OPERATION AND SAFETY REPORT OF MOCHOVCE AND BOHUNICE V2 NUCLEAR POWER PLANTS

2012

SLOVENSKÉ ELEKTRÁRNE

Enel

QMS Certificate (Quality Management System pursuant to ISO 9001:2008)
EMS Cerificate (Environmental Management System) according to ISO 14001:2004
OHSAS Certificate (Occupational Health and Safety System pursuant to OHSAS 18001:2007)
issued by
Bureau Veritas

2012 – Highlights

Bohunice V2 NPP (EBO V2)

- In some parameters, the best year in the history of EBO for the third time
- good results in the area of operation reliability
- The follow-up review of the IAEA OSART from 4 to 8 June
- Training for new members of OSART missions - reviewers for the IAEA – from 3 to 5 July
- Establishment of a new unit as of 1 September 2012 – Nuclear Training
- Reconstruction of the practical training centre took place.
- 14 July – 3 August GO of Unit 3, the outage lasted 20.82 days
- 26 May – 29 June GO of Unit 4, the outage lasted 33.98 days
- Site emergency exercise organised in cooperation with the Ministry of Interior of the Slovak Republic at the level of three regions – Trnava, Nitra and Trenčín
- 26 – 29 November Technical supporting WANO mission "Centre of Outages Management"
- 27 – 29 November Internal International Peer Review of ENEL in the area of OHS and use of personal protective equipment
- Completed investment projects:
  - Replacement of TG 41, 42control system
  - Modification and replacement of 4 impellers (Unit 3) and 2 impellers (Unit 4) of reactor coolant pumps
  - Implementation of severe accident project
  - Replacement of TG 41 main condenser pipes(3/4)
  - Modernization of information system of reactor core control system.

Mochovce NPP (EMO)

- good results in the area of operation reliability (UCF average for SE 92.27%).
- in history, the lowest production of liquid radioactive wastes
- the collective effective dose kept within the world best values in the area
- Establishment of a new unit as of 1 September 2012 – Nuclear Training
- Reconstruction of the full-scope simulator for the training of main control room operative technical staff and inspection physicist took place.
- 14 April – 7 May GO of Unit 1, the outage lasted 23.2 days
- 20 October – 13 November GO of Unit 2, the outage lasted 24.9 days
- executed parts of investment projects:
  - for severe accidents "Installation of siphon trap and reactor shaft flooding" and "Hydrogen management in the hermetic zone",
  - replacement of 39 components on steam pipelines of both TGs
  - executed repair of the input pipeline of diesel oil and pipeline of pump suction for cooling of cylinders on all three DGs (improvement of the reliability of the DG)
  - modernization of the 400kV line EMO - Veľký Ďúr
  - modernization of the fuel-charging machine

[1] World Association of Nuclear Operators

[2] 2 General overhaul

[3] OTP BD a KF – Main control room operations technical staff and inspection physicist

[4] TG – turbine generator

GENERAL DATA

	1st criticality*	Start of permanent operation
EMO 1	9. 6. 1998	29. 1. 1999
EMO 2	1. 12. 1999	11. 7. 2000
EBO 3	7. 8. 1984	14. 2. 1985
EBO 4	2. 8. 1985	18. 12. 1985

EMO – Mochovce Nuclear Power Plant (Units 1&2)

EBO V2 – Bohunice V2 Nuclear Power Plant (Units 3&4)

* 1. MKV – First criticality

EMO	Unit 1
Probability of the reactor core damage at the full power(according to PSA - probabilistic safety assessment level1)	7,39E-6
Probability of the reactor core damage at the shutdown reactor (according to PSA)	7,34E-6

EBO V2	Unit 3	Unit 4
Probability of the reactor core damage at the full power(according to PSA - probabilistic safety assessment)	4,06E-06	3,94E-06
Probability of the reactor core damage at the shutdown reactor (according to PSA)	6,23E-06	2,979E-06

BASIC TECHNICAL DATA

Reactor type:	VVER 440/V-213 – Pressurized water reactor / PWR
Reactor thermal power:	1 471 MWt
Reactor rated power:	470 MWe (EMO) / 505 MWe (EBO V2)
In-house consumption:	~7,2 % (EMO) / ~6,8 % (EBO V2)
Fuel:	UO_2 (42 t)
Fuel enrichment:	4,87 % U^{235}

NSSS	
Number of cooling loops:	6
Coolant flowrate:	42 600 m^3/h
Total volume:	242 m^3
Working pressure and temperature:	12,26 MPa / 267,9 °C – 297,3 °C

Reactor pressure vessel	
Inner diameter:	3 542 mm
Wall thickness:	140 + 9 mm
Height:	11 805 mm

Steam generator	6 per unit
Type:	PGV - 213
Volume of steam generated:	450 t/h
Steam pressure and temperature at outlet:	4.61 MPa / 255 °C

Turbine generator	2 per unit
Type:	ŠKODA 220 MWe (EMO)/ ŠKODA 250 MWe (EBO V2)
Number of stages:	1 VT / HP, 2 NT / LP
Rated speed:	3,000 RPM.
Generator rated power:	259 MVA (EMO) / 273 MVA (EBO V2)
Terminal voltage:	15,75 kV
Rated current:	3 x 9 500 A (EMO) / 3 x 10 007 A (EBO V2)

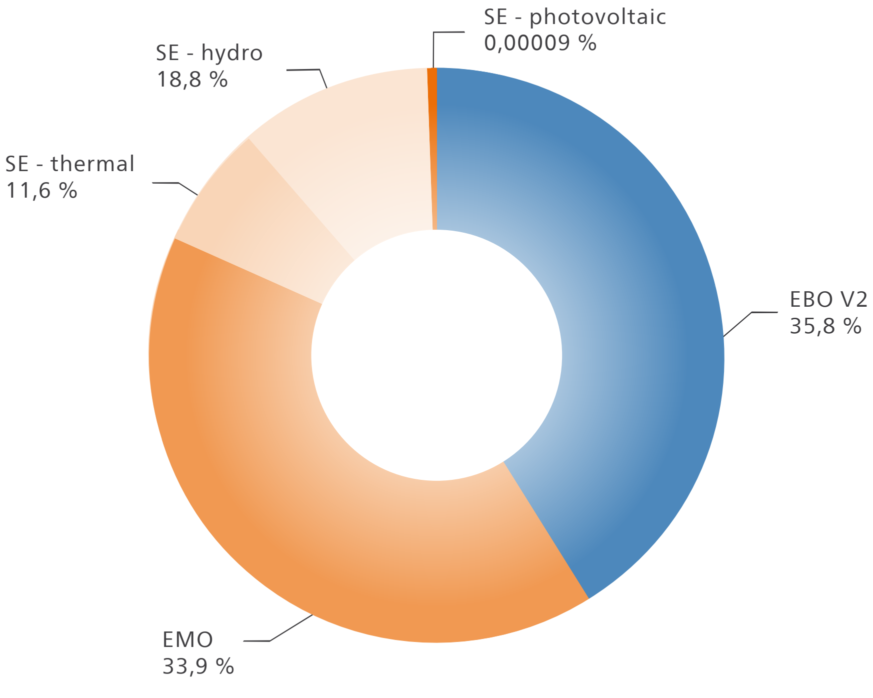
Condenser	
Cooling water volume:	35 000 m^3/h
Max. temperature of cooling water:	33°C

Cooling towers	
Number:	4 (per 2 units)
Height:	125 m (EMO) / 120 m (EBO V2)

Share in electricity generation

Share in SE total electricity generation (2012)

	MWh	%
EBO V2	7 955 583	35,76414
EMO	7 539 023	33,8915
SE - nuclear	15 494 606	69,65564
SE - thermal	2 577 898	11,58888
SE - hydro	4 171 682	18,7537
SE - photovoltaic	2 103	0,0000945
SE total	22 244 579	100
89 % of electricity generated without CO_2 emissions		



