



**Country Waste Profile Report for  
CROATIA  
Reporting Year: 2008**

*For guidance on reading Country Waste Profile Reports,  
please refer to the following internet based document:*

*<http://www-newmdb.iaea.org/help/profiles9/guide.pdf>*

*For further information, please contact the Responsible Officer via e-mail:  
NEWMDB@IAEA.org*

## Waste Classification Schemes

Country: CROATIA

Reporting Year: 2008

Waste Class Matrix: **IAEA Def.**

This country does use the IAEA Scheme: No

Description: The Agency's standard matrix

Waste Class Name	Distribution %		
	LILW-SL	LILW-LL	HLW
LILW-SL	100.0	0.0	0.0
LILW-LL	0.0	100.0	0.0
HLW	0.0	0.0	100.0

Waste Class Matrix: **National**

Yes

Description: A new national classification matrix derived from the classification schema defined by the new "Regulation on radioactive waste management" (draft)

Waste Class Name	Distribution %			
	VLLW	LLW	ILW	HLW
LILW-SL	0.0	100.0	0.0	0.0
LILW-LL	0.0	0.0	100.0	0.0
HLW	0.0	0.0	0.0	100.0

**Definition of «unprocessed waste» and «processed waste»:**

This country uses the IAEA standard definition:

	as-generated waste	processed for handling	processed for storage	processed for disposal
Jnprocessed means:	x			
Processed means:		x	x	x

## Groups Overview

Country: CROATIA

Reporting Year: 2008

<b>Reporting Group:</b>	<b>IMI</b>			
Inventory Reporting Date:	December 2008			
Waste Matrix Used:	National			
Description:	Institute for Medical Research and Occupational Health (MI) is a national institute dedicated to occupational health. It was the first institution that started with activities related to radiation protection. As a product of those activities, there is a (now closed) storage of disused sealed sources. For more information see: <a href="http://www.imi.hr">www.imi.hr</a>			
Site Name	Facility Name	Facilities Defined		
IMI	SRM		storage	

<b>Reporting Group:</b>	<b>IRB</b>			
Inventory Reporting Date:	December 2008			
Waste Matrix Used:	National			
Description:	Institute Rudjer Boskovic (IRB) is the largest Croatian research centre in sciences and science applications. It is a national institution dedicated to research, higher education, support to the academic community, state and local governments and technology-based industry. For more information see: <a href="http://www.irb.hr">www.irb.hr</a>			
Site Name	Facility Name	Facilities Defined		
IRB	TSRM		storage	

**Site (Structure) : IMI**

Country: CROATIA

Reporting Year: 2008

Full Name: Institute for Medical Research and Occupational Health

Location: Ksaverska cesta 2, P.O. Box 291  
HR-10001 ZAGREB  
CROATIA

Description:

Official Website:

License Holder(s): not licensed, decommissioned

Waste management facilities that are located at this site:

## Site (Structure) : IMI

Country: CROATIA

Reporting Year: 2008

<b>Facility:</b>	<b>SRM</b>
<b>Description:</b>	Storage of Radioactive Material

**Storage part of facility SRM**

The following shows storage status for waste classes and SRS.

Waste Class	Actual	Planned
LILW-SL	No	No
LILW-LL	No	No
HLW	No	No

List SRS?	No
List UMMT?	No

<b>Capacity:</b>	The storage has been decommissioned.
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## Types of Storage Units

Storage Unit Name	Type Name	Year Opened	Closed?	Full?	Modular?	Contains SRS?
SRM	bunker	1959	Yes	No	No	Yes

Comment **# 9928: Storage Facility SRM**

Closed interim storage of disused radioactive sources at the Institute for medical research and Occupational Health Zagreb, Ksaverska cesta 2 (IMI) had been used for 40 years until 2000. Storage is on the northern side behind the main Institute's building. The storage is adapted ex-atomic shelter built during 1950's consisting of several underground corridors and rooms. IMI from 1959 render services in radiation protection. Until 1990 IMI was the only institution authorized to render this kind of services to all users in Croatia. These services also included consultancy related to and handing over of disused radioactive sources from the users when they asked for such service. Over the years many disused radioactive sources were transferred to IMI and placed into the IMI storage. The sources originate from lightning rods, smoke detectors, medical equipment and industrial gauges. The entrance is behind the main building. A locked metal door controls access. The reception desk located at the entrance of the IMI main building is permanently staffed and keys are kept there.

