus. Cutting of existing trees for expansion should be avoided to the extent possible and 10 trees should be planted for every one tree cut in the process.
- **Heat island effect:** Work may be done at site to mitigate the heat island effect (Thermal gradient difference between developed and undeveloped areas) by following measures:
 - a. At least 40% of the non-roof impervious surfaces on the site (including parking lots and walkways) should be shaded
 - b. Pavements and walkways should be painted in light colour (solar reflectance index > 0.5)
- **Boundary:** The campus should be provided with wall boundary in all the directions to avoid encroachment, theft and safety issues for the employees and students.

6.2.1.3 Detailed building plan preparation

The building design is also crucial to the sustainable performance of the TCs. Initiatives like use of energy efficient products, increasing natural light and ventilation, insulating, etc. may be adopted to enhance positive environment impact of the operations. Also, aspects related to safety like, resistant to earthquakes, proper evacuations, etc., may be planned to ensure successful operations of the TC.

The building design for the expansion should be responsive to the local climate. The buildings that are in hot and dry climatic region should be designed to be passive to heat gains and cardinally oriented so as to reduce the heat gain and direct heat ingress into the building though the walls and openings, a lot of shading elements on the west wall may also be adopted. Similarly, the buildings in a colder climate should be designed to increase the heat gain and also insulate it against heat losses. Emphasis should be given to ensure that development of new building should not block the natural light of the existing infrastructure.

New infrastructure in earthquake prone zones should be designed with proper attention to earthquake safety, safety codes and also escape routes in case of emergency. In case of cyclonic zones it must be taken into account for the roofs and the anchoring of the roofs against the cyclone and rainfall.

Also, efforts should be to use local materials for the construction of the expansion facility to the extent possible. Most of the locations have local sand stone or other stones and these can be easily used for the construction purposes.

Apart from this, certain points that may be adopted during the building plan preparations are:

- Efforts should be made to utilize natural light to the maximum possible extent and provision should be made for natural ventilation;
- Green building codes may be adopted while designing the expansion so as to ensure following environmental safeguards:

- a. Renewable energy in terms of solar water heater, solar panels, solar street light may be used;
 - b. LED/CFL lights should be used within the premises to reduce the energy consumption;
 - c. Water treatment and recycling facility to reduce fresh water consumption;
 - d. Rain water harvesting arrangement so as to recharge the ground water and/or reduce dependency on ground water;
 - e. Proper waste management including practices to minimize waste generation, etc.
- Criteria mentioned in the National Building Code should be followed so as to ensure that all the safety precaution like escape routes/emergency exits, setting of machinery providing appropriate working space, etc. is maintained;
 - Hazardous material like asbestos sheets should not be used in any part of the structure;
 - Substitutes to natural resources should be encouraged in appropriate ratio so as to decrease natural resource consumption while maintaining the required strength (example: Fly ash may be used in small percentage instead of cement for construction, composite material may be used construction of doors instead of wood, etc.);
 - Provision of toilets for both men and women shall be made in appropriate number so as to ensure comfortable and hygienic working conditions;
 - Energy efficient products like 5 star rated Air conditioners, refrigerators, etc should be used in the TC's.

6.2.1.4 Construction management

Construction at the site involves a number of activities. These activities may lead to certain EHS impacts on the existing natural settings and therefore, appropriate mitigation measures are required to be put in place so as to minimize or avoid these EHS impacts. A snapshot of the issues to be kept in mind along with mitigation measures are provided below for ready reference:

S. No.	Likely Issues	Mitigation measures
1	Generation of noise during construction	<ul style="list-style-type: none"> ➤ The construction activities involving generation of noise should be carried out in the daytime only and should be avoided in the night; ➤ Acoustic barriers may be used in case residential area is in the immediate vicinity or classes are disturbed in the existing facility
2	Loss of top soil	<ul style="list-style-type: none"> ➤ Top soil excavated from the site should be carefully handled. It should be collected separately and stored as a heap which is appropriately covered. The heap should not be put in the direction of wind to avoid dust generation; ➤ Maximum effort should be made to utilize the top soil for landscaping within the site;