Electricity & heat generation

Basic operation indicators

Indicator	Unit		2008	2009	2010	2011	2012	Since start of operation
Gross generation	MWh	1	3 582 797	3 347 690	3 717 452	3 820 511	3 807 209	46 714 732
		2	3 308 170	3 662 899	3 426 814	3 733 587	3 731 814	41 392 251
		EMO	6 890 967	7 010 589	7 144 266	7 554 098	7 539 023	88 106 983
		3	3 296 687	3 574 656	3 653 067	3 851 256	4 045 086	85 658 177
		4	2 965 669	3 495 620	3 776 336	4 005 414	3 910 497	84 228 969
		EBO V2	6 262356	7 070 276	7 429 403	7 856 670	7 955 583	169 887 146
Net generation	MWh	1	3 321 322	3 094 034	3 446 788	3 542 880	3 532 605	43 065 504
		2	3 068 973	3 411 518	3 187 838	3 480 325	3 476 421	38 327 874
		EMO	6 390 295	6 505 552	6 634 626	7 023 205	7 009 026	81 393 378
		3	3 038 401	3 320 341	3 398 030	3 595 925	3 773 707	79 426 028
		4	2 734 861	3 252 219	3 526 718	3 745 795	3 651 241	78 223 906
		EBO V2	5 773 262	6 572 560	6 924 748	7 341 720	7 424 948	157 649 934
Heat Supply	GJ	1	74 953	180235	98 416	216 451	199 153	2 089 984
		2	136 481	37457	171 788	24 404	55 651	1 533 392
		EMO	211 434	217692	270 204	240 855	254 804	3 623 376
		3	922 497	1 019 628	1 045 268	992 108	976 617	19 554 884
		4	869 839	1 028 350	1 183 447	977 344	945 533	19 142 407
		EBO V2	1 792 336	2 047 978	2 228 715	1 969 452	1 922 150	38 697 291
Operation period	h	1	8 070	7 467	8 074	8 238	8 191	111 128
		2	7 795	8 129	7 574	8 198	8 126	99 610
		3	7 679	8 227	8 194	7 901	8 295	207 975
		4	7 254	8220	8 239	8 225	7 953	204 677
General overhaul period	Dni	1	29,0	51,5	23,3	21,6	23,2	577,8
		2	23,2	26,4	49,4	22,1	24,9	492,5
		3	45,3	37,6*	36,1*	35,79	20,36	1 405,76
		4	63,5	37,9*	35,4*	22,31	33,98	1 352,68
Gross Efficiency	%	1	32,10	32,16	33,04	32,64	32,51	32,20
		2	31,66	31,69	31,60	32,06	32,12	31,75
		EMO	31,88	31,91	32,33	32,35	32,32	31,98
		3	32,29	32,85	33,63	34,31	34,17	31,71
		4	32,14	33,31	34,23	34,48	34,56	31,72
		EBO V2	32,22	33,08	33,93	34,4	34,36	31,71

General overhauls (refuelling outages) in 2012

Unit	from	to	days
EMO 1	14. 4. 2012	7. 5. 2012	23,2
EMO 2	20. 10. 2012	13. 11. 2012	24,90
EBO 3	14. 7. 2012	3. 8. 2012	20,36
EBO 4	26. 5. 2012	29. 6. 2012	33,98

* excluding reconstruction of TG31 & TG42

HUMAN RESOURCES

Headcount

	2008	2009	2010	2011	2012
EMO	1 505	1 515	1 474	1 519	1 489
EBO V2	1 555	1 493	1 394	1 335	1 318

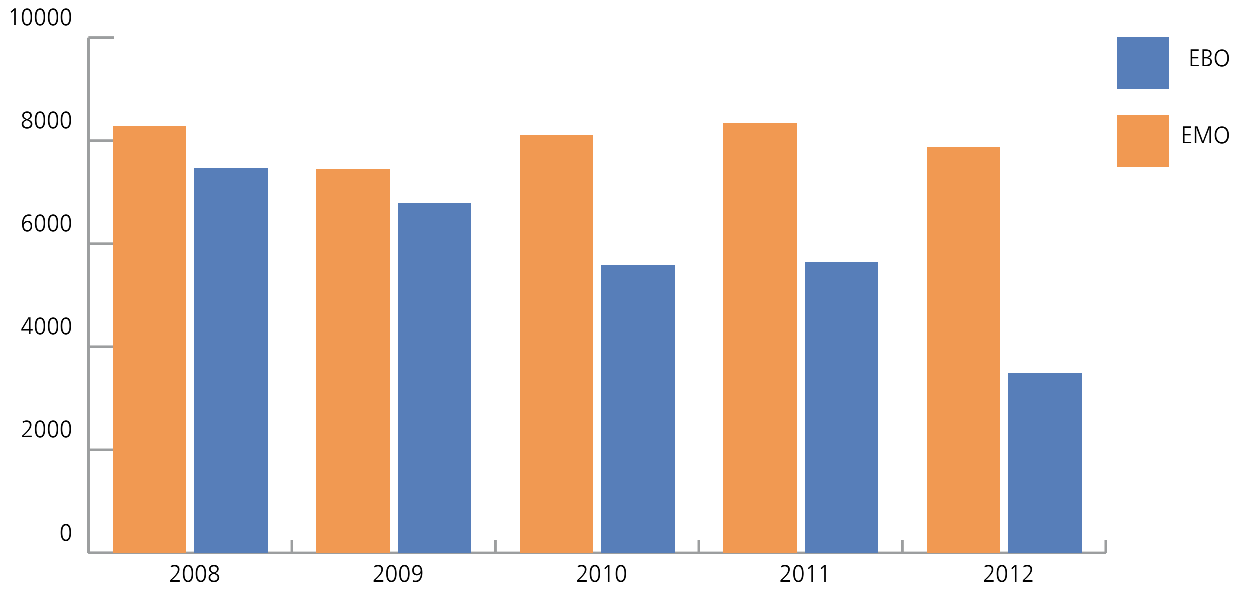
Education level of staff

	EMO	EBO V2
primary school	0	1
secondary school	917	905
university	572	412

PUBLIC RELATIONS

Number of Infocentre visitors

	2008	2009	2010	2011	2012
EMO	8 289	7 441	8 106	8 339	7 872
EBO V2	7 465	6 792	5 579	5 647	3 489



Foreword

This chapter fulfils requirements stipulated by the Atomic Act No. 541/2004, Section 10 (1) (I).

Pursuant to the Act, nuclear safety shall be understood as technical conditions and capability of a nuclear installation or transportation equipment as well as cability of their operating staff to prevent an uncontrolled release of radioactive substances or ionizing radiation into the work environment or the natural environment and the ability to avoid and mitigate consequences of events in nuclear installations or during transports of nuclear materials.

Slovenské elektrárne, a subsidiary of the Enel Group, as the holder of a license to operate nuclear installations issued by the Nuclear Regulatory Authority of the Slovak Republic (NRA SR) pursuant to Act No. 541/2004 Coll., have defined **Safety**, and in particular nuclear safety and radiation protection, in one of the main principles in its vision, as the priority permanently superior to production requests and commercial profit.

Assessment of Operational Safety of SE Nuclear Installations

Based on legislative requirements and international recommendations, Slovenské elektrárne, a subsidiary of the Enel Group, have created a unified safety assessment system applied as a managerial tool for safety management.

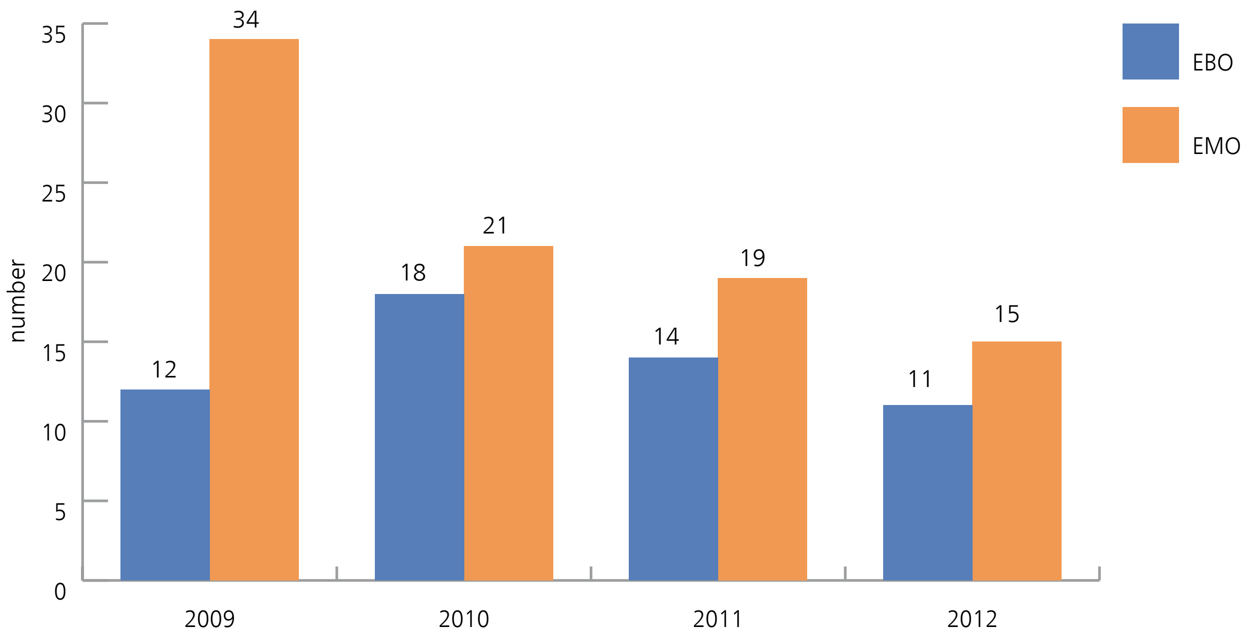
The entire safety management process is divided into multiple areas that are assessed using operational safety indicators .

