

APPROACH NOTE

Steel Industry-Academia Interface (SIAI)

2016

APPROACH NOTE

FOR

**Steel Industry-Academia
Interface (SIAI)**



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1.0 BACKGROUND

- 1.1 A one-day workshop on Steel Industry-Academia Interface (SIAI) was organized on April 19, 2016 by RDCIS, SAIL, Ranchi, which was attended by 33 organisations/ institutions representing leading Indian steel makers, Academia and Research Laboratories both from Public and Private Sector.
- 1.2 The workshop was chaired by Mrs. Aruna Sundararajan, Secretary, Ministry of Steel and convened by Shri S. S. Mohanty, Director (Technical), SAIL. Secretary, Ministry of Steel pointed out that Indian Industry and Academia have, for long, been operating in different “silos” of disjointed working without supplementing and complementing one another. Although, in the last few years, there have been sporadic attempts at bringing some synergy through cooperative working and collaborative research programs aided by Steel Development Fund (SDF) or internal MoUs/ MoAs, there has been no structured cooperation owing to a lack of a National-level platform for sustainable interactions. She emphasised the strong and impending need for putting in place a robust Industry-Academia Interface to benefit steel industry and society, at large. In particular, she cited the frequently-drawn comparison between “compartmentalized working” of Boston-based East Coast companies vis-à-vis the “open innovation” approach of Silicon Valley in North America and how it has benefited the Silicon Valley in the long run.
- 1.3 The workshop featured extensive deliberations between the Indian steel industry experts, academicians and scientists, who presented their expectations from the interface and shared their ideas on enhancing synergy, roadmap for future collaborations and

conception of National-level platform. It was for the first time that many experts representing the Steel Industry, Academia and Research Organisations had convened under one roof for a close tripartite interaction.

1.4 Towards the end of the workshop, Secretary, Ministry of Steel directed the gathering to draft an approach note to facilitate the following:

1. To establish a sustainable National level platform for enhanced scientific/ technological cooperation and exchange between Steel Industry, Academia and Research Organisations with support from Ministry of Steel, Government of India.
2. To conceive strategies for evolving
 - National Programs of relevance to steel industry and society, at large.
 - Indigenous disruptive technology development programs through closer involvement of academia, industry, engineering organisations and R&D laboratories for prototype development and upscaling to pilot/ industrial scale.
 - Small projects/ initiatives of specific relevance to industry similar to incumbent Industry-Academia collaborations but in a more structured and institutionalised manner.
 - Initiatives to improve synergy between industry and academia through periodic structured meetings, faculty visits to plants for plant scale exposure, technical talks by industry & academia, attracting M.Tech. and Ph.D. scholars for steel industry through sponsorships &

employment opportunities, student internships/scholarships etc.

1.5 A coordination team comprising following members was constituted to guide the preparation of the draft approach note for SIAI platform:

- Prof. Ranjit K. Ray, IEST, Shibpur
- Prof. N. B. Ballal, IIT Bombay
- Prof. P. K. Ghosh, IIT Roorkee
- Prof. T. A. Abinandanan, IISc Bangalore
- Dr. S. Tarafder, CSIR-NML, Jamshedpur
- Dr. T. Venugopalan, Tata Steel, Jamshedpur
- Dr. Marutiram Kaza, JSW Ltd., Bellary
- Mr. Deepak Gupta, Essar Steel, Hazira
- Dr. S. Chatterjee, MECON Ltd, Ranchi
- Dr. B. K. Jha / Dr. Ramen Datta, RDCIS, SAIL, Ranchi (Convenor)

2.0 OVERVIEW OF STEEL INDUSTRY

- 2.1 Iron and steel continue to be vitally important to society. Steels are by far the most widely-used metallic materials even in today's context. The complexities that have made ferrous alloys such versatile materials also have made them a fruitful area for research and development.
- 2.2 Worldwide, the production continues to increase along with economic growth, with more than 1600 million tonnes of crude steel being produced in 2015 and over 215 kilograms of steel per capita consumption. India's National Steel Policy envisages that the total steel production of the country will reach 300 MT by 2025. Thus, there exists a huge opportunity for the steel industry to grow both in terms of quantity and quality to meet emerging needs of the country and also, make it self-reliant. With rapidly increasing production volumes, it is also imperative to set technological benchmarks in innovation of new products, process development, conservation of resources and adoption of greener technologies to reduce CO₂ emissions and overall carbon footprint in Indian steel industry.
- 2.3 Steel and its manufacture are confronted with glaring challenges in terms of competing materials, shortage of raw materials & resources and growing safety, environmental & energy concerns. To meet these challenges, there is an impending urgency and growing need to develop steel process technologies indigenously and usher radical innovations in steel products.
- 2.4 Over the years, Indian steel industry has been entirely dependent on manufacturing technologies imported from Western/ foreign countries. There have been no attempts towards development of

steel-related technologies indigenously, principally due to a lack of Industry focus in this area. However, India, with its 60-70 years of rich experience in operating these imported technologies, has become the third largest steel producer in world and is all set to become the second largest producer (about 112 MT) in near future.

