

Block I General details	
1	<p>Location of the PCB disposal facility:</p> <p>Name of Facility: "PCB-containing electrical equipment decontamination and thermal PCB destruction Facility"</p> <p>City: Vsevolozhskiy Region of Leningrad Area Country: Russia</p> <p><i>(Provide address information in Block IV)</i></p>
2	<p>Licence / authorization:</p> <p>Is this facility licensed or authorized to handle PCBs? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (The facility is at the design stage)</p> <p>If "Yes":</p> <p>(i) Nature of licence / authorization:</p> <p>(ii) Please submit the licensing history <i>(please attach to this questionnaire)</i></p> <p>Issuing authority <i>(name)</i>:</p> <p><input type="checkbox"/> National <input type="checkbox"/> Local or <input type="checkbox"/> Independent</p>
3	<p>Please provide information on storage at the facility including:</p> <p>Capacity for the various PCB waste and equipment types:</p> <ul style="list-style-type: none"> - up to 16 PCB-contaminated transformers - up to 10 tonnes of liquid PCB-containing wastes <p>Method:</p> <p>Specially designed tented and partially fenced storage pad</p> <p>Holding time:</p> <ul style="list-style-type: none"> - PCB-contaminated transformers – up to 60 days; - Liquid PCB-containing wastes – up to 10 days
4	<p>Worker protection <i>(Please summarize protective measures applied during treatment of PCB wastes)</i></p> <ul style="list-style-type: none"> - ensuring of the air-tightness of the technological equipment and of the transformers subject for decontamination; - placing of the transformers and technological tanks into the individual trays; - using welded pipe mains with minimum number of the flange connections at the product lines; - central inflow-exhaust ventilation in the working areas and local exhaust ventilation for the working places; - cleaning of the local ventilation exhausts in the absorbers filled with active carbon; - providing of the personnel with the individual protection means and overalls; - analysis of the PCB concentration in the working area air. <p>Does the facility have an accident book? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (The facility is at the design stage)</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?

Bad economical condition of the PCB-containing equipment owners which does not allow them purchase of the new equipment for replacement

Slow process of the implementation of the Stockholm Convention requirements for the POP.

Irregularity of the legal base regarding the waste treatment.

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

Necessity of the well-thought programme of the implementation of the Stockholm Convention requirements

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>	Quantity <i>(specify the unit)</i>
		unit:	unit:
		min max	
	<input checked="" type="checkbox"/> Equipment containing 100 % PCB		100%
<input type="checkbox"/> Equipment containing mineral oil contaminated by PCB			
<input type="checkbox"/> Others:			
<i>Please specify any other limitation on waste accepted:</i>			
A1.2	<p>Presentation of metallic equipment/material</p> <p>In what form must the metallic PCB equipment/material be presented:</p> <p><input type="checkbox"/> Drums</p> <p><input checked="" type="checkbox"/> Other packaging: air-tight containers</p> <p><input type="checkbox"/> Other constraints:</p>		

A1.3

Treatment of metallic PCB equipment/material

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

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

Extraction of PCB? Yes No

If 'Yes':

- please specify the applied technology in Part III
- Is the decontaminated metallic equipment/material subjected to reuse/recycling? Yes 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:
		min	max	
	<input type="checkbox"/> PCB-containing materials (clothes, cables, etc.)			
	<input type="checkbox"/> PCB-contaminated residues, sludges			
	<input type="checkbox"/> PCB-contaminated soils and sediments			
	<input type="checkbox"/> Packaged / drummed waste			
	<input checked="" type="checkbox"/> Other: clothes, isolation paper, cardboard, wooden parts and other non-metallic parts of the transformer		Up to 15%	18 tonnes per year
<p><i>Please specify any other limitation on waste accepted:</i></p>				
A2.2	<p>Presentation of non-metallic equipment/material</p> <p>In what form must the non-metallic PCB equipment/material be presented:</p> <p><input type="checkbox"/> Drums</p> <p><input checked="" type="checkbox"/> Other packaging: air-tight containers</p> <p><input type="checkbox"/> Other constraints:</p>			

A2.3

Treatment of non-metallic PCB equipment/material

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

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

Extraction of PCB? Yes No

If 'Yes':