Significant operational indicators and areas include:

1. OPERATING EVENTS

Nuclear installation failures described in the above Act are generally unplanned deviations from standard conditions. They are an indicator of the safety and reliability of such power plants. Various types of events have a modicum of causes and differing levels of impact on safety.

Operating events announced by SE, a. s. to NRA SR:



A total of 11 events at EBO and 15 events at EMO in the lowest category of failure were subject to NRA SR reporting. No events in the incident or accident categories were reported.

2. ASSESSMENT OF OPERATING EVENTS USING THE INES SCALE

There are seven levels for assessing the severity of an operating events in terms of its impact on nuclear safety and environmental impact contained in the IAEA guide for the assessment of OE at nuclear installations (NPP).

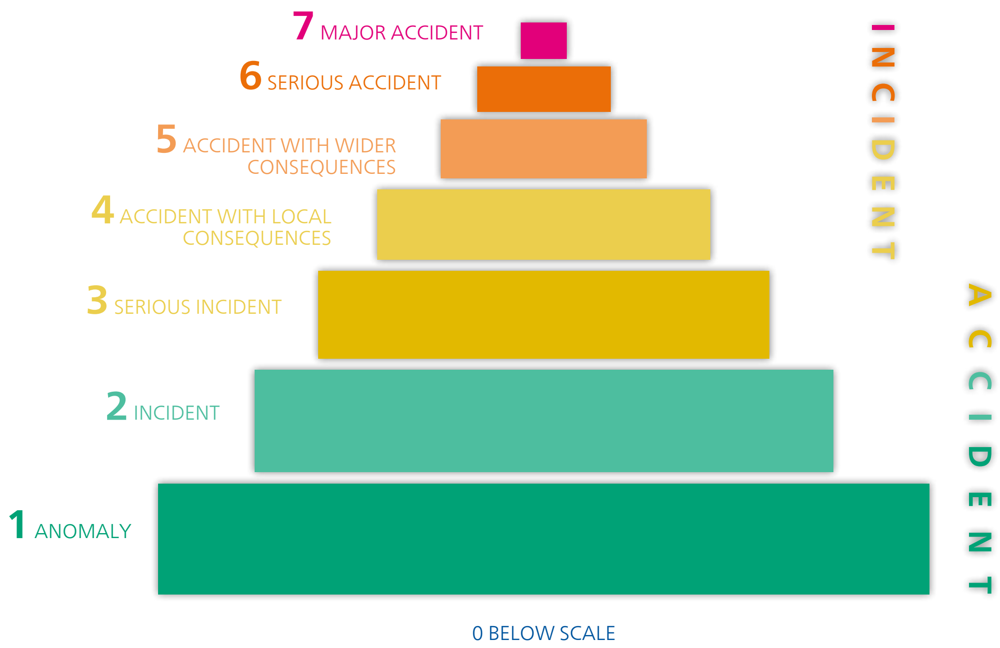
Number of INES 0 operating events (below the scale)

INES 0	2005	2006	2007	2008	2009	2010	2011	2012
EBO V2	11	12	18	11	3	15	6	3
EMO	4	9	5	5	8	5	15	10

Number of INES 1 operating events (anomaly)

INES 1	2005	2006	2007	2008	2009	2010	2011	2012
EBO V2	0	0	0	0	0	0	0	1
EMO	1	0	2	1	0	1	0	0

INES – International Nuclear Event Scale of the International Atomic Energy Agency (IAEA) (MAAE)



3. VIOLATION OF NI OPERATING LIMITS AND CONDITIONS

Limits and Conditions for NPP Operations (L&C) document approved by the NRA SR is the fundamental document for operation of nuclear installations. The operator's duty is to monitor and assess observance of the conditions stipulated in the document monitoring the level of management, organization of nuclear installation (power plant) operations and the correctness and observance of operating procedures and instructions in relation to the L&C with the goal of preventing L&C violations.

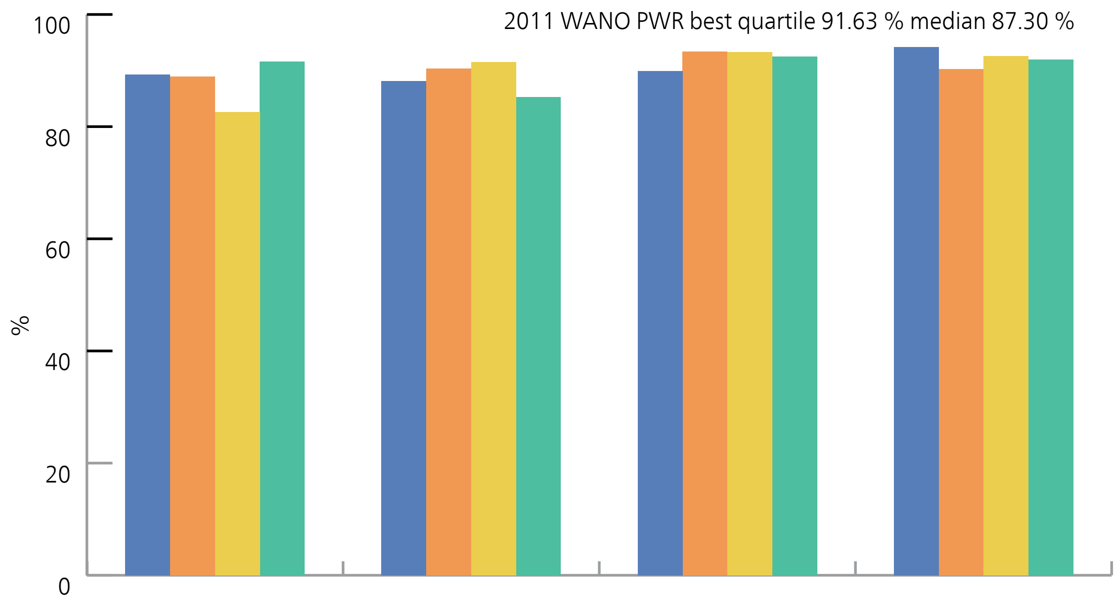
At SE-EBO, there was one case of violation of L&C, on Unit 3:
The operating personnel neglected the fulfilment of the requirements for checking the limit condition because during the planned reduction of concentration of the solution of boric acid in the spent fuel storage pool, they did not ensure continuous water sample taking. However, the fulfilment of safety functions of the power plant was not really endangered. In accordance with the Atomic Act, the event was classified as a failure and pursuant to INES scale - Degree 1.

4. NPP OPERATIONS

Slovenské elektrárne, a subsidiary of the Enel Group, as an NPP operator comprehensively assesses NPP safety and reliability using specific indicators that monitor selected areas, including WANO-defined indicators, of which it is a member. The results for individual WANO indicators:

4.1 Unit Capability Factor - UCF

Unit capability factor is a ratio of the electricity the power plant is capable of generating over a defined period of time to the reference production value expressed as a percentage with **consideration** given to limiting external factors (dispatcher-ordered generation regulation, etc.).



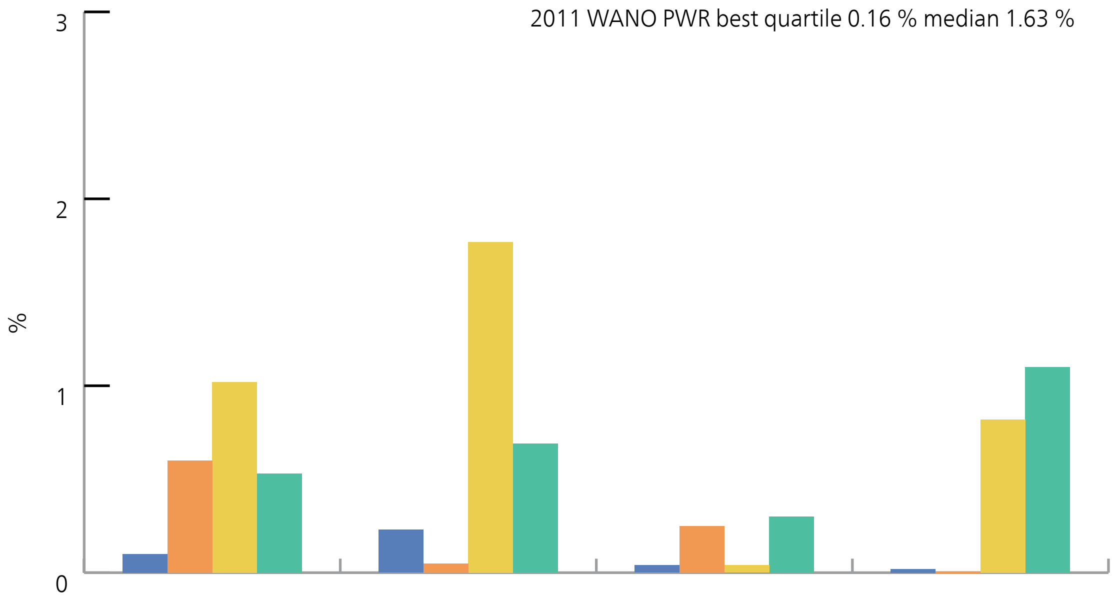
	2009	2010	2011	2012
EBO3	89,33	88,11	89,94	94,17
EBO4	88,91	90,33	93,43	90,3
EMO1	82,57	91,55	93,27	92,63
EMO2	91,61	85,27	92,50	91,96