- 2.5 With the rapidly changing global steel business environment and keeping in view, the new age obligations of ensuring safe industrial working, resource conservation, energy optimisation and environmental sustainability in terms of CO₂ emission standards, there is a need to develop radically-new, disruptive and path-altering technologies in-house, which are more attuned to country's resources and capacities. This will not only make the country more self-reliant but would also present a lucrative opportunity of marketing these developments outside.
- 2.6 There have been pockets of indigenous technological developments and excellence in the country in the fields of Pharmaceuticals, Space, Defence and Nuclear industries. The Indian Steel sector also needs to adopt a more fundamentally-oriented approach in major technological development programs, on the same lines as country's Pharmaceutical, Space, Defence and Nuclear research programs.
- 2.7 Major technological developments of radical nature can only come about through a institutionalisation of National-level consortium facilitating concerted approach between Steel Industry, Academia, Research Organisations, Engineering Solution Providers and Component Manufacturers through adoption of systematised technological development process involving (a) Identification, (b)

Development, (c) Acquisition and (d) Deployment. Similar interfaces and platforms are already successfully functioning in the world. Notable among them are the German Technology Delivery System, European Steel Technology Platform (E-STEP) and National Science Foundation (NSF), USA. It is also imperative that such platform must be aligned with the country's National objectives pertaining steel production (National Steel Policy), raw material conservation, energy & environmental targets, human resource development etc.

- 2.8 India has a large pool of technical manpower and expertise available in the country owing to its large higher education system in the world. Incidentally, out of all students enrolled in bachelor's degree programs, about one sixth figure in Engineering and Technological disciplines. This can be a major enabling factor for indigenous technological development and self reliance.
- 2.9 There is, thus, a perceived need for a platform or an interface to augment scientific and technological cooperation and exchange between industry and academia to foster development of cutting-edge technologies of National-relevance for assimilation in the steel industry.
- 2.10 To unify the various stake holders under one common umbrella, it is proposed that this National-level platform be guided and supported by Ministry of Steel, Government of India in terms of direction and financial assistance.

3.0 SCOPE OF SIAI

3.1 It is proposed to set up a consortium of Steel Industry, Academia and Research Organisations named **“Steel Industry-Academia Interface (SIAI)”** to promote cross-functional interactions and collaborations for the benefit of steel industry and society. The scope of SIAI shall encompass:

- Establishing a sustainable National level platform for enhanced scientific/ technological cooperation and exchange between Steel Industry, Academia, Research Laboratories & Engineering Organisations with support from Ministry of Steel, Government of India.
- Creating synergy between academia and industry to accelerate pursuance of programs of National importance and development of new disruptive technologies.

4.0 OBJECTIVES OF SIAI

- To evolve an institutionalised mechanism to spearhead R&D programs of National importance in line with country’s national policy, expectations and needs.
- To promote knowledge upgradation and expertise building in both industry and academia through cooperative research.

5.0 STAKEHOLDERS OF SIAI

5.1 The stakeholders of SIAI shall be Steel Industry, Academia, Research Organisations and Ministry of Steel, Government of India.

