Minutes of 36th meeting of the Technical Review Committee (TRC) under the Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008 held on 21st May, 2015 under the chairmanship of Shri R.K.Garg

The decisions of the Ministry as per the agenda are as follows:

Agenda Item No. 01: Import of waste/used rubber tyres for production of Tyre Pyrolysis Oil- Royal Carbon Black Private Limited (TPO)(12-40/2013-HSMD):

The matter pertains to import of waste/used rubber tyres for production of Tyre Pyrolysis Oil (TPO). In the Hazardous Wastes Rules, 2008, 'waste pneumatic tyres' (Basel No. B 3110) form part of Part B, Schedule III. Accordingly, it is permitted to be imported into the country only with the permission of MoEF. Accordingly, applications for import of waste tyre were being considered in the Ministry under the Hazardous Waste Rules, 2008 for their use in number of ways i.e. (i) recycling as a supplementary source for making rubber products, (ii) for mixing with Bitumen to improve the performance (iii) use directly as fuel in Cement Kiln, (iv) pyrolysis for recovery of oil and carbon. However, nearly two years back, Ministry of Petroleum and Natural Gas (MoP&NG) had indicated its reservation with respect to granting permission for import of waste and scraps of the rubber /shredded tyres in general and import for their use for generation of TPO in particular. Since then the decisions on applications for import of waste tyres in one or multiple cut/scraps of rubber/ shredded tyres scrap/ chips for synthesis of pyrolysis oil are being kept in abeyance in the Ministry for want of clarifications on the issue from DGFT and MoP&NG. During the interregnum, a large number of proposal for import of waste/used tyre for TPO have been kept pending within the Ministry which also include those which have been referred by DGFT. Subsequent to regular communication from the Ministry with DGFT and MoP&NG for resolving the matter, an Inter-Ministerial committee (IMC) meeting on this issue was held on 12.12.2013 in DGFT under the chairmanship of Shri D K Singh, IAS, Addl. DGFT. However, no communication was received towards resolving the matter. Joint Director General of Foreign Trade, vide email dated 19-01-2015 given its approval for processing of all such requests for import of scrap tyres for pyrolysis purpose in this Ministry under the provision of Hazardous Waste Rules, 2008. They have acknowledged that Ministry of Petroleum and Natural Gas (MoPNG) had given in principle decision to allow cases subject to certain safeguards suggested by them. DGFT is separately taking up the matter with MoPNG in the matter for clarifying the safeguards. However, since the issues wrt pyrolysis are basically environmental issues, to avoid delay in formulation of safeguard, it was decided in the Ministry to get the safeguard formulated by TRC which is technical committee constituted under the HW Rules, 2008 of the Ministry.

Accordingly, the matter was considered during the 35th meeting of TRC held on 20th February 2015.The Committee observed that most of these plants are in the small and medium sector and many of them are based on Chinese technology. To the committee's knowledge there is no established technology. The committee opined that

a few plants operating presently should be visited to evaluate their environmental consequences and the requisite preventive and mitigative measures and their effectiveness to ensure environmental protection.

In the meantime Ministry received Standard Operating Procedure with respect to processing of waste tyres for the generation of Tyre Pyrolysis Oil from Central Pollution Control Board (**Annexure I**) and simultaneously representation from All India Scrap Recyclers Association forwarding suggestions with respect to issue of safeguards for Tyre Pyrolysis Oil (**Annexure II**). As per the decision of the 35th meeting of TRC, the unit of Royal Carbon Black Private Limited in Mumbai involved in Pyrolysis process was visited by Sh R. K. Garg, Chairman, TRC on 16th May, 2015.

The Committee deliberated with respect to the formulation of safeguard/ **Standard Operating Procedures** (SOP) for the Tyre Pyrolysis Oil (TPO) Processing plant on the basis of information available from all the above cited sources. The Committee noted that Pyrolysis is a thermal degradation process carried out in the absence of oxygen/air so that combustion of material does not take place. Pyrolysis of tyres and rubber products produce low-grade oils, pyrolysis gas (pyro-gas), carbon-black-char and steel. Technologies are available to produce high quality oils with comparable viscosity and calorific values comparable with diesel and gasoline type fuels. However, it was reported that tyre pyrolysis has not been economically viable in United States as full-scale operations could not be achieved due to costly clean-up operations.