* Median: 50 % of all monitored cases

** Quartile: 25 % of the best in the monitored quantity

4.2 Unplanned Capability Loss Factor - UCLF

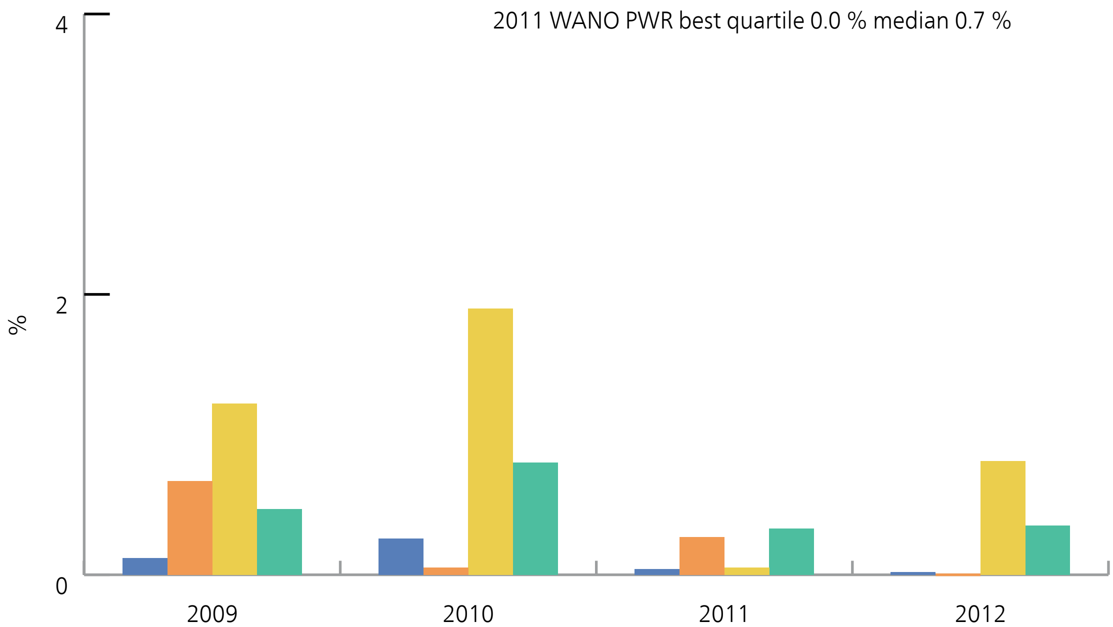
This factor monitors progress in minimizing outages and unit power reductions resulting from equipment faults and other unplanned events. The indicator is defined as the ratio of the mean value of unplanned power reductions to reference production.



	2009	2010	2011	2012
EBO3	0,1	0,23	0,04	0,02
EBO4	0,6	0,05	0,25	0
EMO1	1,02	1,77	0,04	0,82
EMO2	0,53	0,69	0,30	1,1

4.3 Forced Losses during Operation – FLR

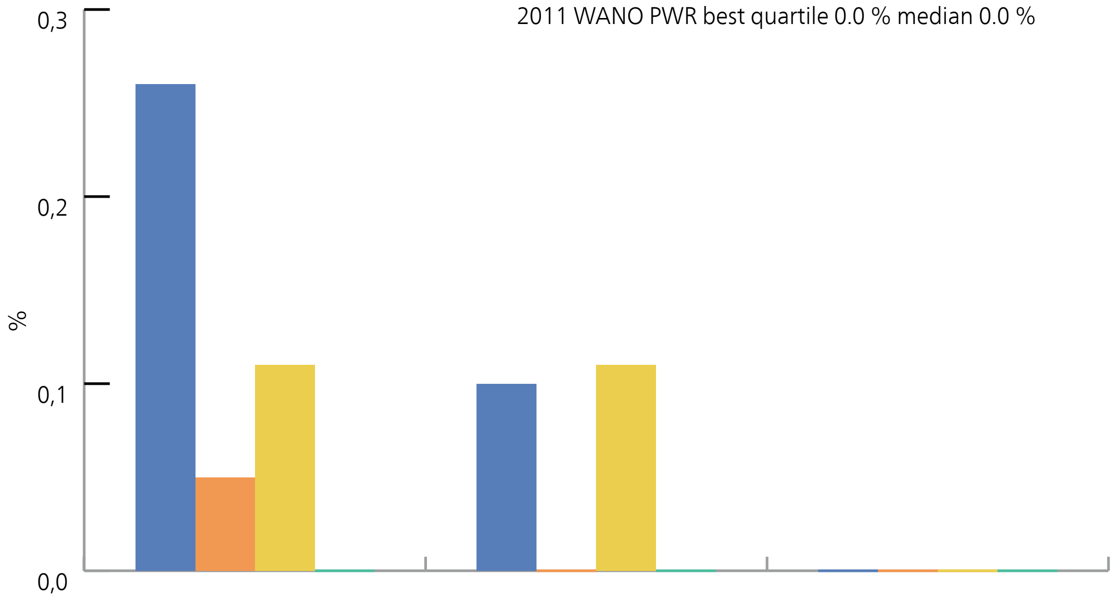
This indicator is defined as the ratio of unplanned power reductions minus production losses caused by unplanned extensions in downtime with only the operating period considered to reference production minus losses in production corresponding to planned downtime and any unplanned extensions thereof.



	2009	2010	2011	2012
EBO3	0,12	0,26	0,04	0,02
EBO4	0,67	0,05	0,27	0
EMO1	1,22	1,9	0,05	0,81
EMO2	0,47	0,80	0,33	0,35

4.4 Grid Related Loss Factor - GRLF

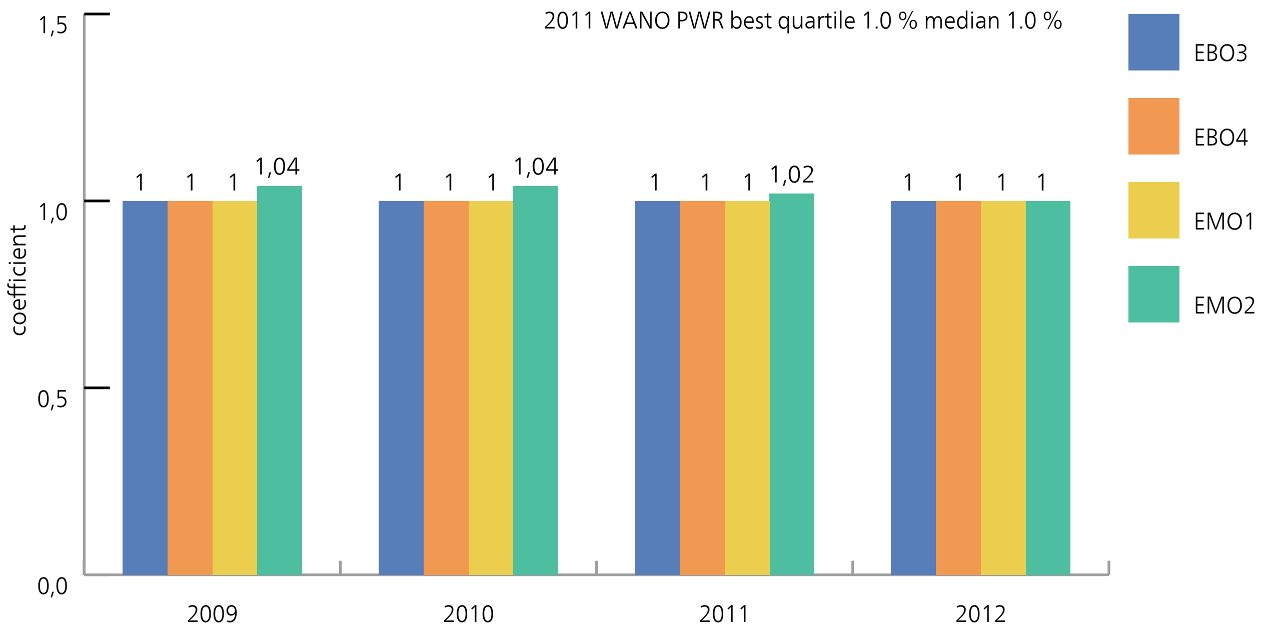
This indicator is defined as the ratio of production losses caused by grid instability or failures that the power plant is unable to control to reference production throughout the year expressed as a percentage.