S. No.	Likely Issues	Mitigation measures
3	Air pollution due to digging and levelling activities	<ul style="list-style-type: none"> ➤ Water sprinkling shall be practiced; ➤ Construction machinery shall be properly maintained to minimize exhaust emissions of CO, SPM and Hydrocarbons; ➤ These activities shall be avoided in very high wind and cover should be provided for loose construction material
4	Water contamination and health risks associated with setting labour camp for construction	<ul style="list-style-type: none"> ➤ Toilet shall be earmarked for both men and women contractual workers; ➤ Adequate drinking facilities shall be provided at the construction site; ➤ Temporary crèche facility may be provided in case of migrant labourers children residing in the camps to ensure safety
5	Air pollution due to movement of vehicles	<ul style="list-style-type: none"> ➤ All the vehicles entering the site to be asked to have updated PUC (Pollution under control) certificate; ➤ Sprinkling of water shall be practiced at the site
6	Land and water contamination due to vehicle movement	<ul style="list-style-type: none"> ➤ Proper maintenance of vehicle shall be ensured out to avoid any leakage of oil or grease.
7	Safety issues due to vehicle movement at the site	<ul style="list-style-type: none"> ➤ Vehicle speed is to be restricted to 15km/hour at site; ➤ Provision of adequate personal protective equipment like safety helmets, face masks, safety shoes, safety goggles etc. for the safety of workers
8	Air pollution due to use of D.G set	<ul style="list-style-type: none"> ➤ D.G set to be optimally used with proper orientation and adequate stack height; ➤ Stack monitoring carried out on regular basis; ➤ Proper maintenance of the DG Set should be carried out on regular basis; ➤ Acoustic enclosures are to be provided with the D.G sets to minimize the noise levels
9	Land and water contamination due to waste generated at site	<ul style="list-style-type: none"> ➤ Waste shall be stored at designated place after segregation on the basis of category (hazardous and non-hazardous); ➤ Hazardous waste shall be disposed of to the authorized vendors only.

S. No.	Likely Issues	Mitigation measures
10	Issues like child labour during construction at site	<ul style="list-style-type: none"> ➤ Provision of clause in contractor's agreement that bans child labour and forced labour at project site. ➤ Adequate procedures to avoid or prevent hiring/entry of child labour at the project site

6.2.1.5 Operation And Maintenance Plan preparation

In case safe operating procedure are already defined for the existing operations, the same may be used in the expanded operations if found appropriate and are not affected by the size of operation. The possible impacts from operations are defined in section 5.2.3. The same shall be assessed and appropriate measures should be adopted to minimize or eliminate the impact.

In case no operating procedures were defined for existing operations, fresh operating procedures may be defined in line with the methodology suggested in section 6.2.2.7 of the report.

6.2.2 Establishment/setting-up of New Technology Centres

6.2.2.1 Screening

Screening is the process by which the appropriate level and type of EA is determined for a given project on the basis of its likely environmental impacts. The two main objectives of environmental and social screening are to:

1. Enhance the environmental and social sustainability of a proposed project. This aspect of screening focuses on the environmental and social *benefits* of a project.
2. Identify and manage environmental and social risks that could be associated with a proposed project. This aspect of screening focuses on the possible environmental and social costs of an intervention and may point to the need for environmental and social review and management.

The screening process aims to quickly identify those projects where no potential environmental and social issues exist, so that only those with potential environmental and social implications will undergo a more detailed screening process. As a consequence, the outcome of the screening process will be a categorization of the project into one or more of the following categories:

Category 1: No further action is needed, either because no significant environmental impacts and risks were identified, or because sufficient environmental review has already been conducted and environmental management recommendations have been incorporated into the project;

Category 2: Environmental sustainability elements need to be integrated into project design because there are possible environmental and social benefits, impacts, and/or risks associated with the project (or a project component) but these are limited in nature, predominantly indirect or very long-term and so extremely difficult or impossible to directly identify and assess.

Category 3: Further environmental and social review and management is needed because potential environmental and social impacts or risks are associated with the project (or a project component) and it is possible to identify these with a reasonable degree of certainty. In some cases, determining the significance of these impacts or risks will require environmental and social assessment which, in turn, will lead to the identification of specific environmental and social management measures that need to be incorporated into the project.

The methodology for screening includes Desk study, site visit and study of available literature.