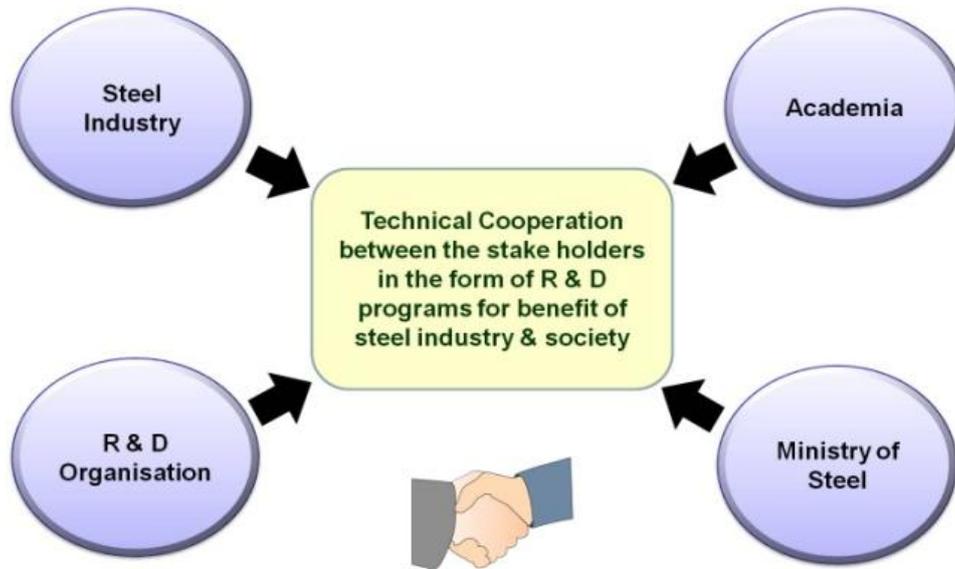


Fig.1: Stakeholders of SIAI

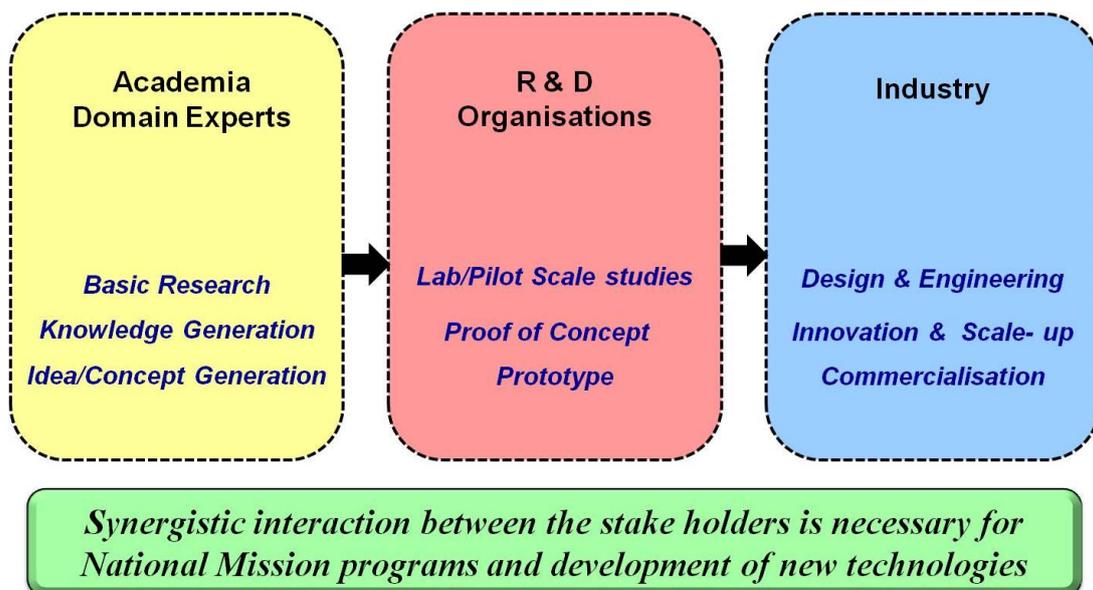


Fig.2: Bridging Academia-Industry Ecosystem

6.0 EXISTING PLATFORMS TO PROMOTE R&D IN STEEL SECTOR

6.1 Ministry of Steel (MoS) has published a roadmap for “Research & Development and Technology for Indian Steel Industry” in 2011 with the aim to sensitize the Indian steel industry to improve its technological capability through R&D and technology intervention. In pursuance to the recommendations of the Parliamentary Standing Committee on Coal & Steel, the MoS has advised all PSU’s and private sector companies to increase their R&D expenditure to at least 1% of turnover by the end of 12th five year plan. In addition to above, the Govt. of India has introduced a number of initiatives for promoting a culture of R&D across the country. Some of these schemes are as follows:

- Steel Development Fund (SDF)/ Government Budgetary Support (GBS)
- Steel Research & Technology Mission of India (SRTMI)
- Centre of Excellence
- Steel Chair Professors & Scholarship Schemes

a) **Steel Development Fund:** This is an initiative taken by Gol to step up R&D activities in the steel sector. A fund of Rs. 150 crores per year has been earmarked exclusively for boosting R&D activities in steel sector and a further Rs. 50 crores has been kept for assistance to small scale industries, environmental and pollution control, market development activities etc. The activities supported by SDF includes development of innovative path breaking technologies for utilization of Indian iron ore and non-coking coal, waste utilistion

and management, development of disruptive processes and products, achieving global benchmarks in productivity, quality etc., development low carbon technology waste gas utilization and innovative projects related to iron & steel. The funding arrangement of SDF projects are as follows :

- Upto 100% funding in case of academic institutes / National Research labs driving the project in partnership with steel industry.
- Upto 50% funding in case of industrial / commercial organization pursuing the projects.
- Upto 50% for pilot / demonstration scale set-ups.

b) **SRTMI**: A society on “Steel Research & Technology Mission of India” has been formed with the approval of Ministry of Steel, Govt. of India. The objective of this Society is to evolve an institutional mechanism to spearhead R&D activities of national importance by revitalizing the existing centres of R&D and augmenting human resource and R&D infrastructure. There are a number of areas in the steel domain which are of national concern and these can only be addressed through focused long term R&D programs. Thus, the major objective of SRTMI is to (a) identify needs of the country and prioritise R&D programs of National importance, (b) assess existing R&D infrastructure including human resources and identify gaps and (c) to evolve a blue print for setting up National Mission Centres for pursuing National R&D programs.