	2010	2011	2012
EBO3	0,26	0,1	0
EBO4	0,05	0,0	0
EMO1	0,0	0,11	0
EMO2	0,0	0,0	0

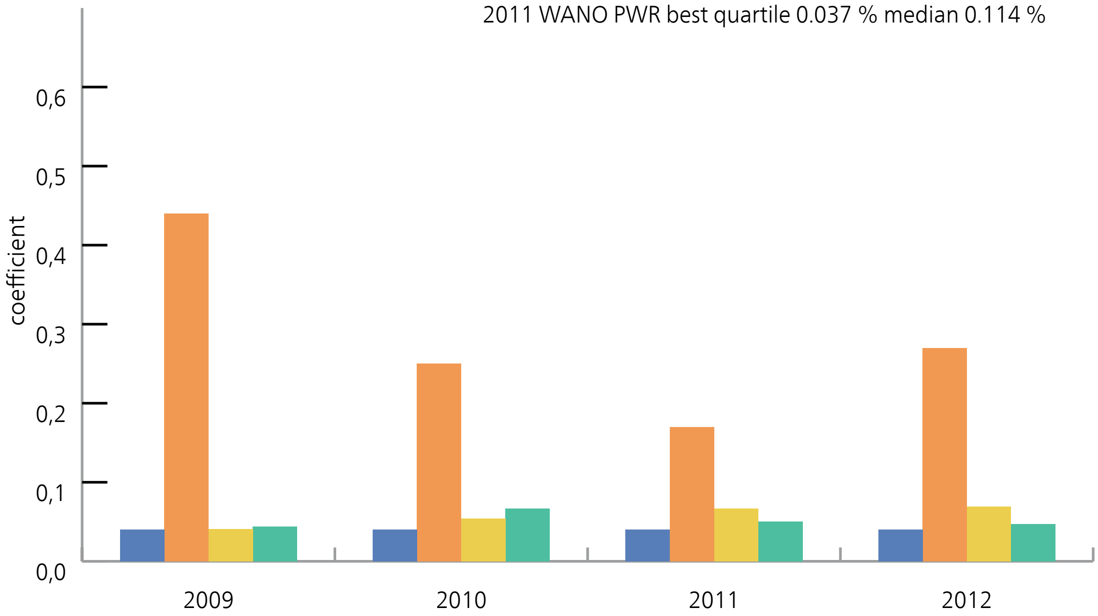
4.5 Chemical Index

This indicator assesses the efficiency of the chemical regime in steam generators. The best chemical index value that can be achieved is 1.0. The indicator compares the concentration of selected impurities with limit values. Each value is divided by the limit value and the sum of these ratios is normalized to one.



4.6 Fuel Reliability Index

This indicator monitors increases in and maintenance of high fuel tightness and is a general benchmark of fuel leakage. The indicator is defined as a balanced activity of the primary circuit given by 131I activity in kBq/l and corrected by the uranium contribution and normalized by the coolant cleaning rate.

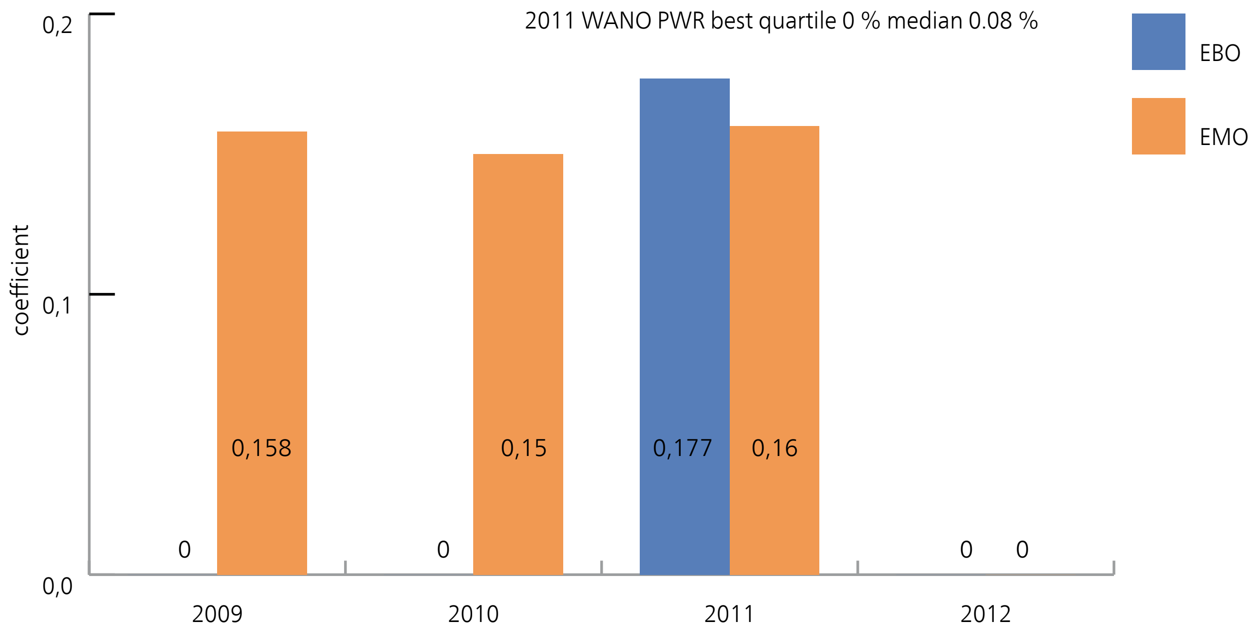


	2009	2010	2011	2012
EBO3	0,04	0,4	0,04	0,04
EBO4	0,44	0,25	0,17	0,27
EMO1	0,041	0,054	0,067	0,069
EMO2	0,044	0,091	0,05	0,047

Nuclear fuel in all four units is tight, i.e. without any leakage through the fuel rod cladding.

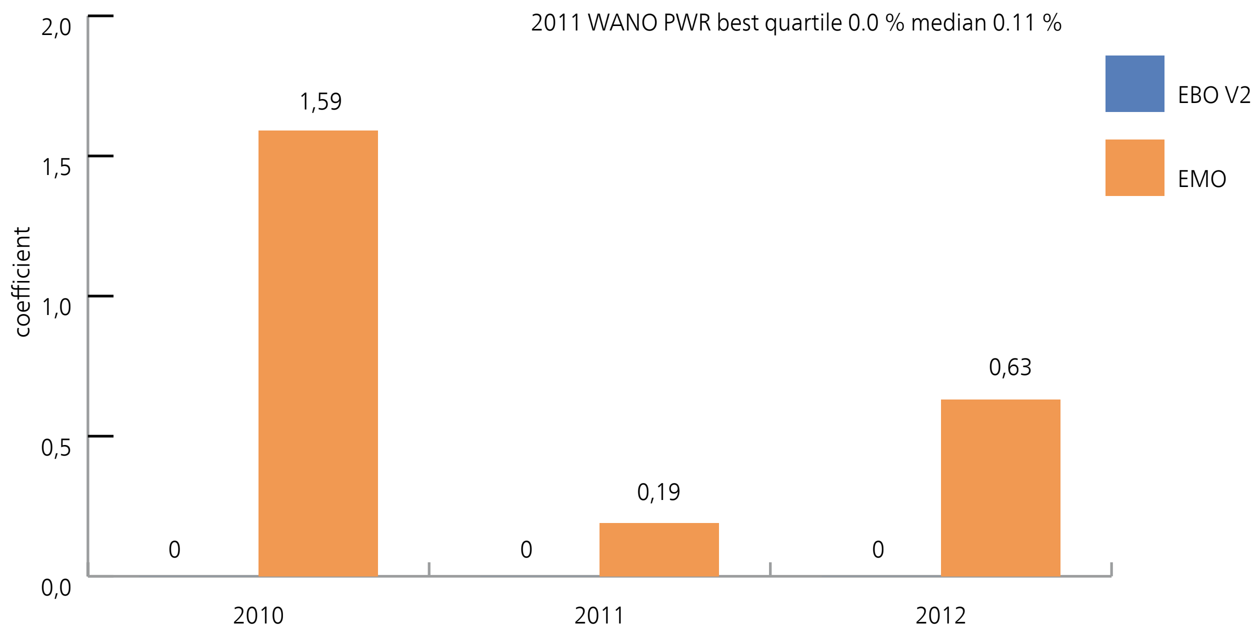
4.7 Industrial Safety Accident Rate – ISA

This indicator is defined as the number of accidents per 200,000 man-hours worked by NPP operator personnel. Contractor employees are not included in this indicator.