- ✓ **Desk study** involves collection and review of the secondary data available in the public domain. This may involve the seismic activity of the area where new TC is proposed, soil type, land use pattern, etc. This will enable one to decide the methodology and level of Environment assessment and distributing the responsibility amongst the team members.
- ✓ **Site visit/s** is/are conducted to collect first hand data/information about the new site. This enables a cross check of the secondary data available during the desk review and assessing the likely environmental aspects and health and safety hazards. Also, this involves interaction with different stakeholder in the region to gauge any possibility of conflict related to TC.
- ✓ Also, **publically available literature** review on the issues in the envisaged industrial sectors should be kept in mind. This may further help in a robust screening of the possible EHS impacts of upcoming TC and may provide opportunity to MSME to have measures in place to mitigate the same.

A checklist to conduct screening exercise is enclosed for reference as Annexure 3. The same must be used before finalizing the site for development of new TC.

6.2.2.2 Use of screening results for site selection

Based on the results of the screening exercise decision must be taken on the site selection of the new tool room. In case, the EHS impacts observed from the envisaged TC on the site and its nearby areas is high following actions shall be adopted:

- First preference shall be given to look for an alternative and feasible option to setup the TC;
- In case of non-availability of alternate site location, appropriate measures shall be identified and delineated in the Environment Management Plan for the TC

6.2.2.3 Detailed Site Assessment

A detailed site assessment shall be carried out before deciding on the magnitude of expansion to understand the environment feasibility. This may involve gauging the availability of natural resources, raw material, impact on nearby biodiversity due to the establishment of tool room, legislation requirement, etc. A checklist that may be used to carry out such assessment is provided in Annexure 1.

The output of the detailed site assessment shall provide a holistic view of the existing environment settings and the mitigation/preventive measures required to be adopted so as to minimize the EHS impact of the tool room.

6.2.2.4 Campus Layout/Plan

Campus layout is also important crucial for successful performance of a tool room. The better and more efficient a design for the internal functions the better the performance.

In the campus at least 30% green area should be maintained and landscaping should be done to improve aesthetics of the surrounding while maintaining habitats conducive to natural fauna. Also, efforts should be made to conserved existing vegetation and other rich biodiversity in the premises as well as vicinity.

Apart from this, a number of points shall be kept in mind while planning the campus layout. Some of the key aspects are given below:

- **Trees:** Maximum effort should be made to retain the existing trees in the available area. The campus should be designed in such a way that there is no need of cutting any tree in the area. In case, a tree is cut at the site appropriate approvals shall be taken from the authorities and about 10 trees shall be planted within the campus to compensate the loss. Also, a continuous monitoring should be done to ensure maximum survival rate of the planted trees;
- **Site drainage:** Existing drainage pattern of the available site should be studied and the drainage system required for the TC should be constructed in line with the same. The storm water drain should be constructed separately so as avoid mixing of the fresh and the waste water;
- **Heat island effect:** Site need to be planned properly to mitigate the heat island effect (Thermal gradient difference between developed and undeveloped areas) by following measures:
 - At least 40% of the non-roof impervious surfaces on the site (including parking lots and walkways) should be shaded
 - 50% of parking area can be provided underground
 - Pavements and walkways should be painted in light colour (solar reflectance index > 0.5)
- **Boundary:** The campus should be provided with a wall boundary in all the directions to avoid encroachment, theft and also to provide safety to the employees and students.

6.2.2.5 Detailed building plan preparation

The building design is also crucial to the sustainable performance of the TCs. A number of factors including energy efficiency, materials of construction, natural light and ventilation, insulating, etc. should be kept in mind in order to maintain eco-friendly operations. Also, aspects related to safety like, resistant to earthquakes, proper evacuations, etc., ensure successful operations of the TC.

The building design should be responsive to the local climate. The buildings that are in hot and dry climatic should be designed to be passive to heat gains and cardinally oriented so as to reduce the heat gain and direct heat ingress into the building though the walls and openings, a lot of shading elements on the west wall may also be adopted. Similarly, the buildings in a colder climate should be designed to increase the heat gain

and also insulate it against heat losses. The other buildings that are in earthquake zones should be designed with proper attention to earthquake safety, safety codes and also escape routes in case of emergency. In case of cyclonic zones it must be taken into account for the roofs and the anchoring of the roofs against the cyclone.

Also, efforts should be to use local materials for the construction of the facility to the extent possible. Most of the locations have local sand stone or other stones and these can be easily used for the construction purposes.