Before the remediation 2006, there was no intrusion detection, water was observed on the floor and there was no formal and accurate inventory. Radiation could be detected outside the closed door.

Within the timeframe June 06th to 30th 2006, Ekoteh Dosimetry Co. Radiation Protection, Zagreb, Vladimira Ruzdjaka 21, organised and performed works according to the "Plan and Program of Conditioning, Characterisation, Segregation and Packing in Lead Containers of Spent Radioactive Sources from the Temporary Storage Facility of the 'IMI', Zagreb, Ksaver 2", submitted on June 2nd 2006 to the SORP, as ordered by the IAEA according to the contract No. 2006-0469-150 from March 30th 2006.

## Site (Structure) : IRB

Country: CROATIA

Reporting Year: 2008

Full Name: Institute Rudjer Boskovic

Location: Bijenicka cesta 54, P.O.Box 180  
HR-10002 ZAGREB  
CROATIA

Description:

Official Website:

License Holder(s): Institute Rudjer Boskovic

Waste management facilities that are located at this site:

<b>Facility:</b>	<b>TSRM</b>					
<b>Description:</b>	Storage of Radioactive Material					
<b>Storage part of facility</b>						
<b>TSRM</b>						
The following shows storage status for waste classes and SRS.						
<b>Waste Class</b>	<b>Actual</b>	<b>Planned</b>				
LILW-SL	Yes	Yes				
LILW-LL	Yes	Yes				
HLW	No	No				
<b>List SRS?</b>	Yes					
<b>List UMMT?</b>	No					
<b>Capacity:</b>	Capacity is about 20 years at the current rate of usage					
<b>Types of Storage Units</b>						
<b>Storage Unit Name</b>	<b>Type Name</b>	<b>Year Opened</b>	<b>Closed?</b>	<b>Full?</b>	<b>Modular?</b>	<b>Contains SRS?</b>
TSRM	building	1967	No	No	Yes	Yes

## Site (Data) : IRB

Stock of waste as at December 2008

Country: CROATIA

Reporting Year: 2008

Site Name: IRB

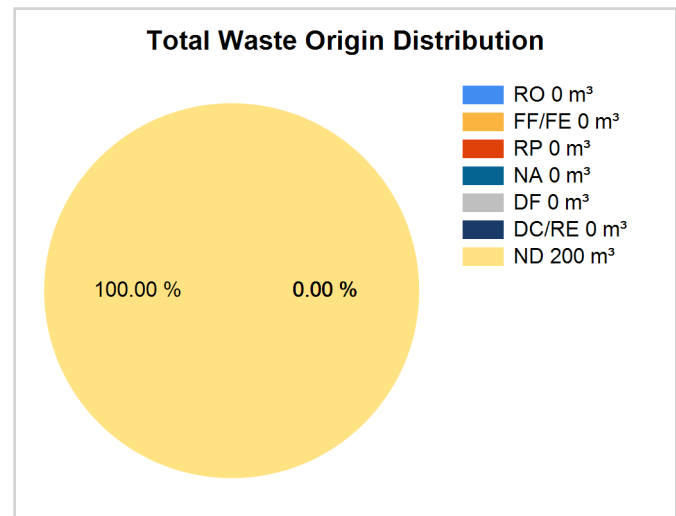
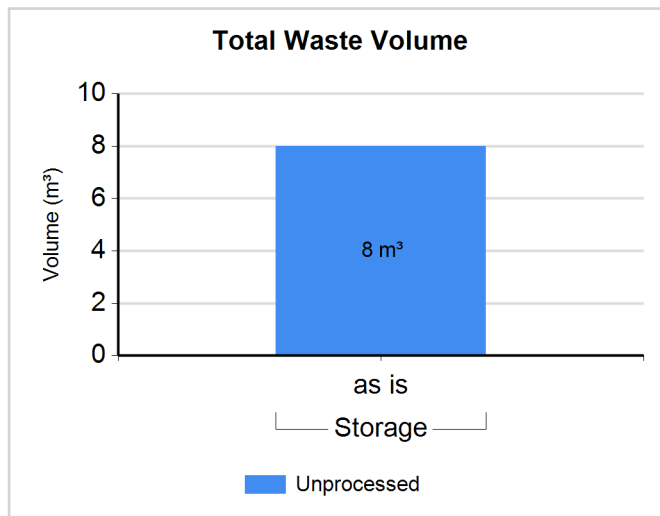
Full Name: Institute Rudjer Boskovic