4.8 Contractor Industrial Safety Accident Rate – CISA

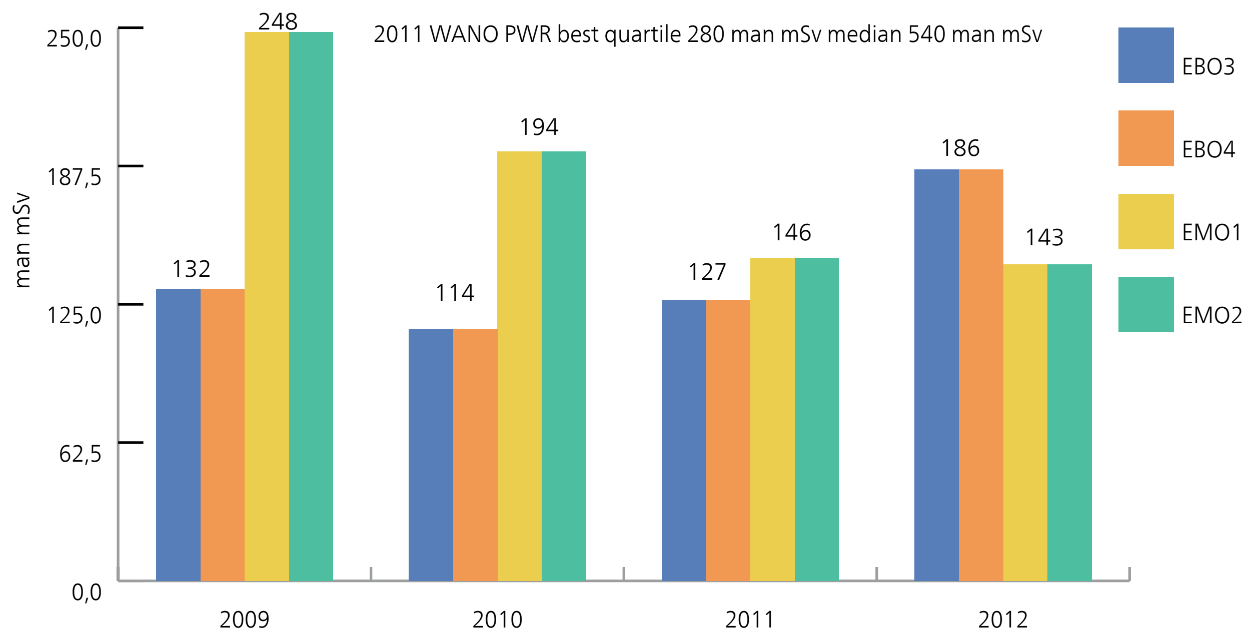
This indicator tracks the accident rate among all contractor employees, including all contractors working at the NPP resulting in lost work time of at least one or more days (except for the date on which such accident occurs) or fatalities per 200,000 man-hours worked.



Three contractor accidents resulting in an absence of more than one day were recorded at Mochovce NPP in 2012.

4.9 Collective Radiation Exposure - CRE

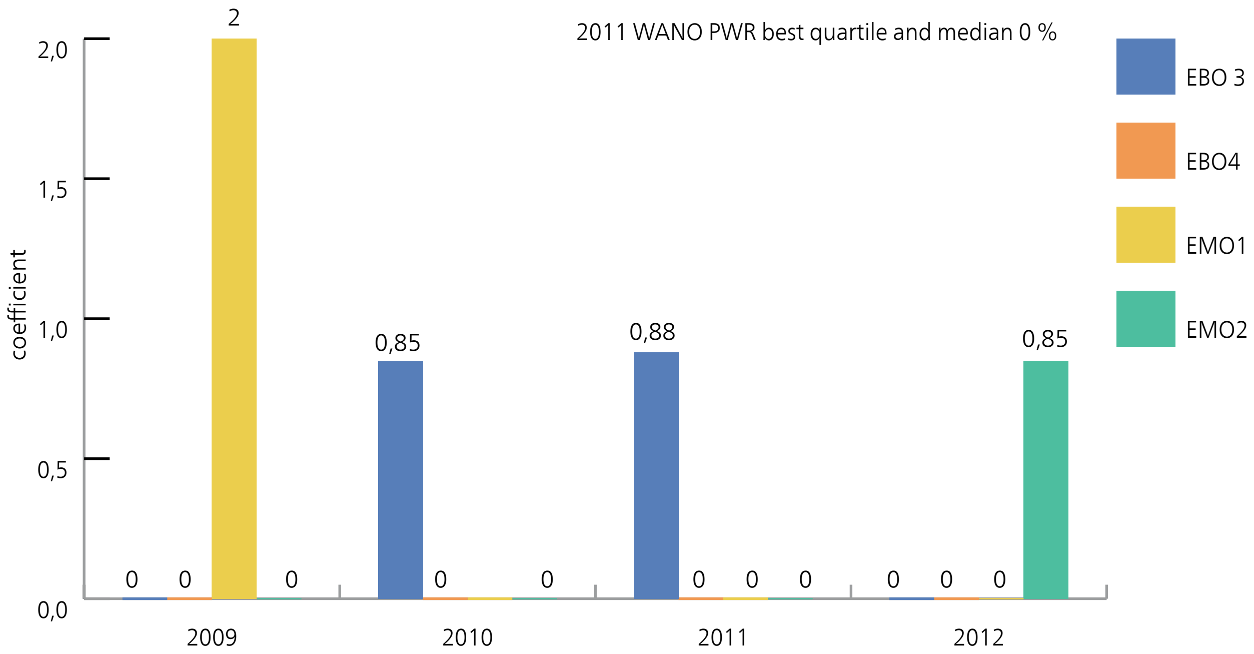
This indicator monitors the declining trend in the overall radiation exposure of both NPP and contractor personnel. This indicator is a benchmark of effective radiation protection and ALARA system application to minimize exposure.



Note: WANO values apply to the entire unit.

4.10 Unplanned Automatic Scrams per 7000 Hours Critical

This indicator expresses the number of unplanned automatic unit scrams by AO-1 per 7000 critical hours on the reactor.



In 2012, there was one automatic reactor scram on Unit 2 in Mochovce. It was not initiated by a real exceeding of some parameter, it was initiated by the signal from the reactor's instrumentation and control system issued due to technical reasons by one logic's element of reactor protections.

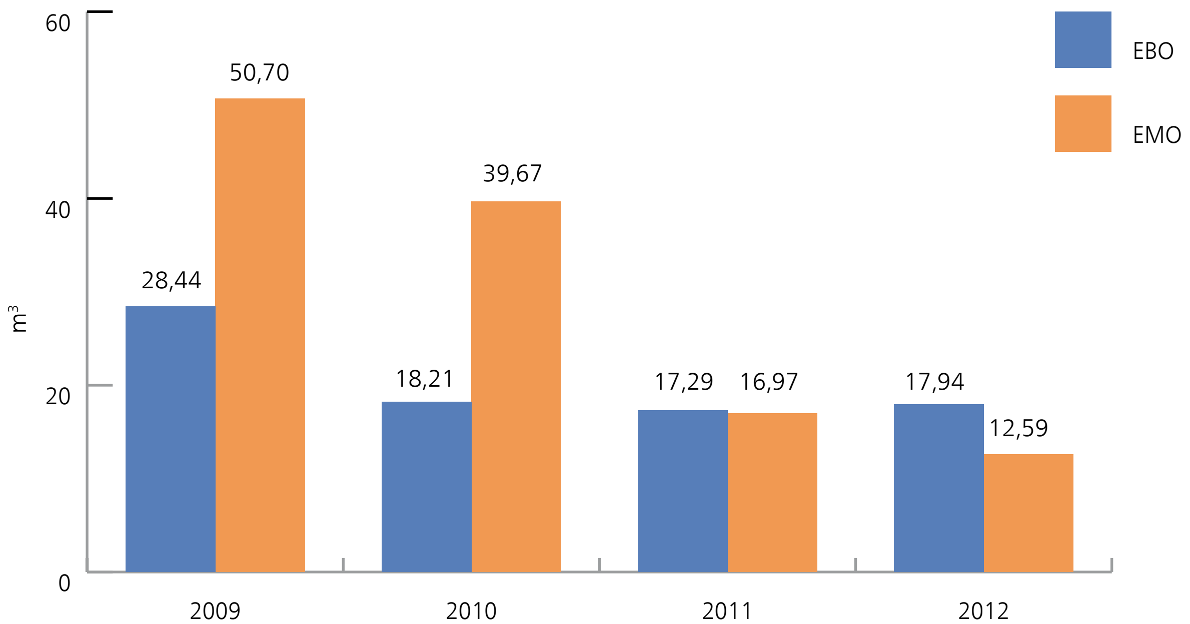
5. WASTE PRODUCTION AND RELEASES INTO THE ATMOSPHERE AND HYDROSPHERE

Minimizing the amount of both liquid and solid radioactive wastes (RAW) is the primary objective of Slovenské elektrárne, a subsidiary of the Enel Group. These indicators serve to monitor and assess the efficiency of operations at the individual units and to assess the efficacy of adopted measures to minimize RAW generation, in particular during general overhauls that involve the refuelling. Decreasing the amount of waste generated also decreases demands on waste storage, transport and permanent deposition, thereby reducing the NPP's overall footprint and environmental impact. Radioactive waste streams are monitored separately for liquid RAW and for solid RAW.