Apart from this, certain points that may be adopted during the building plan preparations are:

- Trees should be planted in large numbers to provide natural shade in the open areas. This also helps to reduce the temperature in the campus in comparison to the vicinity;
- Efforts should be made to utilize natural light to the maximum possible extent and provision should be made for natural ventilation;
- Green building codes may be adopted while designing the building layout so as to ensure following environmental safeguards:
 - Renewable energy in terms of solar water heater, solar panels, solar street light may be used;
 - LED/CFL lights should be used within the premises to reduce the energy consumption;
 - Water treatment and recycling facility to reduce water consumption;
 - Water harvesting arrangement so as to recharge the ground water and/or reduce dependency on ground water;
 - Proper waste management including practices to minimize waste generation, etc.
- Criteria mentioned in the National building code should be followed so as to ensure that all the safety precaution like escape routes/emergency exits, setting of machinery providing appropriate working space, etc. is maintained;
- Hazardous material like asbestos sheets should not be used in any part of the structure;
- Substitutes to natural resources should be encouraged in appropriate ratio so as to decrease natural resource consumption while maintaining the required strength (example: Fly ash may be used in small percentage instead of cement for construction, composite material may be used construction of doors instead of wood, etc.);
- Provision of toilets for both men and women shall be made in appropriate number so as to ensure comfortable and hygienic working conditions;
- Energy efficient products like 5 star rated air conditioner; refrigerator, energy efficient motors, etc. should be used in the TC's.

6.2.2.6 Construction Management

Construction at the site involves a number of activities. These activities may lead to certain EHS impacts on the existing natural settings and therefore, appropriate mitigation measures are required to be put in place so as to minimize or avoid these EHS impacts. A snapshot of the issues with the basic principles that should be kept in mind during the construction activity is as follows:

S.No	Likely Issues	Mitigation measures
1	Generation of noise during construction	<ul style="list-style-type: none"> ➤ The construction activities involving generation of noise should be carried out in the daytime only and should be avoided in the night; ➤ Acoustic barriers may be used in case residential area is in the immediate vicinity
2	Loss of top soil	<ul style="list-style-type: none"> ➤ Top soil excavated from the site should be carefully handled. It should be collected separately and stored as a heap which is appropriately covered. The heap should not be put in the direction of wind to avoid dust generation; ➤ Maximum effort should be made to utilize the top soil for landscaping within the site; ➤ For larger sites, sedimentation basin and contour trenching should be provided so as to avoid loss of top soil
3	Air pollution due to digging and levelling activities	<ul style="list-style-type: none"> ➤ Water sprinkling shall be practiced; ➤ Construction machinery shall be properly maintained to minimize exhaust emissions of CO, SPM and Hydrocarbons; ➤ These activities shall be avoided in very high wind and cover should be provided for loose construction material
4	Water contamination and health risks associated with setting labour camp for construction	<ul style="list-style-type: none"> ➤ Provision of separate mobile toilet facilities for men and women shall be made; ➤ The domestic effluent shall be properly disposed of in soak pits; ➤ Garbage bins shall be provided to all workers' accommodation for dumping wastes regularly in a hygienic manner; ➤ Awareness programmes to be conducted regularly for workers on AIDS, and other health related issues; ➤ Adequate drinking facilities shall be provided at the construction site; ➤ Temporary crèche facility may be provided in case of migrant labourers children residing in the camps to ensure safety