Environmental and safety concerns in these plants arise due to fire hazards, emission of fine carbon particles and odor nuisance and need for flaring of excess pyro gas.

The Committee noted that basically there are two types of technology being used in the country for generation of TPO viz. Batch Process and Continuous Process.

(i) Batch Process

Most of the tyre pyrolysis units in the country are batch processes producing primarily oils for use as fuel oil in industrial furnaces. The pyro-gas generated from pyrolysis process is used as fuel in the pyrolysis process. In these plants the full tyres are fed to the pyrolyser manually and at the end of the process the steel wire and carbon are taken out manually. After removing the steel, the labour is sent into the reactor having carbon to feed it with tyres. This leads to lot of carbon spillage, exposure of workers to fine carbon particles and working in the unconducive environment in the pyrolyser. In some of the plants some explosions also have been reported due to frequent opening of the reactors in the hot conditions. The flare system is also not properly designed. Since the system is not completely closed, the odor problem is prevalent throughout the plant. These are some of the major shortcomings of such plants.

(ii) Continuous Process

In this technology the tyres are mechanically cut to about 20mm by 20mm size. This causes the embedded steel to be liberated. This liberated steel is then separated using a magnet. Steel free rubber is then fed into a closed reactor. This reactor processes the tyres and never needs to be opened. The oil phase is collected in tanks after condensing and the carbon phase is conveyed via closed conveyors into a Hopper. In

this system the entire system is a closed circuit. The reactors run continuously and are never opened to remove steel or carbon from the system causing no carbon pollution or discharge in the air. This system is generally known as the continuous pyrolysis technology.

The Committee noted that since most of the tyre pyrolysis units in the country are batch processes, it may not be feasible to ban such units all over the country. Accordingly, the Committee suggested safeguards with respect to both the kind of technology for generation of TPO so as to make them environmentally sound and simultaneously addressing the safety aspects. The **SOPs** for the Plants producing pyrolysis oil and carbon-black-char including import of waste pneumatic tyres for the purpose as recommended by the TRC with respect to two different existing technology is as enumerated below:

Decision with regard to Standard Operating Procedure:

(A) Batch process:

i. The feed to the pyrolysis reactor should be devoid of steel. This means that crumb rubber only should be fed to the reactor. Further the feeding arrangement of the rubber crumb to the reactor should be mechanized.
ii. The initial heating of the reactor should be done by liquid fuel or gas. The flue gas should be released to the environment through a chimney of at least 30 metres height.
iii. After initial heating, during the pyrolysis process, the pyro gas generated within the plant should be used as a fuel.
iv. Excess pyro gas if any should be flared through properly designed flaring system of adequate capacity considering the emergency situation in which the entire gas may have to be flared. The flaring should be done at a minimum height of 30 metres.
v. Adequate instrumentation for measurement and control of temperature and pressure along with safety interlocks in case of increase of temperature or pressure to cut off heating of the reactor should be provided. Automatic control systems such as Programmed Logic Control (PLC) shall be adopted. It should be ensured that the reactor is under positive pressure all the time.
vi. In order to control fugitive emissions from the reactor during operation, proper sealing should be ensured.
vii. The collection of the oil from the condensers should be in closed vessel and storage also should be in closed tanks with suitable vents. There should be no manual handling of oil. Transfer of oil should be through pumps.
viii. At the end of the pyrolysis process the reactor has to be cooled before the removal of carbon. During this process, the reactor should be purged with nitrogen.
ix. The removal of carbon should be started after the reactor's temperature has come down to below 50^{o}C.

x. The removal of carbon should be through a mechanized system and it should be ensured that no spillage takes place during the collection of the carbon in the bags.
xi. Adequate number of sensors along with alarm system should be provided at suitable locations throughout the plant to detect any leakage of flammable vapors from the system.
xii. Adequate fire-fighting system like sprinklers and fire hydrant with necessary pumping system and water storage should be provided.
xiii. The plot size should be adequate for storage of crumb or cut tyres, oil and carbon black in addition to the pyrolysis plant and accessories as well as enough space for movement of fire tender in case of any emergency. A minimum indicative size of small plant is about 3000 square metres.
xiv. The plant shall possess clearance certificates issued by concerned departments.
xv. The carbon black and the oil obtained from the process should be supplied only to actual users/processors.
xvi. The waste water generated in the process from condensers or any scrubbers should be properly treated in an Effluent Treatment Plant and the sludge generated should be sent to Treatment Storage Disposal Facilitiy (TSDF).
xvii. Oil containing water condensate should be treated in suitable ETP. Oily sludge/residues should be disposed through TSDF.