Inventory Reporting Date: December 2008

Waste Matrix Used: National

## Waste Inventory

Est=distribution is an estimate, Proc.=Is the waste processed (Yes/No)? RO=Reactor Operations, FF/FE=Fuel Fabrication/Fuel Enrichment, RP=Reprocessing, NA=Nuclear Applications,DF=Defence, DC/RE=Decommissioning/Remediation, ND=Not Determined



Note: where volume "as dispo" is provided, volume "as is" is used in the graph instead.

## Waste Class: LILW-SL

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
LILW-SL	Storage	N	N	4.000	4.000	0.00	0.00	0.00	0.00	0.00	0.00	100.00

## Waste Class: LILW-LL

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
LILW-LL	Storage	N	N	4.000	4.000	0.00	0.00	0.00	0.00	0.00	0.00	100.00

## Spent Sources &lt;=30 years in Storage

Nuclide	Number of Sources/Total Activity of Sources (GBq)			c	o	n	c	a	t	Total Activity for all Groups (GBq)	Decay Date
	Group I less than or equal 4GBq	Group II more than 4GBq but less than or equal 4E+4GBq	Group III more than 4E+4GBq								
	num/activity	num/activity	num/activity								
Cd-109	3			Y	N	Y				5.700E-002	
	5.700E-002										
Co-57	1			Y	N	Y				8.400E-003	
	8.400E-003										

## Site (Data) : IRB

Stock of waste as at December 2008

Country: CROATIA

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Co-60		1		Y	N	Y	1.500E+004	
		1.500E+004						
Co-60		1		Y	N	Y	5.700E+001	
		5.700E+001						
Co-60	21	1		Y	N	Y	3.020E+001	
	2.500E+001	5.200E+000						
Co-60	101			Y	N	Y	5.000E+000	
	5.000E+000							
Cs-137	56	12		Y	N	Y	2.700E+002	
	1.100E+002	1.600E+002						
Cs-137	162			Y	N	Y	1.900E+001	
	1.900E+001							
Eu-152	125	57		Y	N	Y	6.500E+002	
	3.800E+002	2.700E+002						
Eu-152	2			Y	N	Y	1.200E-002	
	1.200E-002							
Fe-55	8			Y	N	Y	1.300E+000	
	1.300E+000							
H-3		2		Y	N	Y	1.200E+001	
		1.200E+001						
Ir-192	225			Y	N	Y	2.300E+001	
	2.300E+001							
Ir-192	4	18		Y	N	Y	3.665E+002	
	6.500E+000	3.600E+002						
Ir-192		1		Y	N	Y	9.500E+001	
		9.500E+001						
Kr-85	5			Y	N	Y	8.800E+000	
	8.800E+000							
Ru-106	11			Y	N	Y	2.100E-002	
	2.100E-002							