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

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 checked="" type="checkbox"/> 100 % PCB oils		100%	250 tonnes per year
	<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>Presentation of PCB oils and PCB waste oils</p> <p>In what form must the PCB oils and PCB waste oils be presented:</p> <p><input type="checkbox"/> Drums</p> <p><input checked="" type="checkbox"/> Other packaging: air-tight containers</p> <p><input type="checkbox"/> Other constraints:</p>			
B3	<p>Treatment of PCB oils and PCB waste oils</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>C1</p>	<p>Types decontaminated PCB equipment/material treated:</p> <p><input checked="" type="checkbox"/> Transformers</p> <p><input type="checkbox"/> Capacitors</p> <p><input type="checkbox"/> Materials (clothes, cables, etc.)</p> <p><input type="checkbox"/> Residues, sludges</p> <p><input type="checkbox"/> Soils and sediments</p> <p><input type="checkbox"/> Other:</p>	<p>Limitation on waste accepted <i>(please specify, if appropriate)</i></p> <p>Quantity <i>(specify the unit)</i></p> <p>unit:</p> <p>100 pieces per year</p>
<p><i>Please specify any other limitation on waste accepted:</i></p>		
<p>C2</p>	<p>Presentation of decontaminated PCB equipment/material</p> <p>In what form must the decontaminated PCB equipment/material be presented:</p> <p><input type="checkbox"/> Drums</p> <p><input checked="" type="checkbox"/> Other packaging: containers</p> <p><input type="checkbox"/> Other constraints:</p>	

C3

Treatment of decontaminated PCB equipment/material

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

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

Is the decontaminated PCB equipment/material disposed of? Yes No

If 'Yes', please specify:

The transformers after decontamination are dismantled into the metallic and non-metallic parts. The metallic parts are cleaned from PCB until 50 ppm, cut into pieces and transported by the own transport to the recycling materials accepting offices in Saint Petersburg

Transport to the disposal site? Yes No

If 'Yes':

International transport

National transport

Location of disposal site: Leningrad Oblast, Vsevolozhskiy region, Kuzmolovskiy village, Experimental Site RSC "Applied Chemistry", block 243 and adjoining territory

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 (<i>Treatment of metallic PCB equipment/material</i>)	transformers
	<input checked="" type="checkbox"/> A2 (<i>Treatment of non-metallic PCB equipment/material</i>)	Solid combustible materials extracted from the transformers of various types
	<input checked="" type="checkbox"/> B (<i>Treatment of PCB oil and PCB waste oil</i>)	PCB-containing isolation liquids
	<input checked="" type="checkbox"/> C (<i>Reuse and recycling of decontaminated PCB equipment/material</i>)	Reuse of the transformers cleaned from PCB Recycling of the metallic parts of the dismantled transformers cleaned from PCB

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Applied technologies (Please specify the technology used for disposal):

- Pyrolysis / gasifiers
- Gas Phase Chemical Reduction (GPCR)
- Base Catalysed Decomposition (BCD)
- Sodium Reduction
- Super-Critical Water Oxidation (SCWO)
- Plasma Arc
- Molten Salt Oxidation
- Solvated Electron Technology
- Retrofilling
- Other: High temperature oxidation

Type of technology (1-sentence description):

Thermal destruction of PCB in the cyclone reactor.

Description of the technology please provide additional information as appropriate (*summarize here and, if necessary, attach documentation*)

PCB destruction: Liquid PCB-containing wastes are destroyed in the cyclone reactor which consists of a vertical cyclone furnace in which natural gas is burned and PCB is oxidized by the air oxygen in the high-temperature flow of the burning products. Due to the vertical circulating motion of the working gases inside of the furnace, high turbulence of the flow is reached which results in effective mixing. After that the gasses are supplied into the final burning chamber (flue) where PCB is finally destroyed under the temperature equating 1250-1400C and exuberance of oxygen. Hydrogen chlorine produced during PCB burning is neutralized immediately in the reactor by the caustic solution. Shredded solid PCB-containing non-metallic parts are destroyed in the flue which is equipped by the downloading device. The time of the product exposure to the high temperatures zone is not less than 2 seconds.

Commissioned? Yes No Year: 2000

Can the technology be used in a mobile facility? Yes No

Transformer decontamination: After PCB is drained from the transformer by the gravity drain (~95% from the original filling of the transformer), the transformer is cleaned by the multiple washing of its inner surface by the solvent vapours. Solvent vapours condense on the contaminated surface. Condensation resolves PCB and washes it from the transformer. In the evaporation cube the contaminated solvent undergoes constant regeneration. PCB requiring higher temperature for boiling are collected in the evaporation cube and regenerated solvent vapours are directed into the inner space of the decontaminated transformer. The evaporation-condensation cycle is repeated multiple times until inner surface of the transformer is cleaned to the 50 ppm of the residual PCB concentration. After decontamination the transformers may be refilled with another isolation liquid, containing no PCB, or they are dismantled. After dismantling, the metallic parts are recycled; the non-metallic parts are destroyed in the flue of the PCB destruction facility.

