Newsletter Vol. 2

The Study for the Development of an Integrated Solution Related to Industrial Waste Management in the Industrial Pole of Manaus

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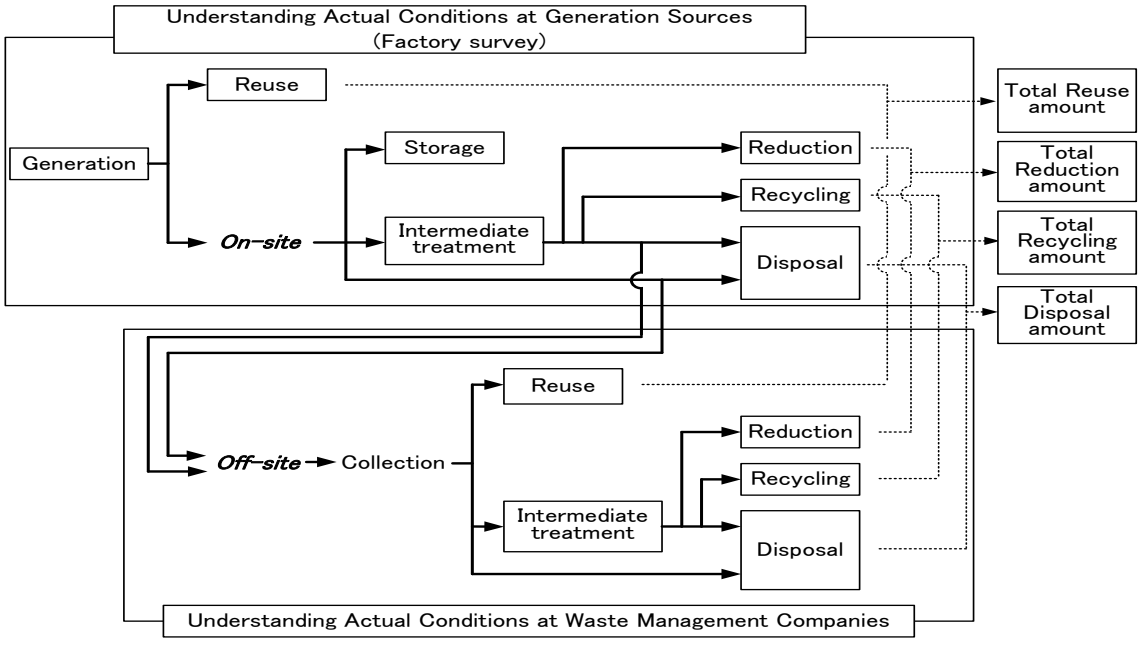
Industrial Waste: Seeing the big picture

What are the actual conditions at the generation sources of industrial waste? Although industrial waste is invariably generated through the various manufacturing processes of materials, there is currently no firm understanding of the characteristics and amount of that waste. The JICA study team, SUFRAMA and other counterparts are addressing that issue through the activities outlined below.

In order to grasp the actual conditions of industrial waste disposal, the most basic and essential step is creating a flowchart, like the one shown in the figure below. The key is to divide the flow of waste into two large categories: (a) generation sources, which we can call “On-site”, and (b) waste discharged from generation sources, which we term “Off-site”. The inventory currently used in Brazil tells us “what, to whom and how much” a factory has discharged, but does not reveal the process of off-site disposal. This is why it is necessary to grasp the conditions of waste management, as shown in the chart, and clarify the On-site flow at generation sources and inlet for Off-site flows, while also grasping the actual conditions at waste management companies to get a clear picture of the entire Off-site flow.

The JICA study team is now in the process of carrying out a number of field surveys to clarify the waste flow. In this newsletter, we outline those that have been initiated thus far.



Outline of field surveys

In the first phase, we conducted various surveys in order to obtain baseline data. Based on the data from these surveys, we will identify the current IWM, both on-site and off-site, and issues for their improvement by the end of the first phase in September.