## Site (Data) : IRB

Stock of waste as at December 2008

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Sr-90	30	1		Y	N	Y	1.670E+001	
	1.100E+001	5.700E+000						
Tl-204	5			Y	N	Y	3.800E-003	
	3.800E-003							

## Spent Sources &gt; 30 years in Storage

Nuclide	Number of Sources/Total Activity of Sources (GBq)		c	u	c	Total Activity for all Groups (GBq)	Decay Date
	Group I less than or equal 2 GBq	Group II more than 2GBq					
	num/activity	num/activity					
Am-241	1	5	Y	N	Y	6.410E+001	
	1.100E+000	6.300E+001					
Am-241	14250		Y	N	Y	1.300E+001	
	1.300E+001						
Am-241	6	11	Y	N	Y	8.200E+001	
	1.000E+001	7.200E+001					
Am-241		2	Y	N	Y	2.200E+002	
		2.200E+002					
Ni-63	3		Y	N	Y	1.100E+000	
	1.100E+000						
Ra-226	1	1	Y	N	N	7.437E+001	
	3.700E-001	7.400E+001					
Ra-226	8	1	Y	N	Y	9.300E+000	
	7.000E+000	2.300E+000					
Ra-226	698		Y	N	Y	5.100E+001	
	5.100E+001						

## Regulators

Country: CROATIA

Reporting Year: 2008

<b>Name:</b>	<b>MH</b>
Full Name:	Ministry of Health and Social Welfare
Divison:	Sanitary Inspection Department
City or Town:	Zagreb
Main Website:	

<b>Name:</b>	<b>SORP</b>
Full Name:	State Office for Radiation Protection
Divison:	
City or Town:	Zagreb
Main Website:	

<b>Name:</b>	<b>SONS</b>
Full Name:	State Office for Nuclear Safety
Divison:	
City or Town:	Zagreb
Main Website:	

## Regulations / Laws

Country: CROATIA

Reporting Year: 2008

<b>Name:</b>	<b>STRUCTURE</b>	
Title or Name:	Act on the Structure and Scope of Ministries and State Administration Organisations	
Reference Number:	Off. Gazette 199/03,30/04,44/06	
Date Promulgated or Proclaimed:	4/4/2006	Law

<b>Name:</b>	<b>RAD. PROT.</b>	
Title or Name:	Act on Ionising Radiation Protection and Safety of Ionising Radiation Sources	
Reference Number:	Off. Gazette 64/06	
Date Promulgated or Proclaimed:	5/30/2006	Law

Attachment **#1227: Regulation**

ACT-RPROT.pdf

ACT ON IONISING RADIATION PROTECTION AND SAFETY OF IONISING RADIATION SOURCES (Off. gazette . 64/2006)

<b>Name:</b>	<b>WASTE M.</b>	
Title or Name:	Regulation on Procedures for Collecting, Accounting, Treatment, Final Disposal and Release of Radioactive Waste Materials into Human Environment	
Reference Number:	Off. Gazette 62/1986, 53/1991	
Date Promulgated or Proclaimed:	6/28/1991	Regulation

Attachment **#1603: Regulation**

waste\_44-08.pdf

Regulation on conditions and method of disposal of radioactive waste, spent sealed radioactive sources and ionising radiation sources which are not intended for further use (Official Gazette 44/08)

<b>Name:</b>	<b>NUCL.SAF.</b>	
Title or Name:	Act on Nuclear Safety	
Reference Number:	Off. Gazette 173/03	
Date Promulgated or Proclaimed:	10/31/2003	Law

Attachment **#1605: Regulation**

ACT-NSAFETY.pdf

Act on Nuclear Safety (Official gazette 173/03)

Country: CROATIA

Reporting Year: 2008

## Policies

Country: CROATIA

Reporting Year: 2008

## National Systems

Policy		(Yes;Partially;No)
Q14	Has your Country implemented a national policy for radioactive waste management?	Yes
Attachment	#1607: Questionnaire	
	draft strategy.pdf	
	Draft Strategy for Management of Radioactive Waste and Spent Nuclear Fuel	

