

Occupational health & safety of foundry workers

Many of the industrial accidents can easily be prevented through systematic implementation of an organization level culture of OHS

Micro, Small & Medium Enterprises (MSMEs) in India are the key stakeholders in the country's economic progress in terms of their contribution to GDP, employment generation and even exports. However, there are concerns in the areas of productivity, energy efficiency and more so regarding occupational health, safety and environment degradation.

There is immense scope to build on business case for undertaking business responsibility measures across several MSME sub-sectors.



Manual Material Handling by Foundry workers

handling molten metal (at about 1000°C) into pouring moulds.

The physical work of setting up moulds involving tiresome activities like standing, squatting, sitting alternately.

Because of possible hindrances to work, many of them refrain from using personal protective equipment like protective goggles, helmets, masks, shoes, etc.

Most of the material movement are done manually even though mechanised modern devices are available.

The toilet and rest room facilities are only for namesake and most of them are far from fit and hygienic.

Awareness on safety is significantly low and hence are vulnerable for minor, major or even fatal mishaps.

The total number of foundry workers in India is estimated to be 500,000 directly. The key operations performed by foundry workers are melting metal in a cupola



Toilet conditions

These inputs have helped improve the conditions of at least 1,000 workers across 100 factories. At present, FMC is interacting with 1,000 additional workers among 50 Foundry enterprises located at in Punjab, Rajasthan and West Bengal.

The target of the ongoing project



Lighting condition

(mentioned at S. No. 3) is to make significant sustainable improvements in a total of 200 factories among 2,000 workers.

Previous interventions and outcomes with DST project

Foundation for MSME Clusters (FMC) through its initiative funded by the Department of Science & Technology, the Government of India and GIZ worked towards addressing the challenges faced by foundry enterprises with respect to

energy consumptions and employee working conditions. Intervention in 100 foundry enterprises led to the savings of 4,400 mt of coke with improved working conditions in 50 units.

Scope of interventions

After successful completion of DST project at Haryana, a huge potential to work upon Occupational Health & Safety (OHS) component surfaced, which seeks to address issues of workers' drudgery, worker friendly workplace practices with better provision of workers safety and securities of both physical and



social nature. However, the scope for interventions were very limited under the project, at that time.

EU Switch-Asia Project

In order to further scale up the intervention results, FMC along with its partner namely GIZ, the Global Reporting Initiative (GRI), the Indian Institute of Corporate Affairs (IICA), the Small Industries Development Bank of India (SIDBI) and the United Nations Industrial Development Organisation

contd. on pg 6



Foundry workers are operating without protection equipment



Presence of foundry MSMEs

One of the major MSME sectors in India is the foundry sector. The Indian foundry industry is said to be the second largest next only to USA. It produces nearly 7.44 million metric tons (MT) of castings through 5,500 foundry enterprises existing in nearly 47 clusters spread across the country.

The foundry sector employs nearly 0.65 million persons both directly and indirectly. A study by the Foundation for MSME Clusters (FMC) identified the foundry sector among the less sustainable MSME sectors in terms of energy consumption and working conditions.

Workers' conditions

Some of the common issues faced by foundry workers are as follows:

Most of the foundry workers are low-income, working class members migrated from other states.

Educationally illiterate and physically not so well nourished.

The working condition involves

furnace, mould preparations, mobilizing molten metal in crucibles to the moulds, opening the mould and curing the outputs, sand blasting, grinding and finishing as needed.

FMC interventions

FMC has a long experience of successfully working with foundry enterprises to help improve productivity, energy efficiency and thus carbon emissions. Recently, over the past three years, FMC has also concentrated on improving working conditions of the workers' community in the foundry enterprises through a range of interventions that focus on multipronged strategies comprising (i) creating awareness (ii) building on the consciousness of entrepreneurs (iii) demonstrating short-term & long-term business cases (iv) building & strengthening linkages with local health related institutions (v) linking them up with micro insurance suitable to their requirements (vi) Proposing and supporting development of model units.