S.No	Likely Issues	Mitigation measures
5	Air pollution due to movement of vehicles	<ul style="list-style-type: none"> ➤ All the vehicles entering the site to be asked to have updated PUC (Pollution Under Control) certificate; ➤ Maintenance of vehicles shall be carried out regularly ➤ Sprinkling of water shall be practiced at the site
6	Land and water contamination due to vehicle movement	<ul style="list-style-type: none"> ➤ Proper maintenance of vehicle shall be carried out to avoid any leakage of oil or grease.
7	Safety issues due to vehicle movement at the site	<ul style="list-style-type: none"> ➤ Vehicle speed is to be restricted to 15km/hour at site; ➤ Necessary safety trainings shall be provided to the drivers of construction vehicles for speed restrictions and do's and don'ts to be followed during movement of construction vehicles; ➤ Provision of adequate personal protective equipment like safety helmets, face masks, safety shoes, safety goggles etc. for the safety of workers
8	Air pollution due to use of D.G set	<ul style="list-style-type: none"> ➤ D.G set to be optimally used with proper orientation and adequate stack height; ➤ Stack monitoring carried out on regular basis; ➤ Proper maintenance of the D.G set should be carried out on regular basis; ➤ Acoustic enclosures are to be provided with the D.G sets to minimize the noise levels
9	Land and water contamination and safety risks due to use and storage of diesel at site	<ul style="list-style-type: none"> ➤ A covered area shall be defined for storage of HSD with concrete flooring; ➤ The diesel storage area shall not be proximity of the labour camps; ➤ Inflammable substance shall not be allowed at the project site.
10	Land and water contamination due to waste generated at site	<ul style="list-style-type: none"> ➤ Waste shall be stored at designated place after segregation on the basis of category (hazardous and non-hazardous); ➤ Hazardous waste shall be disposed of to the authorized vendors only; ➤ A waste management plan shall be chalked out to properly dispose the debris generated from the site.
11	Issues like child labour during construction at site	<ul style="list-style-type: none"> ➤ Provision of clause in contractor's agreement that bans child labour and forced labour at project site. ➤ Adequate procedures to avoid or prevent hiring/entry of child labour at the project site

6.2.2.7 Operation and Maintenance Plan preparation

The success of the expansion activities and new developments may be attributed to vigorous and continuous monitoring of all the activities including environment and social management. The monitoring of environment parameters must be undertaken on monthly basis and a copy of the consolidated performance should be sent to MSME for their records and recommendations. Annexure 5 provides a monitoring and reporting template that can be adopted by the T.C's

For environmental and social components of a project, environmental and social monitoring plan is developed, based on baseline data and impacts predicted during the environmental and social assessment process.

Operation and maintenance in the tool rooms may have a number of EHS impacts based on the type of industries. The possible aspects are delineated in the section 5.3 of the report.

Chapter 7 – Stakeholder Consultation

7.1 Definition of Stakeholder

Stakeholder can be defined as individual, group, organization, member or system that affects or can be affected by an organization's actions

7.2 Identification and Categorization of Stakeholders

Government of India and State Governments are main stakeholders in the project. Government of India will be responsible for implementation and operating these centres by constituting a Governing Council Body or other appropriate mechanism within the framework of Government of India rules. State Government will provide land and ensure that these centres get electricity, water and other services in a timely manner.

The other stakeholders will be Regional / Sectoral Industry Associations representing MSMEs, trainees, Regional / National level Academic / Vocational Training Institutions and beneficiary MSMEs availing services of these centers especially from Auto, Plastic, Electronic, Aerospace, Consumer durables and other general engineering sectors.

7.3 Approach / tools for Stakeholder Consultation

Formal and informal consultation exercises are to be undertaken during project preparatory phase as well on a continual assessment with the relevant identified stakeholders on a regular basis throughout the project cycle- conceptualisation, commissioning, and operation.

The stakeholder consultation meetings are to provide clarifications on the design of project proposals as well as mitigation measures. In addition, issues and concerns highlighted by the participants as part of the discussions would be included and addressed in further refining and incorporations into the framework. Upon finalisation of the framework interaction again with all identified relevant stakeholders would ensure that adequate implementation arrangements are made to ensure that environmental safeguards are adopted at every stage and mitigation measures are executed.

7.4 Findings from Consultation Process

During the site visits of the selected 6 tool rooms, prior to drafting the environmental safeguard framework a stakeholder engagement process was followed. The stakeholder category with whom one on one discussions held were during site visits were with the personnel in charge/ Director of the TC and heads of select designated officials representing departments such as administration, electrical, EHS, etc. and also beneficiaries of the TC namely students .

These interactions brought in insights on the current safe guard systems being followed in each of the TC with respect to environment, health and safety aspects. The proceedings of the national level consultation workshop are attached in Annexure 5.

Chapter 8 – Implementation Arrangements

The National Program will be governed by a Program Steering Committee (PSC) chaired by the Secretary of the MSME Ministry and comprising representatives of the main stakeholders including from: Ministry of Science and Technology, Ministry of Communication and Information Technology, Ministry of Heavy Industry, Ministry of Labor (DGE&T), State Governments through their Principal Secretaries/Secretaries of Industry, the NSDA, Academia and Research Institutes as well as the relevant leading industry associations. This Program Steering Committee is expected to play an important role also during Program preparation.