Surveys conducted in the first phase:

- survey of factories
- survey of waste management companies
- survey of radioactive waste management

In addition to surveys recently initiated in June:

- survey of health waste management
- survey of construction waste management

Field Surveys of the Study

(i) Factory Survey

Objectives

The objectives of this survey are:

- ✧ To understand the generation amount of industrial (factory) waste in PIM approved by SUFRAMA.
- ✧ To understand the waste management practices of the factories in PIM in terms of storage, reuse/recycle, discharge, collection, intermediate treatment and final disposal.
- ✧ To research needs of reuse/recycling and waste exchange of Non-HIW (Non Hazardous Industrial Waste) and HIW (Hazardous Industrial Waste) according to the categories of industry and/or industrial wastes; and
- ✧ To understand opinions of factories (generation sources) regarding Non-HIW and HIW management and environmental protection.

Content of the Survey

1) Factories targeted in the survey

The target factories shall be those approved by SUFRAMA within the 10,000 km2 area Manaus Free Trade Zone, i.e. the PIM area under the jurisdiction of SUFRAMA.

There are 457 of these factories in Manaus city overall, of which 214 are large-scale and 243 are small-scale factories (as listed in Part 1 and Part 2, respectively, of “Perfil das Empresas com Projetos Aprovados Pela SUFRAMA, DEZ/2008”).

Furthermore, the number of these factories according to subsector, using the same source as above, is shown in the following table.

Table 1: Number and Type of Factory

Factory Code	Description of subsector	Number of Factory
F01	Beverage (soft drink, alcoholic) and vinegars	16
F02	Leathers, skins and similar	0
F03	Printing and graphical company	16
F04	Electric, electronic and communication materials	131
F05	Wood	4
F06	Mechanical	28
F07	Metallurgy	48
F08	Non metallic minerals	6
F09	Furniture	5
F10	Paper, cardboard, cellulose	13
F11	Rubber	3
F12	Food products	14
F13	Chemical	34
F14	Plastic material products	76
F15	Textile	1
F16	Clothing, fabric and travel goods	2
F17	Transport material	33
F18	Construction	7
F19	Others	20
Total		457

2) Waste targeted in the survey

The target waste in the survey is that “generated from the industrial plants in the PIM both at production process and non-production process”, which we refer to as Industrial Waste (IW)

IW are categorized as Hazardous Industrial Waste (HIW) and Non Hazardous Industrial Waste (Non-HIW).

These general categorized were further divided by the JICA study team for the survey as follows.

Table 2: Non-Hazardous Industrial Waste

Non-HIW Code	Type of Non-HIW
NH01	Kitchen waste (include waste from animal such as bone, skin, hair)
NH02	Wood
NH03	Paper
NH04	Plastic or polymers and resins
NH05	Textile and fiber

NH06	Animal oil, Vegetable oil
NH07	Rubbers and leather
NH08	Ash/dust from coal-fired power plants, etc.
NH09	Metals and metal alloys such as aluminum, copper, bronze
NH10	Ceramic and glasses
NH11	Stone, sand or material that have composition of soil such as tile, brick, gypsum, cement
NH12	Mixed waste (This code shall be applied in case wastes are discharged without separation.)
NH13	Others

Table 3: Hazardous Industrial Waste

HIW Code	Type of HIW
HW01	Inorganic acid
HW02	Organic acid
HW03	Alkalis
HW04	Toxic compounds
HW05	Inorganic compounds
HW06	Other inorganics
HW07	Organic compounds
HW08	Polymeric materials
HW09	Fuel, oil and grease
HW10	Fine chemicals and biocides
HW11	Treatment sludge
HW12	Ash from incinerators
HW13	Dust and air pollution control (APC) products
HW14	Other hazardous substances (besides HW01-HW13)
HW15	Hazardous materials from non-production processes