NPP operation is connected to releases of liquid and gaseous radioactive materials into the environment. The operator's objective is to minimize such emissions into the environment. The values for releases, types of substances and their limit values are defined by state regulatory bodies.

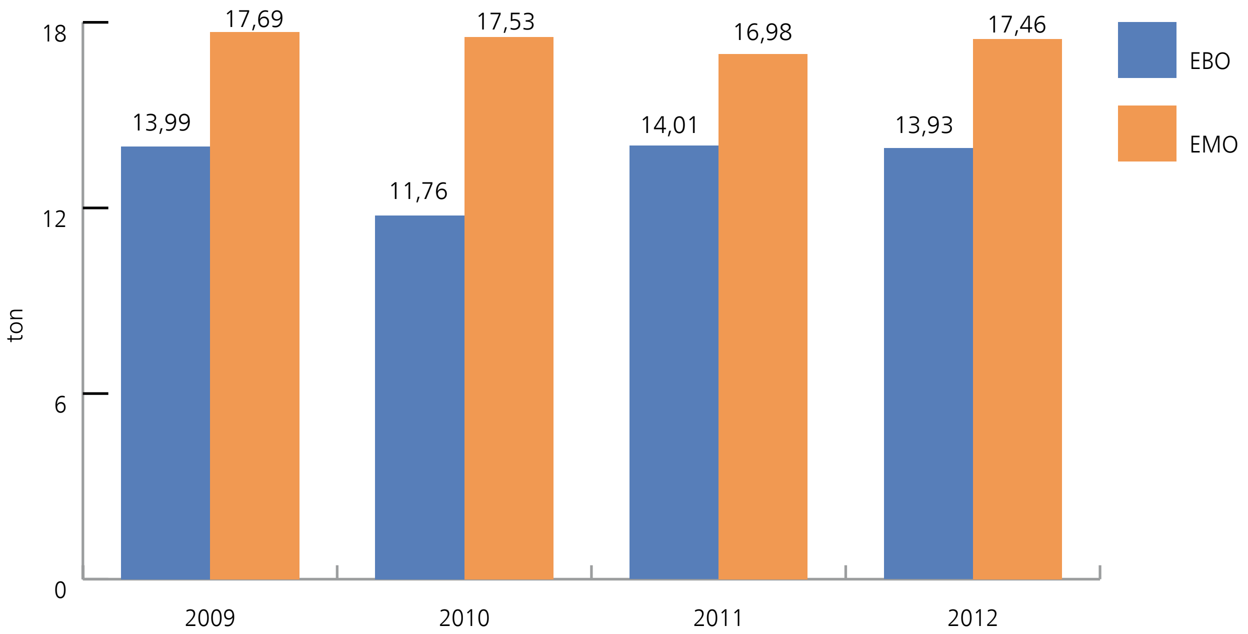
5.1 Production of Liquid Radioactive Waste (RAW)

This indicator is defined as the volume of liquid radioactive waste (RAW) in m^3 generated by nuclear installation operations and converted to boric acid contents of 120 g/kg.



5.2 Production of Solid Radioactive Waste (RAW)

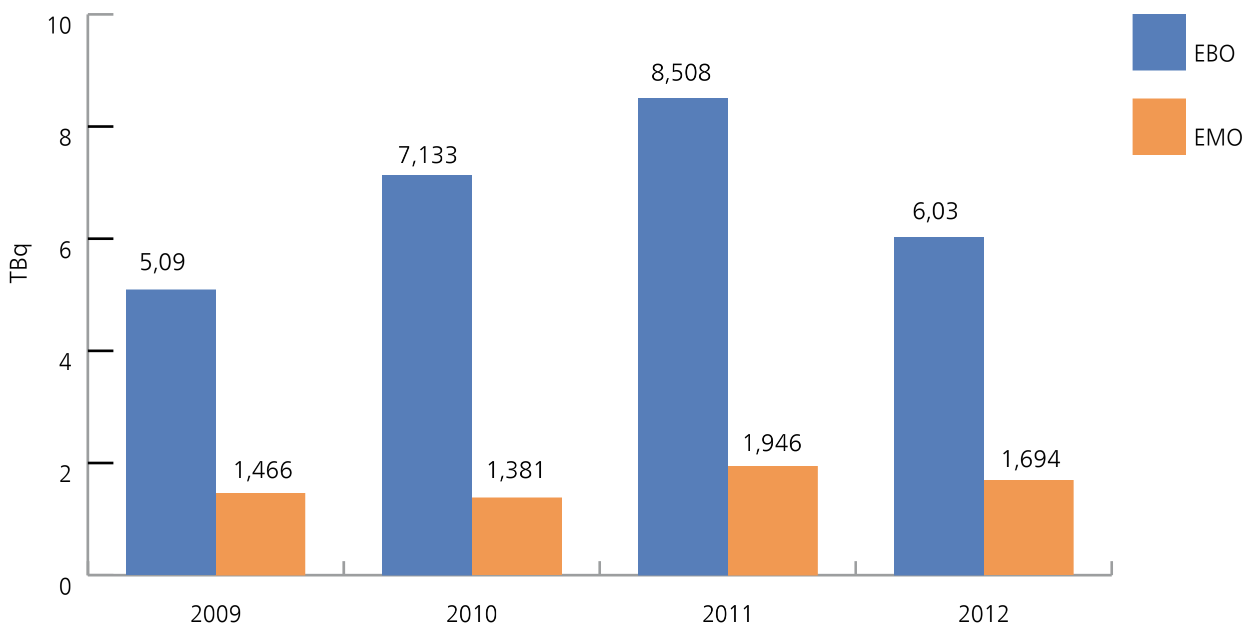
This indicator is defined as the amount of radioactive waste (RAW) in tonnes (t) generated by nuclear installation operations.



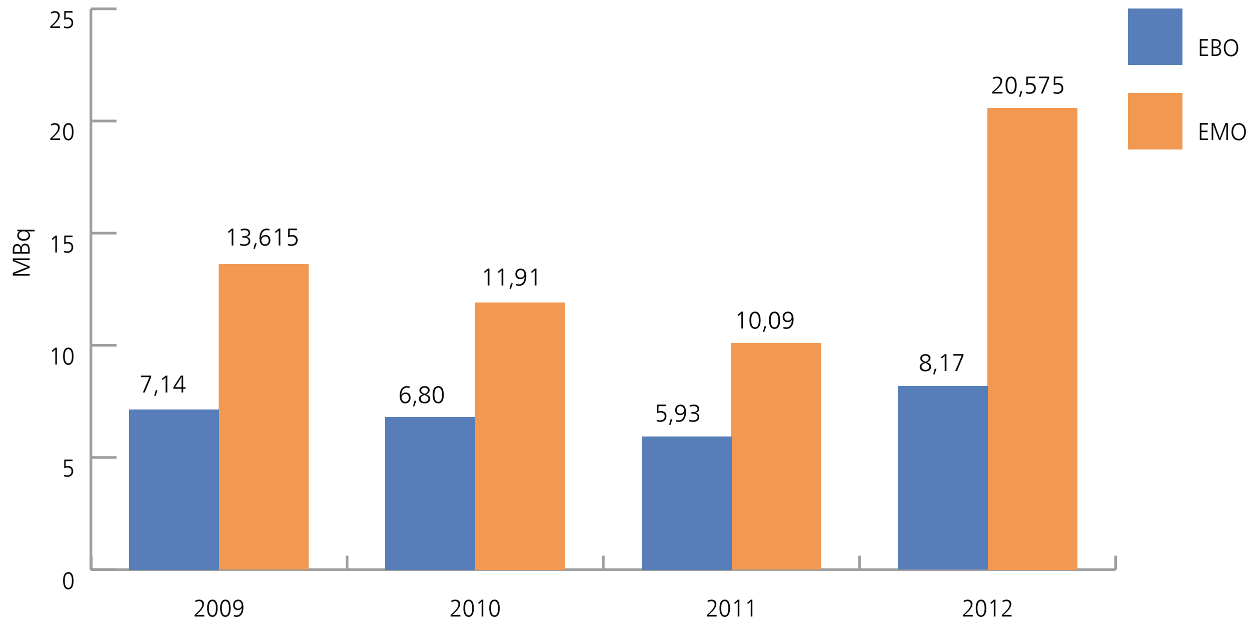
5.3 Atmosphere Releases 2012

Installation	Type of release	Activity	Unit	Share of target valuefor 2012 [%]
EBO	Nobel gases	6,030	TBq	0,301
EBO	Aerosols	8,174	MBq	0,0102
EBO	Iodine	0,383	MBq	0,000589
EMO	Nobel gases	1,694	TBq	0,041
EMO	Aerosols	20,575	MBq	0,012
EMO	Iodine	0,280	MBq	0,00042