The funding mechanism for SRTMI is as follows:

- MoS provides a seed money of Rs. 100 crores to kick-start the process.
- All participating organizations (industry members of the society) pay an entry fee of Rs. 25 / tonne of crude steel (2013-14) or Rs. 5 crores, whichever is higher.
- All participating organizations pay a yearly contribution to meet the recurring expenses.
- Cost of individual projects will be borne by participating companies / organizations on a case-to-case basis.

The Society will function under the overall guidance of Secretary, Steel.

- c) **Centre of Excellence:** In addition to funding specific R&D projects, MoS has launched a capacity building program to create state-of-art R&D facilities and human resource necessary to conduct research in a specific field and achieve excellence and international recognition. Steel Technology Centres have been created at IIT Kharagpur, IIT Bombay, IIT Madras and IIT BHU to promote “Centres of Excellence” in specific areas of steel research, relevant to the iron and steel industry.
- d) **Steel Chair Professors & Scholarships:** The Chair Professor scheme was started in 2008-09 to address and popularize courses in iron making and steel making among the undergraduate students and also promote M.Tech. and Ph.D. students to choose topics of research relevant to the steel industry. This program is topped by a scholarship scheme for

students to attract bright students in metallurgical engineering to pursue their career in Iron & Steel Sector.

7.0 NEED FOR SIAI

- 7.1 Academia, Industries and R & D organisations have been work in “silos”. There is presently no system to integrate them under one umbrella and a common objective.
- 7.2 R & D programs pursued by different organisations in academia/ industry are not known to one another. There is a need for dissemination through a platform to avoid repetition and promote a culture of “Learning from each others’ experiences”.
- 7.3 Expertise available in our country in the area of steel research is not known. A mapping of expertise needs to be done. No structured mechanism exists today to pool expertise from different “silos” for a program of National Importance.
- 7.4 No platform exists today to pilot development of disruptive technologies from concept to product requiring a multi-organisation and multi disciplinary approach. There is a dire need for incubation centres for “new ideas” and “innovative concepts” which are futuristic in nature.
- 7.5 Development of disruptive and new innovative technologies can be primarily addressed through the “National Mission Programs” steered by SRTMI. Such programs involving basic / fundamental research followed by laboratory scale / pilot scale studies and finally, commercialization through design, engineering and manufacturing necessitates the collaboration and participation of academia, industry, R&D organization and design & engineering organizations. SIAI will facilitate creation of a platform for identification and building of a competent team of experts cutting across institutes and organizations across the country, who will

steer such national mission projects. It will help in complementing the efforts of SDF, SRTMI and other initiatives by building a strong interface between the different stake holders, providing an effective networking between them, strengthening existing ties and bridging new ties and help in development of a evolutionary, collaborative, cooperative, futuristic platform, which will fast track programs and missions of national importance in our country. It will also help in creating a national archive of knowledge-base, expertise and repository of ongoing and completed R&D programs etc. carried out by Academia, Industry and R&D organizations in the last ten years.

- 7.6 SIAI platform will facilitate creation of “School of Ferrous Technology” in line with POSTECH, South Korea to conduct research, provide consultancy and encourage post graduate programs on steel technology. The platform will also serve to forge partnerships with other leading industry-academia consortiums/ platforms in India & abroad, such as European Steel Technology Platform (E-STEP), National Science Foundation (NSF), USA for sharing information and continual improvement.
- 7.7 The platform shall endeavour to develop networking between institutes/ organisations pursuing steel research and create a “Culture of Cooperation” between all stakeholders.

8.0 SCOPE OF WORK FOR SIAI

8.1 SIAI shall play an important role in bringing together the industry and academia together in a structured and sustainable manner, and help them to grow together “organically” under a single ecosystem.

8.2 In this connection, SIAI shall initiate a number of schemes for improving the synergy between the stakeholders and also for improving the knowledge-base and expertise level, both in the industry and academia in the domain of steel research.

8.3 The broad frame work of activities envisaged for SIAI is as follows:

- Identify and recommend programs of National relevance beneficial to the steel industry for funding through SDF, SRTMI etc.
- Encourage “new ideas” and “innovative concepts” and provide necessary support for its funding through SIAI. Incubation and growth of these ideas shall help in creation of futuristic “semi-cooked” technologies.
- SIAI will not facilitate solutions for day-to-day problems faced by the steel industries. Such activities shall be taken up by the steel industry with the academia separately.
- Facilitate creation of web portal for assimilation and dissemination of information related to R&D programs and expertise available in steel sector across academia-industry-R&D organizations.
- Forging a sustainable relationship and networking between academic institutes and industry through various interactive initiatives funded by SIAI.