The program implementation responsibility will lie with the Development Commissioner of the MSME Ministry. The Development Commissioner (DC, MSME) will designate a Program Coordinator (PC) assisted by a small dedicated team which will act as the interface between the Development Commissioner (MSME) and the Implementation Partner (IP). The IP was procured competitively through international bidding, and will together with the PC and his core team form the Program Implementation Unit (PIU), will carry out the day-to-day management of the entire program.

The IP is expected to rapidly boost the capacity and expertise of the MSME PC and his core team in all key implementation aspects. These will include but not be limited to; World Bank procurement, financial management, environment, social, health and safety safeguards specialists, and deploy other subject expertise as and when needed.

A Program Advisory Committee (PAC) will be set up, which will comprise thought leaders from Industry, academia and industry associations to provide strategic inputs on strengthening the Indian MSME ecosystem through this Program. This Committee will work closely with the National Program Director / Chairman, Implementation Committee through the design and execution phases of the Program and ensure continuity. MSME Chief Vigilance Officer and Public Information Officer will sit on the PAC to strengthen program governance aspects.

Industry-specific Joint Working Groups (JWGs) will also be constituted to provide domain expertise and advisory inputs to help ensure that the Program is as relevant and impactful to the specific industry stakeholders as possible. The JWGs will consist of domain specific industry leaders, representatives from the relevant business associations, government institutions and academia.

Each TC is/will be an autonomous Society as per the Societies Registration act 1860, each governed by a Governing Council (GC) representing key stakeholders, in particular from the relevant parts of the private sector (e.g. providers of services being offered by the TCs and local business associations). The Program will be the opportunity to test different governance models for the TCs, including SPVs with Board of Directors. At least one TC will pilot the SPV (Special Purpose Vehicle) model under the Program. As responsibility centers under MSME performance management system, TCs will draft subsidiary Results Framework Documents (RFDs) stating their objectives, performance benchmarks and planned actions in alignment with MSME RFD. TCs will be certified ISO 9001.

Each TC and its Community of Practice (CoP) will be linked to one or more Cluster Network Managers (CNM) in key industry clusters associated with that TC. The CNM will ensure that each TC is peered with other TCs, and all key actors relevant to the thematic

area, nationally and internationally including experts/advisors. CNM ensures that it keeps abreast with the needs of the business and student communities and that it contributes to/benefit from the eco-system.

Also, the TC and its CoP will be supported by world renowned, internationally recruited Technology Partners (TPs), who will ensure the TC and its CoP is well informed of the latest technology developments, future trends, specialized equipment which need procuring and common infrastructure required for a given domain, at a given TC.

In addition, to ensure that the TC also stimulates real time knowledge sharing, virtual learning and simulation, it needs to become the hub of communication and innovation for its CoP. To this end, an IT service Provider (ITP) will be procured through international bidding who will essentially provide comprehensive fee based web based (portal) IT services supporting TCs and their clients.

The 15 new TC will be designed and built in using environmentally friendly code of practice and procured through NBCC/CPWD. The scope of the civil works may also include some existing TCs which need refurbishment.

The technical assistance in component 3 (other TA) supports safer and better work environments in TC and SMEs they support as well as better environmental and social practices through awareness campaigns, counseling services etc. This will also support entrepreneur development activities such as incubation services for MSME startups.

Annexures

Annexure 1

Checklist for Assessment of Existing Tool Rooms

Section I: General

1. Name of the Tool Room	
o Location	
o Block	
o District	
o State	
2. Rural/Urban/Semi-urban	
3. Date of site visit (dd/mm/yyyy)	
4. Details about key person/s with whom interactions took place during site visit	
o Name	
o Designation	
o E-mail id	
o Telephone Number	
o Mobile No.	

Section II – Physical Infrastructure Aspects (Land and Buildings Related)

1. Total Campus Area (in hac.)	
2. Number of Buildings in the Campus	
3. Total Built-up Area (in sq. mt.)	
4. Ownership of land	Lease/Government/Any Other
5. Name of the department/agency in whose name the land is registered.	Provide name as it reflects in revenue record.
6. Land area as shown in revenue records	Mention area as it reflects in the revenue record.