(B) Continuous Process:

The continuous plants operating in the country do not suffer from most of the environmental and safety problems encountered in the existing batch plants. However, even for the continuous pyrolysis plants the following facilities have to be ensured:

i. The feed to the reactor is in the form of crumbs, it should be ensured that during handling/ transfer of the crumbs there should be suitable system for suction and collection of fugitive fibres.
ii. The feeding system should be provided with air-lock arrangements so that no air enters the reactor during feeding.
iii. The initial heating of the reactor should be done by liquid fuel or gas. The flue gas should be released to the environment through a chimney of at least 30 metres height.
iv. After initial heating, during the pyrolysis process, the pyro gas generated within the plant should be used as a fuel.
v. Excess pyro gas if any should be flared through properly designed flaring system of adequate capacity considering the emergency situation in which the entire gas may have to be flared. The flaring should be done at a minimum height of 30 metre.
vi. Adequate instrumentation for measurement and control of temperature and pressure along with safety interlocks in case of increase of temperature or pressure to cut off heating of the reactor should be provided. Automatic control systems such as Programmed Logic Control (PLC) shall be adopted. It should be ensured that the reactor is under positive pressure all the time.

vii. In order to control fugitive emissions from the reactor during operation, proper sealing should be ensured.
viii. The collection of the oil from the condensers should be in closed vessel and storage also should be in closed tanks with suitable vents. There should be no manual handling of oil. Transfer of oil should be through pumps.
ix. The removal of carbon should be through a mechanized system and it should be ensured that no spillage takes place during the collection of the carbon in the bags. Moreover an air-lock should be provided to ensure no entry of air into the reactor.
x. Adequate number of sensors along with alarm system should be provided at suitable locations throughout the plant to detect any leakage of flammable vapors from the system.
xi. Adequate fire-fighting system like sprinklers and fire hydrant with necessary pumping system and water storage should be provided.
xii. The plot size should be adequate for storage of crumb or cut tyres, oil and carbon black in addition to the pyrolysis plant and accessories as well as enough space for movement of fire tender in case of any emergency. A minimum indicative size of small plant is about 3000 square metres.
xiii. The plant shall possess clearance certificates issued by concerned departments.
xiv. The carbon black and the oil obtained from the process should be supplied only to actual users/processors.
xv. The waste water generated in the process from condensers or any scrubbers should be properly treated in an effluent treatment plant and the sludge generated should be sent to TSDF.
xvi. Oil containing water condensate should be treated in suitable ETP. Oily sludge/residues should be disposed through TSDF.

AGENDA ITEM NO 02: M/s Shiva Petro – Synth Specialties Ltd, Mumbai.- Clarification for inter-state movement of used/ Waste oil as per the rules 20(3) of Gazettes Notification of Hazardous Waste Rules, 2008 (23-213/2014-HSMD)

The applicant M/s Shiva Petro located in Mumbai has submitted representation with respect to non receipt of hazardous waste from Goa for recycling due to certain directions of Goa PCB. The matter was considered in the 33rd and 35th TRC meeting held on 28th October 2014 and 20th February 2015. The committee noted that the reason for Goa PCB not allowing inter-state movement of Hazardous Waste (used oil/waste oil) was that the recyclers outside Goa were not filing returns on Form 4 as well as Form 6 as required under the H.W. Rule, 2008. The applicant was therefore advised to make sure that the recyclers outside the State of Goa also file the returns to the respective SPCB (including Goa) from whose jurisdiction the Hazardous waste were obtained for recycling. The committee noted that there is lack of clarity on sending the returns of waste disposed or recycled from one state to another. Since, the Goa PCB seems to have insisted on getting returns from recyclers in the other state of waste generated in their state (Goa), the recycler was advised by the TRC to send returns to both the State Boards.