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Table 1 - A list of all the completed and ongoing foundry related projects undertaken by FMC

Sl No	Project Title	Client	Duration	Place
1	Promoting Innovative Clusters in India	Department of Science & Technology (Govt of India)	4.5 years	Haryana (Samalkha, Faridabad, Kaithal)
2	Promotion of CSR in MSMEs	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)	1.8 years	Haryana (Samalkha, Faridabad, Kaithal)
3	Scaling up sustainable development of MSME Clusters in India	European Union- Switch Asia	3.5 Years (Ongoing) May 2012- Oct. 2015	Punjab, Rajasthan & West Bengal
4	Strengthening Business Responsibility Support in Foundry Clusters	Small Industry Development Bank of India (SIDBI)	1.2 years	Punjab, Rajasthan & West Bengal

(UNIDO) through a project titled 'Scaling Up Sustainable Development of MSME Clusters in India' funded by the European Union under its Switch-Asia programme was initiated. Under this objective, FMC has decided to intervene in 500 foundry units to make them socially and environmentally responsible, with improved

Occupational Health & Safety (OHS) practices are spread across four foundry clusters in Punjab, West Bengal and Rajasthan. As a built-in component of sustainable foundry development, FMC roped in technical expertise to provide operational technical support and guide units towards an optimum thermal efficiency, thereby saving a huge amount of coke as a fuel.

Environmentally, this translates into more than 60,000 MTs of CO2 emission savings during the project duration and another 36,000 MTs of emission reductions p.a. thereafter. Practically, as a result of this project, the working

conditions of 200 foundry enterprises and 2,000 foundry workers will be improved by adopting Occupational Health & Safety (OHS) measures.

The entire OHS interventions have been classified into three categories viz occupational health, occupational safety and wellbeing of workers.

Awareness creation

The process of activities in the occupational health area will start from awareness creation to provision of preventive techniques to institutionalisation. Awareness creation will lead the workers to appreciate the need for undertaking certain activities such as yogic exercises, daily walking, avoiding of drug abuse etc; in addition to realising the value of life, the culture of being safe and a systematic approach to even encounter emergency situations.

These activities require camps, workshops and meetings. For the purpose

of subsequent institutionalisation, links with local hospitals and insurance systems are essential. On the curative front, undertaking of health camps, eye camps, provision of first aid boxes are envisaged and will be organized.

The conditions, however, vary from unit to unit on the level of awareness, the level of OHS prevalence, the hazards and risk factors and the unit owner's inclination towards OHS. Therefore, it emerges out to be a case to case study and remedy, in addition to a major part of standardised and common set of requirements.

Detailed OHS study

Consequently, a detailed OHS study (of the foundry units in these clusters) is being done and specific clues and list of observations extended to the unit owners, with or without additional explanations as needed.

On the occupational safety part of the activities, issues on layout, equipment additions, technology changes at process levels and creation of infrastructure are some of the aspects that are needed to be built into the programme.

The layout changes, wherever warranted, may lead to a quantum increase in the productivity by way of easy and comfortable work environment and a considerable reduction in wastage, as some of the noticeable short term gains. In the long run, a safe and secured work area sets in, indirectly ensuring OHS. This could also lead to cost reduction for the enterprise owner by way of reduction of labour and/or wastage reduction and/or reduction of rejections.

Provision of equipment will include provision of personal protective equipment, trolleys for movement of

goods and setting of coal charging equipment, etc.

Infrastructure creation

Technology here refers to process changes that include proper charging of material into the furnace that not only reduces the coal consumption but also the ambient temperature for the workers to be able to work comfortably. Infrastructure creation in enterprises may lead to setting up of toilets, eating area or relaxation area if the same does not exist and in case these facilities exist, better maintenance of the same will be included.

In addition to the above, there are many other minor and insignificant aspects and issues which need to be addressed overall, for a safe and healthy workforce all around the foundry clusters. Majority of them are mainly due to the illiterate and innocent nature of the work force, who are normally migratory from some part of the country to one of these clusters.

Invariably, they come in groups and settle down around the foundry clusters. There are many shades of complexity by way of religion, region, education, language spoken, cultural practices in addition to the personal level skills and traits.

But a common thread of poverty drives them far away from their natural home to wards these foundry clusters for making a living. As a result, one can easily see the entire family also moving along the bread winner and are spotted very close to the foundry environment.

Challenging task

In the above scenario, spreading awareness on OHS itself is challenging enough, leave alone implementing it. Anyway, with the drive from the unit owners, for whatever reasons it may be, the spread of OHS is encouraging and the results are supportive.

The above mentioned activities under the occupational safety area will also cover preventive and curative aspects to ensure sustainability. These activities will also require organization of workshops, exposures, introduction of equipment suppliers, preparation of comparative charts for variety of equipment, undertaking internal studies for understanding & conveying commercial viability of equipment to be bought, etc.