7. Is the total area properly demarcated/protected by a boundary?			
8. Environmental Setting			
○ Topography of the site			
○ Seismic Zone			
○ Rainfall (average - in mm)			
○ Temperature (max.) (in °C)			
○ Temperature (min.) (in °C)			
9. Land-use Zone within the Tool Room is located	Industrial/Special Economic Zone/ Commercial/Residential/Any Other		
10. Land-use surrounding the Campus	Industrial/Special Economic Zone/ Commercial/Residential/Any Other		
11. Is there any court case/legal dispute related to land on-going?			
12. Is the existing Tool Center within 1 km from the following?			
○ National Park	Yes	No	If yes, provide name and distance details.
○ Wildlife/Bird Sanctuary	Yes	No	If yes, provide name and distance details.
○ Protected/Reserved Forest	Yes	No	If yes, provide name and distance details.
○ Wetland/Lake	Yes	No	If yes, provide name and distance details.
○ Any other environmentally sensitive area?	Yes	No	If yes, provide name and distance details.
13. Is the Tool Room located in a critically/notified polluted area?	Yes	No	If yes, name the area.

14. **Record observations on the following:**

Ventilation in the building	Over-all	
	Hostel	
	Canteen/mess	
	Toilets	
	Rooms	
	Workshop	
	Any specific observation	
Any visible structural distress/defect in the building		
Storm water drainage		
Is there any water logging in the campus during the rainy season? If yes, how long does it last and what is the reason.		
Parking		
Signage inside/outside the building		
Storage of materials		
Cleanliness and hygiene of the over-all campus		
Arrangements for the Physically Challenged		
Availability of open space/s in the campus		
Green area/ belt		
What kind of manure/chemical is used for maintaining green areas?		

15. Sanitation Arrangements

Number of toilets - gents	
Number of toilets - ladies	
Over-all cleanliness	
Cleaning and maintenance arrangements	

16. Solid Waste Management

(including wastes from canteen, office, canteen/mess, workshop and e-waste)

Waste/s generated (By Type and Quantum)	
Collection / Storage Practices	
Disposal Practices	

17. Waste Water Management

(including wastes from toilets, canteen/mess, hostel, workshop)

Waste/s generated (By Type and Quantum)	
Disposal Practices	
Is any water quality monitoring being done, particularly from wastes arising from production floor/workshops? If yes, provide details.	

18. First Aid and Emergency Response Arrangements

First-aid (availability and quality)	
Emergency Preparedness / Response Plan	
Fire safety arrangements (availability and quality)	
Electrical safety arrangements	
Injury/accident on the workshop/ production floor	
Type of natural disaster/s that the region is prone to	
When and what type of natural disaster struck had last struck the area?	
Mock Drills	

19. Water Usage

Source of water supply	Ground / Piped / Both / Rain water harvesting / Any Other
Is sub-project located in water scare area?	
If yes, then what is the ground water usage status?	
Is there any water body located in and around the campus? If yes, give distance.	
What is the existing water usage per month/annum in the Tool Center?	
Is any water treatment arrangement in place? If yes, give details.	
Is water quality monitoring being done? If yes, provide details.	

20. Environmentally Augmentative Measures

Is there any requirement for artificial lighting during day time? If yes, in which area/s.	
Have measures been taken for energy efficiency in the building. If yes, provide the details.	
Is there any rain water harvesting arrangement?	
Has any other water conservation measure been taken? If yes, provide details	
Has there been any use of environment friendly building materials? If yes, list the materials.	
Is there any current building or block that is compliant with Green Building norm/s?	

Section III - Technological Aspects

(Trade Technology/Machinery/Equipment Related)

Type of Tool Room (Sector)	
Specific Activities that are Undertaken at the Centre	
Over-view about Training Course/s Offered	
Duration of Training Course/s Offered	
Number of persons trained so far (by course)	
Type of Technology in use at the Center	
Remarks	Any Other Important Points (Affiliations/Certification/Production Facility and its use)

Keeping in mind the nature of the trade, assess the following aspects and add other questions as required:

1. Resource/Raw Material use/Productivity

- What kind of raw materials are used?
- Provide production related details.
- Is any specific technology being used that helps in resource conservation? If yes, provide details.

2. Water Usage

- Quantum of water used
- Source of water
- Have measures been taken for water conservation/efficiency from a technological perspective?

3. Energy Consumption

- Type of energy sources used
- Quantum of energy used
- Is there any renewable energy source in use?
- Are generators in use?
- If yes, of what type?
- Have measures been taken for energy conservation/efficiency from a technological perspective?

