

Block I      General details	
1	<p><b>Location of the PCB disposal facility:</b></p> <p>Name of Facility: Z.E.R.O. Japan Co., Ltd.</p> <p>City: Tokyo Country: Japan</p> <p><i>(Provide address information in Block IV)</i></p>
2	<p><b>Licence / authorization:</b></p> <p>Is this facility licensed or authorized to handle PCBs? x Yes <input type="checkbox"/> No</p> <p>If "Yes":</p> <p>(i) Nature of licence / authorization: As license of local authority is required it will have to be reapplied at each treatment location</p> <p>(ii) Please submit the licensing history <i>(please attach to this questionnaire)</i></p> <p>Issuing authority <i>(name)</i>: ( at existing location it is Chiba Prefecture )</p> <p><input type="checkbox"/> National XLocal or <input type="checkbox"/> Independent</p>
3	<p><b>Please provide information on storage at the facility including:</b></p> <p>( mobile plant to be installed at customer's side )</p> <p>Capacity for the various PCB waste and equipment types:</p> <p>Method:</p> <p>Holding time:</p>
4	<p><b>Worker protection</b> <i>(Please summarize protective measures applied during treatment of PCB wastes)</i></p> <p>Protective Clothing</p> <p>Does the facility have an accident book? <input type="checkbox"/> Yes x No ( however, customer running the plant is obliged to inform to local authority in case of accident )</p> <p>Most frequent cause(s) of incidents involving PCBs:</p>

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**Opinion box - PCB Management issues** *(Please describe briefly)*

What are your major concerns?

Can you identify research and development needs in PCB management that would be beneficial for your region and waste managers worldwide?

**Block II      Types of PCB wastes**

**Part A: Treatment of PCB containing equipment/material**

**Part A1: Metallic Parts**

A1.1	Types of metallic PCB equipment/material treated:	Limitation on waste accepted <i>(please specify, if appropriate)</i>		
		Concentration <i>(specify the unit)</i> unit: <b>min</b> <b>max</b>		Quantity <i>(specify the unit)</i> unit:
	X Equipment containing 100 % PCB			
	X Equipment containing mineral oil contaminated by PCB			
	X Others: lamp ballast, certain secondary waste			
<p><i>Please specify any other limitation on waste accepted:</i></p> <ul style="list-style-type: none"> <li>- dismantling required for sizes over 60cm x 60cm x 90cm</li> <li>- certain limitations with regards to corrosive materials and some chemical elements</li> </ul>				
A1.2	<p><b>Presentation of metallic equipment/material</b></p> <p>In what form must the metallic PCB equipment/material be presented:</p> <p>X Drums</p> <p>X Other packaging: note: plastic containers cannot be treated</p> <p>x Other constraints: Treatment chamber size: 60cm x 60cm x 90cm</p>			

A1.3

**Treatment of metallic PCB equipment/material**

Immediate destruction of metallic equipment/material containing PCB? Yes  No x

If 'Yes', please specify the applied technology in Part III

Extraction of PCB? Yes  No x

If 'Yes':

- please specify the applied technology in Part III
- Is the decontaminated metallic equipment/material subjected to reuse/recycling? Yes x No

If 'Yes', please specify in **Block II Part C** (Reuse and recycling)

**Part A: Treatment of PCB containing equipment/material**

**Part A2: Non-metallic Parts**

A2.1	Types of non-metallic PCB equipment/material treated:	Limitation on waste accepted <i>(please specify, if appropriate)</i>		
		Concentration <i>(specify the unit)</i>		Quantity <i>(specify the unit)</i>
		unit:		unit:
		<b>min</b>	<b>max</b>	
	X PCB-containing materials (clothes, cables, etc.)			
	X PCB-contaminated residues, sludges			
	X PCB-contaminated soils and sediments			
	X Packaged / drummed waste			
	X Other: activated carbon			
	<i>Please specify any other limitation on waste accepted:</i> - size to be under 60cm x 60cm x 90cm - certain limitations with regards to corrosive materials and some chemicals			
A2.2	<p><b>Presentation of non-metallic equipment/material</b></p> <p>In what form must the non-metallic PCB equipment/material be presented:</p> <p>X Drums</p> <p>X Other packaging: plastic containers cannot be treated</p> <p>x Other constraints: size of treatment chamber: 60cm x 60cm x 90cm</p>			

A2.3

**Treatment of non-metallic PCB equipment/material**

Immediate destruction of non-metallic equipment/material containing PCB? Yes  No x

If 'Yes', please specify the applied technology in Part III

Extraction of PCB? Yes x No

If 'Yes':

- please specify the applied technology in Part III
- Is the decontaminated non-metallic equipment/material subjected to reuse/recycling? Yes x No x ( depending on material )

If 'Yes', please specify in **Block II Part C** (Reuse and Recycling)