Strategies		(Yes;Partially;No)
Q15	Has your country developed strategies to implement a national policy?	Yes
Attachment	#1606: Questionnaire	
	draft strategy.pdf	
	Draft Strategy for Management of Radioactive Waste and Spent Nuclear Fuel	

Requirements		(Yes;Partially;No)
Q17	identified the parties involved in the different steps of radioactive waste management	Yes
Q18	specified a rational set of safety, radiological and environmental protection objectives	Yes
Q19	implemented a mechanism to identify existing and anticipated radioactive wastes	Yes
Q20	implemented controls over radioactive waste generation	Yes
Q21	identified available methods and facilities to process, store and dispose of radioactive waste on an appropriate time-scale	Partially
Q22	taken into account interdependencies among all steps in radioactive waste generation and management	Partially
Q23	implemented appropriate research and development to support the operational and regulatory needs	Partially
Q24	implemented a funding structure and the allocation of resources that are essential for radioactive waste management	No
Q25	implemented formal mechanisms for disseminating information to the public and for public consultation	No

## Policies

Country: CROATIA

Reporting Year: 2008

<b>Responsibilities</b>		<b>(Complete;Incomplete)</b>
Q28	establish and implement a legal framework for the management of radioactive waste	Complete
Q29	establish or designate a regulatory body that has the responsibility for carrying out the regulatory function with regard to safety and the protection of human health and the environment.	Complete
Q30	define the responsibilities of waste generators and operators of waste management facilities	Complete
Q31	provide for adequate resources	Incomplete
Q33	enforce compliance with regulatory requirements	Complete
Q34	implement the licensing process	Complete
Q35	advise the government	Complete
Q37	identify an acceptable destination for the radioactive waste	Complete
Q114	comply with legal requirements	Incomplete
<b>Activities</b>		<b>(Yes;Partially;No)</b>
Q43	perform safety and environmental impact assessments for radioactive waste management facilities	Yes
Q44	ensure adequate radiation protection for workers, the general public and the environment	Yes
Q45	ensure suitable staff, equipment, facilities, training and operating procedures are available to perform the safe radioactive waste management steps	Partially
Q46	establish and implement a quality assurance programme for the radioactive waste generated or its processing, storage and disposal	No
Q47	establish and keep records of appropriate information regarding the generation, processing, storage and disposal of radioactive waste, including an inventory of radioactive waste	Yes
Q48	provide surveillance and control of activities involving radioactive waste as required by the regulatory body	Yes
Q49	collect, analyze and, as appropriate, share operational experience to ensure continued safety improvements in radioactive waste management	Partially
Q50	conduct or otherwise ensure appropriate research and development to support operational needs in radioactive waste management	Partially
<b>Clearance</b>		<b>(Yes;No)</b>
Q128	Does your country have "clearly defined clearance levels based on radiological criteria, with policy statements that material below those levels can be recycled or disposed of with non-radioactive wastes"?	Yes
Q129	Has your country ever used a "case-by-case" approach to clearing radioactive wastes (excluding spent/disused sealed radioactive sources)?	No
Q130	Has your country ever used clearance levels to dispose of, reuse or recycle radioactive waste as non-radioactive waste or as a non-radioactive resource (excluding spent/disused sealed radioactive sources)?	No

## Policies

Country: CROATIA

Reporting Year: 2008

## Disposal Facilities

Licensing		(Yes - All;Yes - Some;No)
Q53	Environmental Assessment (EA)	No
Q54	Environmental Impact Statement (EIS)	No
Q55	Performance Assessment (PA)	No
Q56	Quality Assurance (QA)	No
Q57	Safety Assessment (SA)	No
Operation		(Yes - All;Yes - Some;No)
Q60	Does your Country have formal, documented waste acceptance criteria for its operating or proposed disposal facilities?	No
Post-Closure		(Yes;No)
Q61	Does your Country have any written policies to address the maintenance of records that describe the design, location and inventory of waste disposal facilities?	No
Q63	Does your Country have any written policies to address active institutional controls or passive institutional controls, such as monitoring or access restrictions?	No