4. Pollution Management (air, water, soil, noise)

- Is there any emission/discharge/pollutant generation?
- If yes, of what type? Mention quantum/level by category.
- How is pollution being minimised/managed/mitigated? List specific measures that are being taken.
- Is there any emission/discharge of carcinogenic pollutants?
- Is there any GHG emission?
- What is the disposal mechanism/arrangement?
- Is pollution monitoring being done?
- If yes, what is the system and quality of documentation?
- What is the frequency of monitoring?
- Who manages this?
- Is there any budgetary provision for doing so?
- Is asbestos sheet used in the project site for roofing?

5. Occupational Health and Safety

- What are the specific occupational health and safety hazards associated with the technology in-use at the centre?
- What measures have been taken to avoid/minimise/mitigate these risks?

6. Other Aspects (regulatory compliance, awareness, training etc.)

Annexure 2

Suggested Checklist for Screening

S.No	Issues	Yes/No	Remarks
1	Will the expansion or new tool room affect the land use pattern?		
2	Will the development include significant land disturbance or site clearance?		
3	Will the project involve acquisition of land from private players?		
4	The selected site is defined as industrial / commercial / residential?		
5	Is there any protected area or biodiversity sensitive area in the vicinity which is likely to be affected by the operations of the tool room?		
6	Is there any archaeological or cultural/heritage structure in the vicinity of the site?		
7	Are there any group of indigenous people in and around the selected site?		
8	Will the construction activity affect the surrounding around the tool room?		
9	What is the source of water available at the site (Ground water, surface water, municipal supply, etc.)? Is the water requirement envisaged to put additional pressure on the water sources?		
10	Will the project lead to increased air emissions in the region?		
11	Will the project lead to increase in noise levels in the area?		

S.No	Issues	Yes/No	Remarks
12	Will the Tool room involve use of chemicals and/or solvents?		
13	Will the project involve handling, storage and disposal of hazardous waste? If yes, what are the different types of waste envisaged from the TC?		
14	Is the project located in the area of seismic faults? In case yes, in which seismic does the location lie?		
15	Is there any record of natural calamity in the area in the past? If yes, what is the probability of the same effecting the operations of TC in the future?		

Annexure 3

Assessment Guidelines

The assessment for each of existing and new Technology Centres shall be undertaken once the technology related choices have been made. Each activity will be listed down and possible EHS aspects and associated impacts/issues shall be identified. Then, the impact/s shall be rated in the following manner:

Likelihood: It is a measure of likelihood of the occurrence of the activity.

Certain	The activity will occur under normal operating conditions	5
Very likely	The activity is very likely to occur under normal operating condition	4
Likely	The activity is likely to occur at some time under normal operating condition	3
Unlikely	The activity is unlikely to but may occur at some time under normal operating condition	2
Very unlikely	The activity is very unlikely to occur under normal operating conditions but may occur in exceptional circumstances.	1

Consequence: It measures the resultant effect of the impact with reference to legal requirements, natural and socio-economic environmental conditions.

Catastrophic	The impact will be catastrophic and an alternative may be identified and implemented	5
Major	The impact will be major and immediate action should be initiated to mitigate/minimize the impact	4
Moderate	The impact is envisaged to be moderate and immediate action/action in short term should be initiated to mitigate/minimize the impact	3
Negligible	The impacts are insignificant and may be neglected or small mitigation measures may be adopted	2
None	There is no impact envisaged due to the activity	1
Positive impact	There is positive impact of the activity. Scaling and replication of such activity may be evaluated in other TCs	0

Further, the following formulae should be used to calculate the severity of an impact

Severity = Consequence X Likelihood

Annexure 4
Key Reporting and Monitoring Parameters

(To be refined and developed specifically for each Technology Centre)

S.No	Parameter	Frequency
1	Water consumption	Monthly
2	Water Cess Report	Monthly
3	Energy consumption	Monthly
4	Waste generation and disposal - Municipal Solid Waste - Hazardous waste - Non-hazardous waste - Other categories	Monthly
5	Safety records	Monthly
6	Training No of students and other trained	Monthly
7	Air pollution and Noise pollution	6-monthly
8	Internal audit report	Quarterly
9	Updating of legal register	6-monthly

Annexure 5
National Level Consultation - Proceedings