3	State of development Does the technology exist as an industrial unit? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If "No", please indicate when it will become operational: The operation is at the design stage. Operation start up in Russia is planned for the end of the year 2005. If "Yes", please indicate how many units exist: In what countries:
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4	Pretreatment: Does the technology require any pretreatment procedures? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If "Yes", please specify required pretreatment procedures: <input type="checkbox"/> Thermal Desorption <input type="checkbox"/> Dilution <input type="checkbox"/> Low Temperature Rinsing <input type="checkbox"/> Electro-osmosis <input checked="" type="checkbox"/> Draining/Solvent washing at the transformer decontamination site <input checked="" type="checkbox"/> Dismantling/Shredding of the transformer parts after decontamination <input type="checkbox"/> Other:
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5	Byproducts	
	What byproducts does the technology produce? <i>(please specify below)</i>	
	Byproduct	Kind
	Liquids:	Amount
		L per tonnes of waste treated
Solids:	Mixture of salts NaCl, Na ₂ CO ₃	1000 kg per tonne of waste treated
Air:	CO ₂ , NO ₂	0.024 tonnes per tonne of waste treated
<p>Does the technology allow all byproducts to be monitored for POPs*/PTS** before release? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If POPs*/PTS** are discovered, can the byproducts be returned to the process for further treatment? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Gas emissions are cleaned at the consequently installed carbon absorbers. After the first stage of cleaning the emissions are monitored for the concentration of the POP/PTS in case of emergency.</p> <p>Are any of the byproducts classified as other sorts of hazardous wastes? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>If "Yes" please specify:</p> <p>What volumes of such byproducts are generated by handling a unit volume of PCB wastes:</p> <p>Can third party monitoring data be provided? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</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>		
<p>How are byproducts disposed of? <i>(please describe briefly)</i></p> <p>Mixture of salts NaCl, Na₂CO₃, is supplied to the chlorine and NaOH production plant.</p>		
6	<p>Efficiency</p> <p><i>(please specify, if appropriate)</i></p> <p>Destruction efficiencies (DEs): 99,9996%</p>	

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Monitoring & Control of releases

What technologies are used to monitor releases:

Air: analytic method

Effluents: effluents are not produced

Solids: analytic method

Are all releases monitored for POPs/PTS before release? Yes No

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

Gas emissions are cleaned at the carbon absorbers in case of the emergency formation of the POP/PTS. Active carbon is produced by Donau Carbon company.

Are any of the releases classified as hazardous wastes? Yes No

If "Yes" please specify:

What technologies are used/ required to monitor and treat any such releases prior to release:

What volumes of such releases are generated by handling a unit volume of PCB wastes: Total ejection of the furnace gases after the cleaning is 24.12 kg, including 1.2 kg of solid substances and 22.92 kg of gaseous substances per tonne of PCB.

Is third party monitoring data available? Yes No

If "Yes", please attach to this questionnaire.

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

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

After the preliminary cleaning, gas emissions containing the harmful substances the concentration of which does not exceed the existing sanitary limits, are sprayed into the atmosphere.

8

Disposal costs

What are the *approximate* costs for applying the technology per unit[‡], **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 [‡]	Currency
	a) PCB-filled transformer decontamination (including destruction of the drained PCB)	3833.00	\$
	b) PCB destruction	1000.00	\$
	c)		
	d)		
	e)		
	f)		
	g)		
	[‡] Specify the unit for a) to g): a) pieces b) tonnes		
9	Treatment capacities and scaling (<i>tonnes per year for main waste & equipment types</i>) Capacity of existing facilities: 100 units [‡] per year Can the technology be adapted to higher or lower capacities? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If "Yes": (i) What is the capacity of the smallest commercially viable facility: 52 units [‡] per year (ii) What is the capacity of the largest commercially viable facility: 100 units [‡] per year Does the adaptation will cause additional costs? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If "Yes" specify the increase in costs for the adaptation (%) of the initial costs: (i) For smaller plants: % For larger plants: % [‡] Please specify the unit: one transformer containing 2,5 tonne PCB		

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

1

Facility Name: "PCB-containing electrical equipment decontamination and thermal PCB destruction Facility"

Address: Leningrad Oblast, Vsevolozhskiy region, Kuzmolovskiy village, Experimental Site RSC "Applied Chemistry", "EnergoChemtech" CJSC

City/Town: Kuzmolovskiy village

P.O. Box: 188663

District/State: Leningrad Area

Country: Russian Federation

Telephone: +7 812 238-9947

Fax: +7 812 336-2307

Email: energochemtech@sovintel.ru

Web site:

Person completing form

Name: Evgeniy Gusarov

Position: General Director

Parent Company (*if different*)

Address:

City/Town:

P.O. Box:

District/State:

Country:

Telephone:

Fax:

Email:

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