This will be followed by the enterprise owners to agree for making partial

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Table 2 - Menu of the shortlisted activities under the three categories

Occupational Health	Occupational Safety	Wellbeing of workers
<ul style="list-style-type: none"> Health examination of workers Health related communication Improvement in First Aid facility 	<ul style="list-style-type: none"> Introduction of mechanical chargers/ trolleys Designation of proper places to keep raw material/ coal/ scrap etc Walk ways clarity Personal Protective Equipments (PPEs) usage Placement of Fire Fighting Equipments Work Instructions for each machinery Proper placement of machineries along with safety guards 	<ul style="list-style-type: none"> Insurance of workers Improvement in drinking water Improvements in Toilets/ washrooms

investments for capital intensive activities where it is proposed that for kick-starting and creation of success stories in the cluster so that the other enterprises can replicate the same. Such award-winning success units are to be marked as model units for guiding future entries.

An important aspect of this project is post project "sustainability". In order to continue the progress and achievements made even after the formal closure of the project, the project aims at identifying agencies in related fields and in the local environment and entering into long term MOUs.

The process of short-listing and terms negotiations are on in many such entities in the fields of technical consultancy, OHS consultancy, medical facilities (general) and medical facilities (specialised).

Health examination camps with a special focus on preventive aspect

Health camps were organized as a general and specialised (eye camp) categories. (Give some data, here or as a reference). As a part of these health camps, usually, a small physical workshop is used to be held. Under this the following are done:

a) A video presentation followed by direct interaction with the work force on the perils of various forms of tobacco usage. This is very important and effective as most of the workforce in the foundry sector are tobacco addicts of different levels. Many of them are not even aware of the ultimate damage it can cause to one's body.

b) An important physical exercise is taught to overcome the likely backache in the long run, mainly due to the various ergonomic hazards of the mould setting which is the main inherent part of the foundry activity. This exercise, when done for a few minutes on a daily basis, will ensure protection from the otherwise painful backache due to set-in after about a few years of stereotyped mould setting activities.

Trainings on occupational safety

Many of the workforce are not even aware of the consequences of a molten metal (of about 1000oC) falling on some part of one's body. They crisscross the area with loosely clad Baniyan when Cupola is on and the slag point is splintering sparks of flame at a reasonable pressure.

They are taught through a rigorous training programme, many of the industrial accidents can easily be prevented through systematic implementation of an organization level culture of OHS. The training is done using slides with pictures and mostly in their local languages. At the end of training sessions, their questions and doubts are also answered.

Workplace improvement that connects directly or indirectly with productivity

As a part of this OHS Project, when observation walk thorough are held, many work place improvements are suggested for better productivity as well as work place safety. A few of them are as below:

In a multi machine workshop environment, the concept of 'Armswing' space explained so that workers working on a machine does not endanger another worker working on a neighbouring machine.

In a belt-driven environment, loose garments are advised to be prohibited.

Around rotary machineries, lady workers with loose garments and jewellery are advised against.

Mechanised trolley system suggested for many material handling functions (done manually hither to).

Any steps/staircase advised to be clear of material stacking.

Firefighting equipment deployment suggested.

Partnerships with local medical hospitals

Local medical institutes have been identified to be involved in the project to sustain the activity in the long run. Occupational Health Expert, Dr Ashish Mittal, Project Coordinator, Tatheer Zaidi, Regional Coordinators presented the ongoing project to the senior management of these respective institutes.

After subsequent conversations with the respective institutes, three of the leading medical institutes located at Ludhiana (Punjab), Ajmer (Rajasthan) and Kolkata (West Bengal) got convinced and proposed

for their voluntary participations.

The names of these institutes are Dayanand Medical College (Ludhiana-Punjab), Miital Hospital (Ajmer-Rajasthan) and the All Institute of Hygiene & Public Health (Kolkata-West Bengal) which are providing their continuous and active support in health-related activities.

Established linkages with OHS experts with local associations

As indicated above, as one important requirement for sustainability (after the project) in each foundry cluster area OHS expertise are being enrolled for continuing the support to the units, by way of visits and counselling. Terms are worked out for MOU covering a reasonably long period for the continuous support to the foundry units in the OHS area.

Promising start

Overall, the project with a promising start was welcomed by many foundry owners. Some genuinely interested in the

wellbeing of their workforce, some for the fear of unnecessary legal entanglement (if an accident occurs) and some driven by the confidence on FMC for the monetary benefit (tasted through the other phase of the project by way of technical efficiency enhancement of foundries).

In either case, the cooperation (from the unit owners) is mixed and sluggish, but not negative. The workforce was naturally reluctant because of ignorance, but gradually becoming understanding. A few minor events emerge as 'Teacher Incident' and the demand for PPEs is distinctly increasing. The results, so far, are impressive and promising.

The efforts are in progress, and there is hope to implement sustainable OHS activities in 200 foundry enterprises by mid of 2015.



Tatheer Zaidi
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