M/s Shiva Petro – Synth Specialties Ltd, Mumbai referring to the above directions of the Ministry on the basis of TRC recommendations has now informed that they have been submitting the annual returns in Form 4 and Form 12(copy enclosed with the letter) to Goa Pollution Control Board. The receipt has been duly acknowledged as is evident from the acknowledgement on letter. The applicant has mentioned that the stand taken by GPCB is just to hamper their upliftment of contracted quantities of used/waste oil and give monopoly to only one party registered in the state of Goa. The applicant has requested the Ministry to give clear instructions to GPCB to allow them upliftment of hazardous waste as per the law.

The committee deliberated on the issue in detailed and recommended as follows.

Decision: The issue under consideration is not a technical issue and also does not pertain to any clarification/interpretation of Hazardous Waste Rules, 2008, beyond what has already been provided by this Committee in its 35th Meeting held on 20th February 2015. If the applicant feels that the Goa Pollution Control Board is doing injustice they can approach the appropriate authority. As far as this Ministry is concerned it has no further role in this matter.

AGENDA ITEM NO 03: Export of Slag from Precious Metals processing for further refining intimation- M/s Hindalco Industries Limited

The applicant has informed that they will be exporting the slag from Precious Metals processing for further refining in line with Schedule III Part B of the HW Rules, 2008 and Annexure IX of the Basel Convention (No. B1100). The committee was requested deliberate on the issue with regard to the Hazardous Waste Rules, 2008.

Decision: The Committee noted that from the letter it is seen that no information is provided in respect of the process in which slag is generated and the constituents and their concentration in the slag. The applicant should be asked to provide the aforesaid information and come for a presentation before the Committee.

AGENDA ITEM NO 04: Finalization of Standard Operating Procedures with regard to import of Waste Pneumatic Tyres for recycling- reg

SOPs as developed by CPCB for considering such applications for import of waste pneumatic tyres could not be taken up for deliberation due to paucity of time. The matter will be discussed in detail in the TRC scheduled on 3rd June 2015.

AGENDA ITEM NO 05: Finalization of Standard Operating Procedures with regard to import of Used PET Bottle Scrap/ plastic scrap for recycling -reg.

SOPs as developed by CPCB for considering such applications for import of Used PET Bottle Scrap/ plastic scrap could not be taken up for deliberation due to paucity of time. The matter will be discussed in detail in the TRC scheduled on 3rd June 2015.

AGENDA ITEM NO 06: Finalization of Standard Operating Procedures with regard to import of lead scrap for Secondary Lead Recycling Units-reg.

SOPs as developed by CPCB for considering such applications for import of Lead scrap/waste such as scrap full lead acid battery, Lead acid battery plates and other lead scrap could not be taken up for deliberation due to paucity of time. The matter will be discussed in detail in the TRC scheduled on 3rd June 2015.

AGENDA ITEM NO 07: Request for amendment in the NOC with respect to test report for tyres as required by customs.

(a) M/s S&J Granulate Solutions(P) Ltd., Vapi, Gujarat (F.No. 5-19/2011-HSMD)- The matter was considered in the 56th Meeting of Expert Committee held on 11.3.2015 and the Committee recommended import of 16000 MT of old and used rubber tyres scrap(Cut/shredded/baled press) for manufacturing of crumb rubber.

(b) M/s S.E. Power Ltd., Vadodara (F.No. 5-36/2014-HSMD):- The application pertains to import of used/old rubber tyres scrap/pairings. The matter was considered in the 55th Meeting of Expert Committee held on 12 & 13 February, 2015 and the Committee recommended import of 4000 MT of old and used rubber tyres scrap(Cut/shredded/baled press) for manufacturing of crumb rubber.

Now both the applicants have requested to revise the NOC with respect to testing requirement as required under the HW Rules, 2008. They have submitted that old & used rubber tyres are in solid state and physically verifiable. Hence, a compulsory compliance requirement with respect to test report of analysis of hazardous waste from laboratory is not required to us.

Decision for 7(a) and 7(b): The matter was considered by the TRC and it was agreed that in case of scrap tyres and tubes, visual inspection is adequate and no lab testing is required. In case if record is to be maintained a photograph of the consignment is taken.

****