## Policies

Country: CROATIA

Reporting Year: 2008

**Processing/Storage**

<b>Policies/Procedures</b>		<b>(Yes;No)</b>
Q73	waste sorting/segregation	No
Q74	waste minimization	No
Q75	waste storage	No
Q76	processing and/or storing and/or disposing of nuclear fuel cycle waste separately from non-nuclear fuel cycle waste (also known as nuclear applications waste)	No
Q78	Does your country have any legislation, regulation, or policy that waste processing must take place prior to storage (see following note)	No
<b>Implementation</b>		<b>(Yes;No)</b>
Q80	In your Country are there any waste processing facilities at the same location where the waste is generated?	No
Q81	In your Country are there any centralized waste processing facilities?	No
Q82	In your Country are there any mobile waste processing facilities?	No
<b>Foreign</b>		<b>(Yes;No)</b>
Q121	Has your country sent any wastes or spent fuel to another country for processing (reprocessing for fuel)?	No
Q124	Has your country accepted any wastes or spent fuel from another country for processing (reprocessing for fuel)?	No



## Policies

Country: CROATIA

Reporting Year: 2008

## Spent/Disused SRS

Registration		(Yes;No)
Q84	Is there a national level registry?	Yes
Q85	If answer was yes, is the registry used only for disused/spent SRS?	Yes
Q87	Are there regional-level registries (one or more)?	No
Q90	Are there local-level registries (one or more)?	No
Procedures		(Yes;No)
Q91	Does your Country have documented procedures in place to ensure that sealed radioactive sources (SRS) are transferred to secure facilities in a timely manner after their user declares them to be spent?	No
Agreements		(Yes;No)
Q93	Government to Government agreements	No
Q94	Government - Supplier agreements	No
Q95	Supplier-User agreements	Yes
Q97	Do any agreements include suppliers that are outside of your Country?	Yes
Release / Disposal		(Yes;No)
Q99	Does your Country have any regulations to free-release spent sealed radioactive sources (SRS)?	No
Q100	Has your Country disposed of spent SRS in existing disposal facilities for LILW or HLW waste?	No
Q101	Does your Country plan to dispose of spent SRS in existing or planned disposal facilities for LILW or HLW waste?	Yes
Q102	Has your Country implemented dedicated disposal facilities for spent SRS?	No
Q103	Does your Country have plans to implement dedicated disposal facilities for spent SRS?	Yes
Import-Export		
Radioactive Waste		(Yes;No)
Q104	Does your Country have laws or Regulations restricting either the import or export of radioactive waste (excluding spent fuel)?	Yes
Spent Fuel		(Yes;No)
Q105	Does your Country have laws or Regulations restricting either the import or export of spent fuel?	Yes

Country: CROATIA

Reporting Year: 2008

**Liquid HLW****Storage****(Yes;No)**

Q106 Does your Country have high-level liquid wastes in storage? No

**UMMT****Responsibility****(Yes;No)**

Q110 Does your Country have any Uranium Mine and Mill Tailings sites that do not have a designated authority to manage them? No

**Decommissioning****Funding****(Yes - All;Yes - Some;No)**

Q111 Does your Country require that funds should be set aside in support of future waste management activities, such as decommissioning activities? No

**Facilities****(Yes;No)**

Q119 Does Your Country have any nuclear fuel cycle facilities? No

Q120 Does Your Country have any nuclear applications facilities (non fuel cycle facilities)? No

## Future Outlook

Country: CROATIA

Reporting Year: 2008

**Data not available.**

## Future Outlook

Country: CROATIA

Reporting Year: 2008

**Data not available.**

## Future Outlook

Country: CROATIA

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**Data not available.**

## Future Outlook

Country: CROATIA

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## Future Outlook

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## Future Outlook

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