- Providing opportunity to M.Tech / Ph.D students to work on topic relevant to the steel industry.
- Upgrading the knowledge-base and capability of technical staff working in the steel industry.
- Promoting steel related courses in technical education and academic curricula.

9.0 BROAD AREAS OF INDUSTRY-ACADEMIA COOPERATION UNDER SIAI

9.1 The areas of industry-academia cooperation under SIAI will serve to address exigent issues of steel industry relating to mining, raw materials, beneficiation, agglomeration, extraction, processing, product development, recycling/ waste utilisation, resource conservation and most importantly, steel education without compromising safety, energy and environmental aspects.

9.2 Some areas envisaged for industry-academia cooperative working under SIAI are as follows:

- Break through innovations and technologies leading to reduction in specific consumption of raw materials, particularly coking coal, high grade iron ore and energy.
- Innovation networks and synergistic integration to accelerate acquisition and adaptation of required knowledge for successful development of new technologies.
- Utilisation and beneficiation of mine wastes (slimes), lean/ fine, friable iron ores and suitable agglomeration for iron making
- Beneficiation and increased usage of low grade iron ore
- Development of alternate iron making process routes/ technologies based on use of iron ore fines and non coking coal or an iron making process which does not require coking coal.
- Conversion of non-metallurgical coal into coking variety
- Establish pilot plants and demonstration projects for new technologies.
- Develop new products with improved quality and lower cost for demanding markets.

- Reduction of CO₂ emissions and carbon dioxide capture and sequestration.
- Recycling of steel plant wastes (process dusts and sludges) to reduce/ conserve raw material consumption
- Low carbon technology for iron and steel making
- Clean steel technology for high end products
- Automation systems for improved productivity and product consistency
- Development of steels for strategic/ defence/ ballistic applications (warships, submarines, turbines, armour steels)
- Use of alternate sources of energy
- Enhancing the knowledge level of manpower at industry

9.3 Academia shall augment the value of processes/ products through knowledge. Industry shall supplement and complement by way of manufacturing abilities. Institutionalizing the mechanism of Industry-Academia cooperation shall entail, inter alia, the following bilateral exchanges:

1. Aligning “research at institutes” with “industrial requirements”.
2. Restructuring of academic curriculum to map it with industrial requirements.
3. Dovetailing “Centres of Excellence” at institutes with “industrial requirements”.
4. Creation of appropriate forums such as R & D Operating Committee.
5. Exchange of faculty members with industry personnel and vice versa
6. Pairing of an industrial organisation with academic institute(s) depending on specific research needs.

7. National knowledge network for steel technology
8. Sponsored research

10.0 COMMITTEES UNDER SIAI – ROLES AND RESPONSIBILITIES

10.1 It is proposed to constitute the following committees to steer the functioning of SIAI:

- Apex Committee: For approval & funding of programs and initiatives.
- Standing Committee:
 - For identification, selection, monitoring & implementation of programs and initiatives.
 - Preparation of approach note, requesting for proposals, organising interaction/ meetings etc.
 - Designing and maintaining a web portal for mapping of expertise & flow of information between stakeholders.
- Coordination Team to assist Standing Committee in its activities