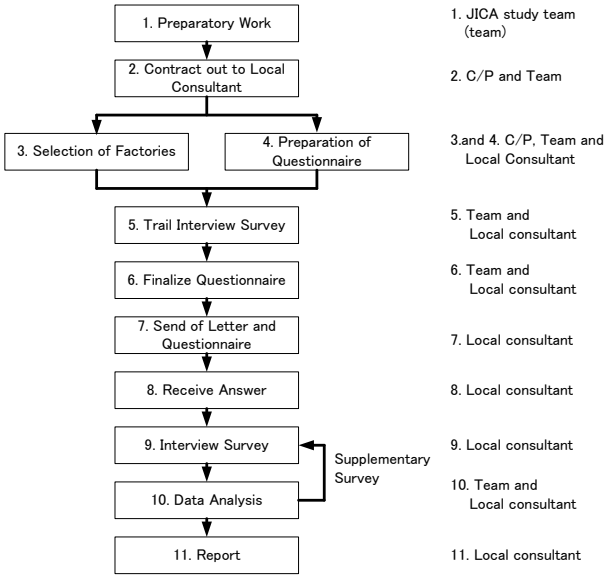
Survey Method

The following flowchart shows the method used for the factory survey, from contracting a local consultant to preparation of questionnaires and interview questions, and finally data analysis and reporting.

Currently, the JICA study team and a subcontractor are sending the questionnaire sheets to all 457 factories and will visit and interview at least 200 factories.

Schedule

The survey commenced in April and will be concluded in August.



(ii) Survey of Waste Management Companies

Objectives

The objectives of this survey are:

- ✧ To understand the waste management practices of companies that deal with those wastes discharged from plants in the PIM.
- ✧ To investigate the flow of waste as conducted by waste management companies consigned for the collection, transportation, treatment (e.g. the reuse, recycle and detoxification) and final disposal of industrial waste from the PIM.

Content of the Survey

1) Companies targeted in the survey

The waste management companies (WMCs) targeted in this survey are those which have IPAAM-issued environmental licenses (i.e. operation licenses) to conduct .waste management activities.

The main waste management activities are as follows.

- ✧ Collection, storage and transportation
- ✧ Treatment and recycle
- ✧ Final disposal

However, some waste management companies, especially waste recyclers, are not categorized by the above activities' code in the IPAAM database. Thus, for the purposes of the study, the database was carefully checked to include all the waste management companies in the survey list and, as a result, 90 companies were targeted in total.

Classification	Number of the companies
Storage & Transportation	21
Treatment	26
Transportation & Recycling	10
Recycling	17
Transportation, Treatment and Recycling	2
Transportation & Final disposal	3
Others	5
Not identified	6
Total	90

2) Wastes targeted in the survey

The target wastes in the survey of waste management companies are the same as those for the factory survey (see tables 2 and 3 above).

3) Survey Method

This survey is also being conducted by a locally subcontracted consulting firm which will carry out direct interviews with the personnel responsible for these processes who know the type and amount of wastes they are transporting, recycling, treating, and land filling. The subcontractor has sent questionnaire sheets in advance and then, through interviews at the companies, will confirm and fill in the required data.

Schedule

The survey commenced in May and will be concluded in August.

(iii) Radioactive Waste Survey

Objectives

The objectives of this survey are:

- ✧ To understand the management of radioactive waste in the factories and medical institutions in PIM (Industrial Pole of Manaus).
- ✧ To understand the radioactive waste disposal after discharge from the generation sources in terms of collection, storage, treatment and final disposal.

Content of the Survey

In order to pursue the above-mentioned objectives, the JICA study team and a subcontractor are now conducting the following tasks:

- ✧ A literature study,
- ✧ An interview survey with the federal organization(s) responsible for radioactive waste management in accordance with the questionnaire sheet made by the JICA study team, and
- ✧ An interview survey with the 5 (five) identified generation sources according to the questionnaire sheet made by the JICA study team.

Schedule

- ✧ Mid-April: Commencement of the work
- ✧ Mid-June: Completion of literature study and interview survey to the federal and/ or state organization(s) responsible for radioactive waste management
- ✧ Mid-July: Completion of interview survey to the 5 (five) generation sources

Contact us

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