**Part B: Treatment of PCB oils and PCB waste oils**

B1	Types of PCB oils and PCB waste oils treated:	Limitation on waste accepted <i>(please specify, if appropriate)</i>		
		Concentration <i>(specify the unit)</i>		Quantity <i>(specify the unit)</i>
		unit:		unit:
		min	max	
<input type="checkbox"/> 100 % PCB oils				
<input type="checkbox"/> Mineral oils contaminated by PCB				
<input type="checkbox"/> Waste oils contaminated by PCB				
<input type="checkbox"/> Other:				
<p><i>Please specify any other limitation on waste accepted:</i></p>				
B2	<p><b>Presentation of PCB oils and PCB waste oils</b></p> <p>In what form must the PCB oils and PCB waste oils be presented:</p> <input type="checkbox"/> Drums <input type="checkbox"/> Other packaging: <input type="checkbox"/> Other constraints:			
B3	<p><b>Treatment of PCB oils and PCB waste oils</b></p> <p>Please specify the applied technology for the destruction of PCB oils and PCB waste oils in Part III</p>			

**Part C: Reuse & Recycling of decontaminated PCB equipment/material**

<p><b>C1</b></p>	<p><b>Types decontaminated PCB equipment/material treated:</b></p>	<p><b>Limitation on waste accepted</b> <i>(please specify, if appropriate)</i></p> <p><b>Quantity</b> <i>(specify the unit)</i></p> <p>unit:</p>
	<p>X Transformers</p>	
	<p>X Capacitors</p>	
	<p>X Materials (clothes, cables, etc.)</p>	
	<p>X Residues, sludges</p>	
	<p>X Soils and sediments</p>	
	<p>X Other: activated carbon</p>	
	<p><i>Please specify any other limitation on waste accepted:</i></p> <ul style="list-style-type: none"> <li>- certain limitations with regards to corrosive materials and some chemicals</li> <li>- dismantling has to be possible to sizes under 60cm x 60cm x 90cm</li> </ul>	
<p><b>C2</b></p>	<p><b>Presentation of decontaminated PCB equipment/material</b></p> <p>In what form must the decontaminated PCB equipment/material be presented:</p> <p>X Drums</p> <p>X Other packaging:</p> <p>x Other constraints: certain plastic packaging/container not treatable</p>	

C3

**Treatment of decontaminated PCB equipment/material**

Reuse and Recycling of decontaminated PCB equipment/material? Yes x No

If 'Yes', please specify the applied technology in Part III

Is the decontaminated PCB equipment/material disposed of? Yes x No x ( depending on material )

If 'Yes', please specify:

Transport to the disposal site? Yes  No x ( customer will arrange )

If 'Yes':

International transport

National transport

Location of disposal site: depends on to be disposed of products and location of installation of mobile plant

Please provide a short description of disposal site:

Block III Detailed information on applied technologies		
1	The following description refers to Block II, Part:	Type of PCB waste or decontaminated equipment/material:
	<input checked="" type="checkbox"/> A1 (Treatment of metallic PCB equipment/material)	Capacitor, transformer, lamp ballast etc.
	<input checked="" type="checkbox"/> A2 (Treatment of non-metallic PCB equipment/material)	Clothes, Activated Carbon, Sludge/Soil. etc
	<input type="checkbox"/> B (Treatment of PCB oil and PCB waste oil)	
	<input checked="" type="checkbox"/> C (Reuse and recycling of decontaminated PCB equipment/material)	Recyclable materials like metals and carbon will be re-used
2	<p><b>Applied technologies</b> (Please specify the technology used for disposal):</p> <p><input type="checkbox"/> Pyrolysis / gasifiers</p> <p><input type="checkbox"/> Gas Phase Chemical Reduction (GPCR)</p> <p><input type="checkbox"/> Base Catalysed Decomposition (BCD)</p> <p><input type="checkbox"/> Sodium Reduction</p> <p><input type="checkbox"/> Super-Critical Water Oxidation (SCWO)</p> <p><input type="checkbox"/> Plasma Arc</p> <p><input type="checkbox"/> Molten Salt Oxidation</p> <p><input type="checkbox"/> Solvated Electron Technology</p> <p><input type="checkbox"/> Retrofilling</p> <p>x Other: Vacuum Thermal Recycling</p> <p><b>Type of technology (1-sentence description):</b> Thermal Extraction of PCB-Oil in Vacuum</p> <p><b>Description of the technology</b> please provide additional information as appropriate (<i>summarize here and, if necessary, attach documentation</i>) Evaporation of PCB-oils under vacuum and temperature in a specially designed vacuum furnace with PCB-oil recovering unit</p> <p><b>Commissioned?</b> X Yes <input type="checkbox"/> No      Year: 1999</p> <p><b>Can the technology be used in a mobile facility?</b> X Yes <input type="checkbox"/> No</p>	
3	<p><b>State of development</b></p> <p>Does the technology exist as an industrial unit? X Yes <input type="checkbox"/> No</p> <p>If "No", please indicate when it will become operational:</p> <p>If "Yes", please indicate how many units exist: 2 + 4 on order</p> <p>In what countries: Japan</p>	

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**Pretreatment:**

Does the technology require any pretreatment procedures?  Yes  No ( depending on size of product )

If "Yes", please specify required pretreatment procedures:

Thermal Desorption

Dilution

Low Temperature Rinsing

Electro-osmosis

Draining/Solvent washing

Dismantling if size of to be treated product is bigger than 60cm x 60cm x 90cm

Other:

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**Byproducts**

What byproducts does the technology produce? *(please specify below)*

Byproduct	Kind	Amount
Liquids:		L per tonnes of waste treated
Solids:		kg per tonnes of waste treated
Air:		m <sup>3</sup> per tonnes of waste treated

Does the technology allow all byproducts to be monitored for POPs\*/PTS\*\* before release?  Yes  No

If POPs\*/PTS\*\* are discovered, can the byproducts be returned to the process for further treatment?  Yes  No

Are any of the byproducts classified as other sorts of hazardous wastes?  Yes  No

If "Yes" please specify:

What volumes of such byproducts are generated by handling a unit volume of PCB wastes:

Can third party monitoring data be provided?  Yes  No ( on request certain data available )

*If "Yes", please attach to this questionnaire.*

\* POPs: Persistent Organic Pollutants  
\*\* PTS: Persistent Toxic Substances

How are byproducts disposed of? *(please describe briefly)*

<p><b>6</b></p>	<p><b>Efficiency</b></p> <p><i>(please specify, if appropriate)</i></p> <p>[ only extraction process ]</p> <p>Destruction efficiencies (DEs):            %</p>
<p><b>7</b></p>	<p><b>Monitoring &amp; Control of releases</b></p> <p>What technologies are used to monitor releases:</p> <p>Air: no online monitoring, only regular measurements in intervals specified in legislation</p> <p>Effluents:</p> <p>Solids: analysis of solids after treatment</p> <p>Are all releases monitored for POPs/PTS before release? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If POPs*/PTS** are discovered, can the releases be returned to the process for further treatment? X Yes <input type="checkbox"/> No</p> <p>Are any of the releases classified as hazardous wastes? <input type="checkbox"/> Yes x No</p> <p>If "Yes" please specify:</p> <p>What technologies are used/ required to monitor and treat any such releases prior to release:</p> <p>What volumes of such releases are generated by handling a unit volume of PCB wastes:</p> <p>Is third party monitoring data available? <input type="checkbox"/> Yes x No ( no request certain data can be provided )</p> <p><i>If "Yes", please attach to this questionnaire.</i></p> <p style="text-align: right;">* POPs: Persistent Organic Pollutants ** PTS: Persistent Toxic Substances</p> <hr/> <p>How are releases disposed of? <i>(please describe briefly)</i></p>

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**Disposal costs**

What are the *approximate* costs for applying the technology per unit<sup>‡</sup>, **including** costs for all technical pretreatment steps, **excluding** all costs **not** related to the technical application of the technology (transport costs, costs for disposal of decontaminated transformers/capacitors/materials, etc.)?

*Please specify type of treated/disposed PCB equipment/material/oil below:*

	Costs per unit <sup>‡</sup>	Currency
a)		
b)		
c)		
d)		
e)		
f)		
g)		

<sup>‡</sup> Specify the unit for a) to g):

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**Treatment capacities and scaling** (*tonnes per year for main waste & equipment types*)

Capacity of existing facilities: depends on to be treated products and materials

Can the technology be adapted to higher or lower capacities? Yes x No

If "Yes":

- (i) What is the capacity of the smallest commercially viable facility: units<sup>‡</sup> per year
- (ii) What is the capacity of the largest commercially viable facility: batch size of about 3t possible

Does the adaptation will cause additional costs? X Yes  No

If "Yes" specify the increase in costs for the adaptation (%) of the initial costs:

- (i) For smaller plants: %
- For larger plants: %

<sup>‡</sup> Please specify the unit:

**Block IV****Facility: Address and Service Information****1**

because of legal situation in Japan mobile plant will be installed on the site of the owner of the to be treated products

Facility Name: Address:

City/Town:

P.O. Box:

District/State:

Country:

Telephone:

Fax:

Email:

Web site:

Person completing form

Name: Lang, Peter

Position: General Manager

Parent Company (*if different*)

*Z.E.R.O. Japan Co., Ltd.*

Address: Shinjuku Nomura Bldg. 10f, 1-26-2, Nishi-Shinjuku, Shinjuku-ku

City/Town: Tokyo 163-0558

P.O. Box:

District/State:

Country: Japan

Telephone: 03 – 5381 1233

Fax: 03 – 3345 0995

Email:

<p><b>2</b></p>	<p><b>Other Services offered by the company</b></p> <ul style="list-style-type: none"><li><input type="checkbox"/> Laboratory analysis / testing</li><li><input type="checkbox"/> PCB waste packaging for shipment</li><li><input type="checkbox"/> PCB classification / labeling</li><li><input type="checkbox"/> Clean-up of PCB contaminated sites</li><li><input type="checkbox"/> PCB wastes transport</li><li><input type="checkbox"/> Other PCB-related services:</li></ul>
<p><b>3</b></p>	<p><b>Further information</b></p> <p>Identify any company information (brochures, notes etc...) provided separately and if you wish provide additional comments on your services in <b>not</b> more than 50 words:</p>