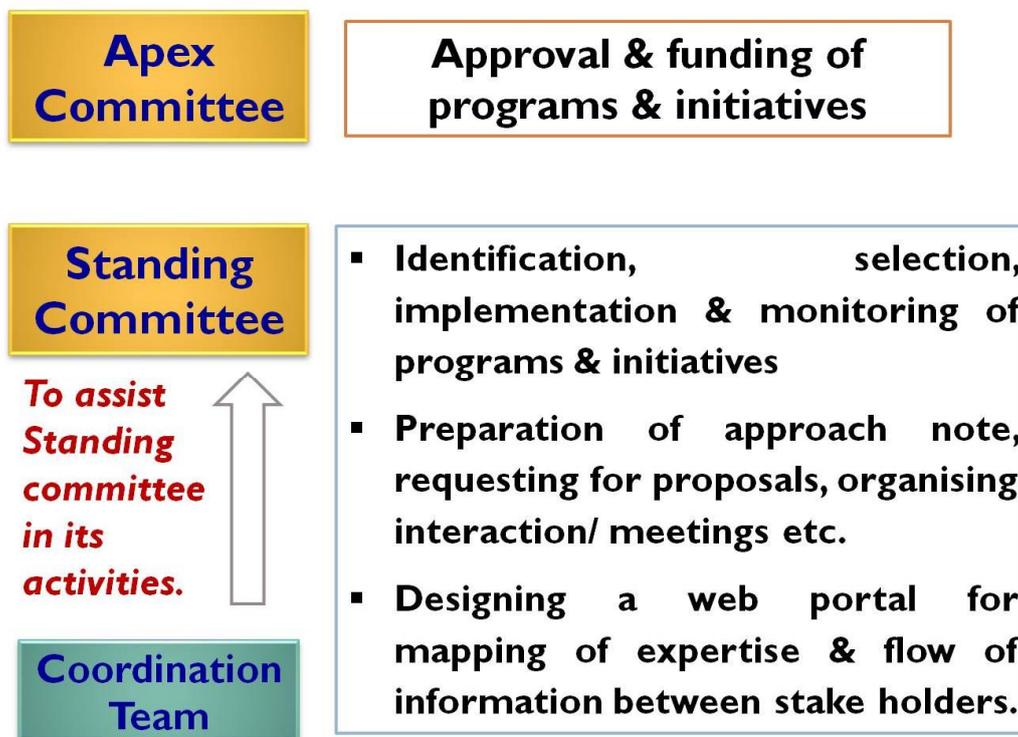


Fig.3: Schematic representation depicting hierarchical structure of SIAI functional committees

10.2 The following is the preliminary listing of SIAI members comprising industry, academia and R&D organisations:

Industries	Academia	R &D Organisation
<ul style="list-style-type: none"> ▪ SAIL ▪ Tata Steel ▪ JSW ▪ RINL ▪ Essar Steel ▪ JSPL ▪ MECON ▪ MIDHANI 	<ul style="list-style-type: none"> • IITs (Kanpur, Madras, Mumbai, Kharagpur, Roorkee, BHU, Patna, Bhubaneswar, Hyderabad) • IISc Bangalore • NITs(Rourkela, Durgapur, Jamshedpur, Suratkal, Warangal, Nagpur) • IEST • BIT Mesra • BIT Sindri • PSG Tech • NIFFT 	<ul style="list-style-type: none"> ○ RDCIS ○ DMRL ○ IMMT ○ NML ○ IGCAR
Membership fees will be decided by Apex Committee		14

Fig.4: Listing of SIAI members

The above listing includes the 33 organisations/ institutions, who participated in SIAI workshop, held on April 19, 2016 at Ranchi. This listing is, as such, not exhaustive and efforts will be made by SIAI to cover more member organisations in time. Member organisations/ institutions of SIAI will be mandated to pay token membership fees, which will be decided by the Apex Committee, after its constitution.

10.3 Apex Committee of SIAI shall be constituted of following honorary members:

- | | |
|--|-------------|
| ▪ Secretary, MoS | Chairperson |
| ▪ CEOs/ Directors of member industries | Members |
| ▪ Directors from IIT, IISc Bangalore, NIT, BIT, IEST, other institutes | 4 Members |

- | | |
|---|-------------------------|
| ▪ Chief Executive, Nodal Agency | Member |
| ▪ Representative, MoS | Convenor |
| ▪ R & D Organisations (Director/ ED) | 2 Members
(Invitees) |
| ▪ Design & Engineering/ Technology
Manufacturers (Directors) | 2 Members
(Invitees) |

10.4 Standing Committee of SIAI shall be constituted of following members:

- | | |
|----------------------------------|----------|
| ▪ Nodal Agency (Chief Executive) | Chairman |
| ▪ Coordination Team | Members |
| ▪ Representative, MoS | |

Coordination Team will function as Standing Committee after submission of Approach Note.

10.4 It is proposed to base the “Nodal Agency” at the office premises of one of the following organisations representing industry:

- RDCIS, SAIL
- Tata Steel
- JSW

The key responsibilities of Nodal Agency shall be as follows:

- Coordinate all activities of SIAI
- Invite Proposals
- Organise meetings of Standing committee/ Apex committee
- Create a national website on Steel R & D
- Recommend proposals to Apex Committee
- Organise funding of initiatives as per guidelines/ framework of SIAI
- Network with different member organisations

10.5 Following support system shall be made available to the “Nodal Agency” for streamlining activities of SIAI:

- Office Space: To be provided by the concerned organisation
- Infrastructure: Furniture, computers, presentation systems, meeting rooms etc. to be arranged by the concerned organisation
- Human Resource: Dedicated team to be provided by the nodal agency. However, office staff, secretarial staff and 1-2 engineers to be hired to manage the office and coordinate day-to-day activities.
- Funding: Suitable funds to be provided to manage the Nodal Office by MoS w.r.t salaries of the hired staff, organising meetings, visits to participating members premises, creation and management of the website etc.

11.0 BROAD PROGRAMS & INITIATIVES TO BE PURSUED

11.1 Following broad programs and initiatives would be pursued by SIAI:

- A. National Programs of relevance to steel industry and society, at large.
- B. Indigenous disruptive technology development programs through involvement of all stake holders for prototyping & up-scaling to pilot/ industrial scale.
- C. School of Ferrous Technology
 - To conduct post graduate programs & research/ consultancy in steel technology.
- D. Small futuristic projects / initiatives involving novel concepts and new ideas initiated through Industry-Academia cooperation.
- E. Initiatives to improve synergy between industry and academia through
 - Periodic structured meetings
 - Faculty visits to plants for plant scale exposure
 - Technical talks by industry & academia
 - Encouraging M.Tech. and Ph.D. scholars through sponsorships & employment opportunities
 - Student internships/ scholarships
 - Upgrade knowledge base of technical manpower in steel industries

11.2 The following criteria shall govern the broad frame work of programs and initiatives envisaged under SIAI:

- Projects/ programs of National importance, relevant to steel industry

- Capital intensive projects
- Need inputs from all stake holders
- May lead to disruptive technology development.
- Address National issues/ International benchmarks

- Innovative programs involving an academic institute and steel plant
 - Need for basic and applied research (M.Tech./ Ph.D. students)
 - Laboratory/ pilot scale trials
 - May lead to development of a semi-cooked process/ product technologies.

- Popularise steel research among M.Tech./ Ph.D. Scholars
 - Topics to be relevant to steel industry.
 - Incentives to students for higher studies in steel research (scholarship/ job opportunity).
 - M.Tech. programs for industry executives through e-learning mode.

- Attract academic faculty in steel research.
 - Provide opportunity to faculty for visits to steel plants to identify areas of collaborative research.
 - Facilitate funds, material and relevant topics of interest.

- Create a web portal for technology assimilation/ dissemination & knowledge sharing
 - Mapping of expertise and flow of information between stakeholders

- Hub of information on projects/ programs funded through Govt. schemes
- Repository to include e-copies of in-house journals, scientific e-magazines, technical articles, newsletters, whitepapers, annual reports without infringing IPR.
- Real time discussion forum / audio-visual conferencing/ Webinars on technological and fundamental developments.

12.0 FUNDING MECHANISM FOR PROGRAMS & INITIATIVES

12.1 The funding mechanism for programs and initiatives conceived under SIAI shall be as follows:

- Large CapEx & New technology development programs
 - SIAI shall play an advisory role. SIAI shall identify, evaluate program proposals & recommend to SDF or SRTMI for funding.
- Specific industry related programs involving an academic institute and steel plant
 - SIAI shall evaluate & fund. Mechanism for funding to be worked out.
- Initiatives to promote Industry – Academia synergy
 - SIAI shall evaluate and fund. Mechanism for funding to be worked out.

12.2 Funds for SIAI shall be provided by SDF/ SRTMI/ Ministry Planned Fund (MPF). The requirement of funds for SIAI shall be as follows:

- | | | |
|--|---|---------------------------------|
| ▪ Programs of National Importance | : | SIAI to play an advisory role * |
| ▪ Programs for Disruptive Technology | : | SIAI to play an advisory role * |
| ▪ School of Ferrous Technology | : | SIAI to play an advisory role * |
| ▪ Programs involving “New Ideas” & “Novel Concepts” | : | Rs. 6 Crore/year |
| ▪ Initiatives to improve Synergy/popularise steel research in academia | : | Rs. 3 Crore/year |
| ▪ Infrastructure, website, manpower etc for nodal agency | : | Rs. 1 Crore/year |

* *Funding by SDF/ SRTMI/ MPF*

13.0 PROCESS FLOW FOR PROGRAMS & INITIATIVES

13.1 The flow chart depicted in Fig. 5 broadly illustrates the process flow for programs and initiatives conceived under SIAI. For program designations A, B, C, D and E, please refer Section 11.1.

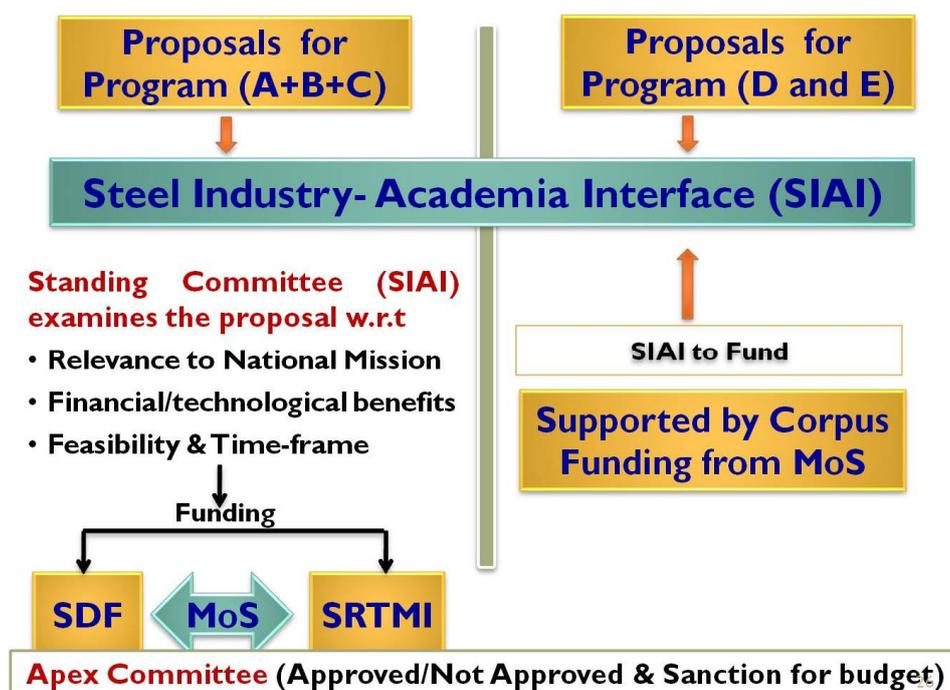


Fig.5: Process flow for Industry-Academia programs & initiatives

13.2 As shown in figure, industry-academia program proposals falling under categories A, B and C would be steered by SIAI with funding support from SDF/ SRTMI/ MPF, while programs and initiatives belonging to D and E categories would be steered and funded by SIAI through Corpus Funding from MoS and membership fees of participant organisations/ institutions.

13.3 For selection & evaluation of program proposals under categories A, B & D, the Standing Committee of SIAI shall enlist the services of an Expert Committee comprising domain experts selected from its database on pool of expertise. If required, SIAI shall enlist the

services of foreign experts in assessment of program proposals, while ensuring development of experts from Indian industry and academia concurrently.

14.0 INTELLECTUAL PROPERTY RIGHT

- 14.1 Any foreground Intellectual Property (IP) under the SIAI program, shall be the joint property of Participating Organizations.
- 14.2 All participating commercial organisations (industry) will have exclusive rights for exploitation of jointly owned foreground IP with no royalty/ fees for a period of six years (from the date of filing of IP).
- 14.3 After six years, commercial participating organisations (industry) will agree to pay defined royalty fees (not exceeding 5% of net profits/ monetary benefits contributed by the developed IP) or a one-time payment (not exceeding 3 times amount of the project cost) to academic/ research institute as a non-exclusive/ exclusive licensing fee.
- 14.4 Participating commercial organisations (industry) will have a first right to receive an exclusive license in respect of the joint foreground IP.
- 14.5 In case participating commercial organisations (industry) do not take exclusive license within six years, academic/ research institute can license the developed IP to third parties. An equitable share of such royalty/ fees would be applicable between participating commercial organisations and academic/ research institutes.
- 14.6 Background IP associated with a project will always vest with owner of IP and in case project needs use of background IP, it will be evaluated by a neutral party of repute and accordingly, owner of IP will be compensated.

- 14.7 All participating organisations along with SIAI will mutually decide if the developed technology/ product/ process can be given to non-participating commercial organisations (Indian/ foreign) or not.
- 14.8 In case a technology developed under SIAI program is licensed out to commercial non-participating commercial organisations, an equitable share of such royalty/ fees would be applicable between participating commercial organisations and academic/ research institutes. The royalty fee charged to third parties will be 3 to 5% more than what is charged to a participating organization.

15.0 TASKS AND TIMELINES

15.1 The following table lists out the preliminary tasks and proposed timelines for functioning of SIAI:

Sl. No.	Task	Time frame
1.	Preparation of approach note by Coordination Team and submission to MoS	June'16
2.	Finalising vision, mission, goals, scope of work of SIAI and preparation of publicity brochure	July'16
3.	Constitution of Standing Committee & Apex Committee through office order from MoS	Aug'16
4.	Preparation of budget for 2016-17 & its approval	Sep'16
5.	Design and development of a web portal for networking between Industry-Academia-R&D Organisations-MoS for cooperative research and development of a national data bank on Steel R&D	Oct'16
6.	Launching of SIAI/ inauguration of SIAI web portal and release of brochure by MoS	Nov'16
7.	Inviting specific proposals from industry/ academia for cooperative research/ other activities.	Nov'16
8.	Formulation of organisation structure and creation of a Nodal Centre for SIAI for day-to-day coordination, organising meetings of Standing Committee & Apex Committee, preliminary assessment of proposals, disbursement of funds, monitoring progress etc.	Dec'16
9.	Obtain initial contribution towards corpus fund from MoS	Jan'17
10.	Examination of proposals received & organising meetings of Standing/ Apex Committees.	Jan-Mar'17