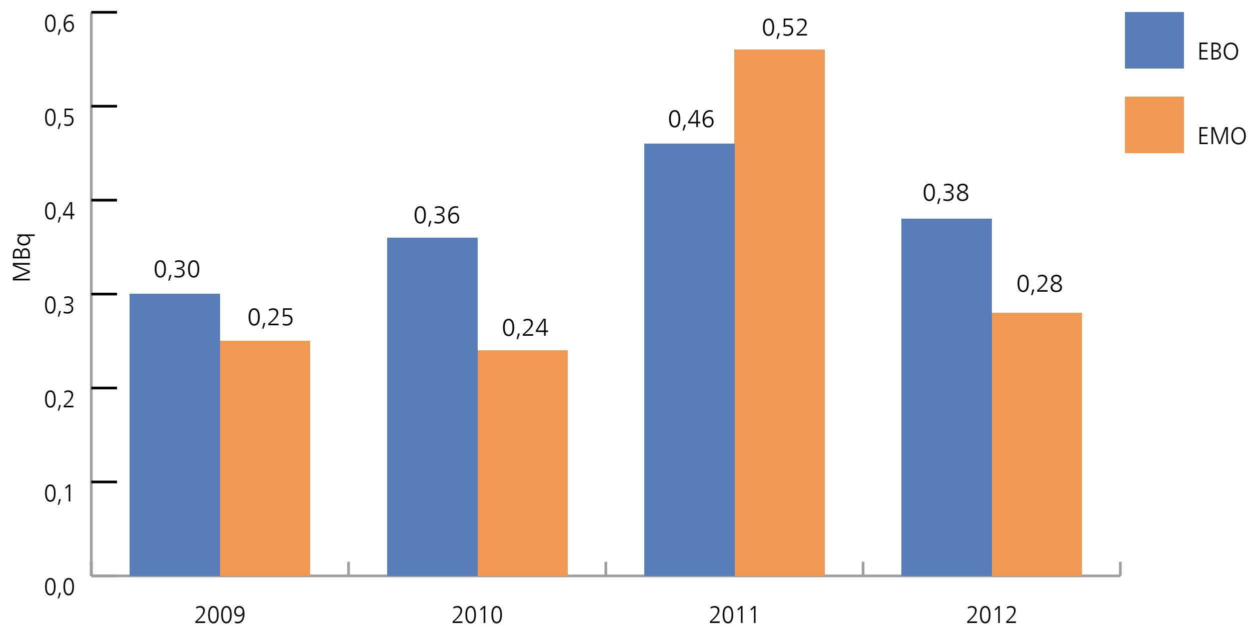
Nobel Gases



Aerosols



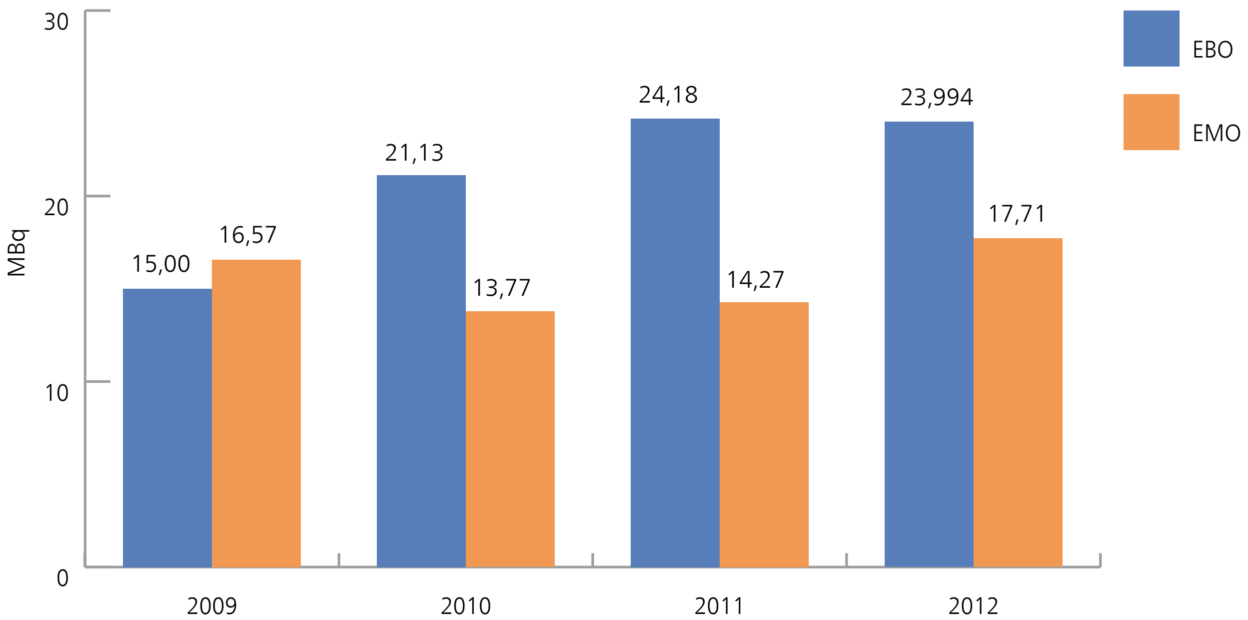
Iodine



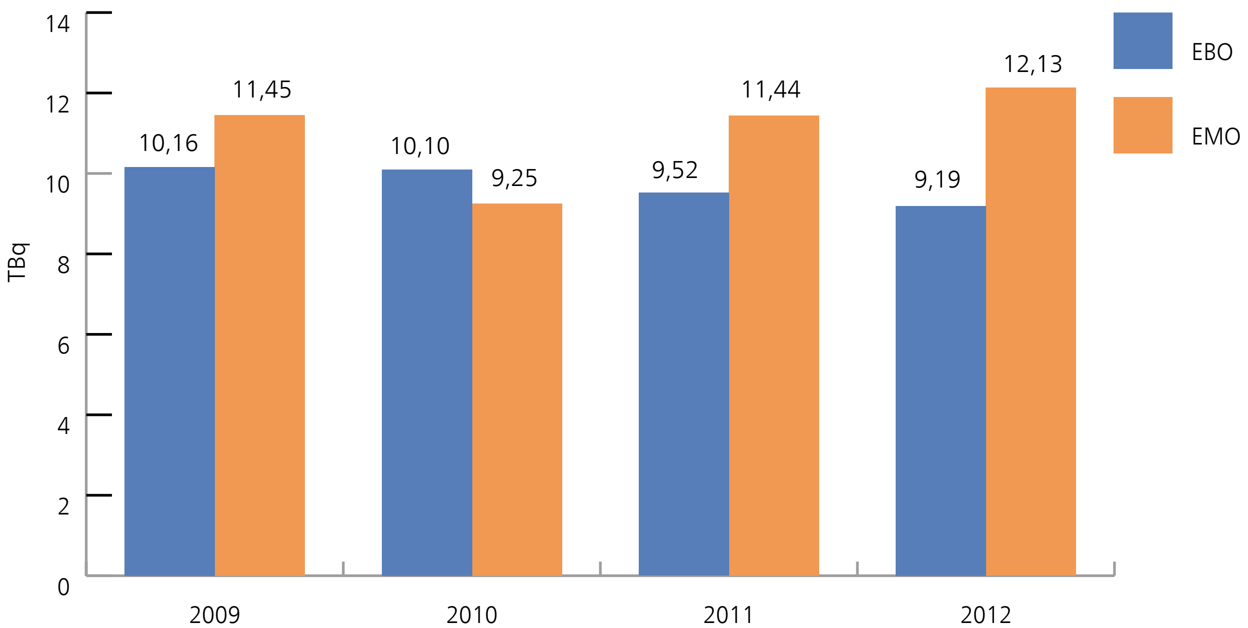
5.4 Hydrosphere Releases in 2012

Installation	Release Type	Activity	Unit	Share in targetvalue for 2012 [%]
EBO V2	V2 Activation and fissile products	23,994	MBq	0,184
EBO V2	V2 Tritium	9,190	TBq	45,95
EMO	EMO Activation and fissile products	17,710	MBq	1,61
EMO	EMO Tritium	12,130	TBq	101,08

Activation and Fissile Products



Tritium



The influence of NPP's operation on the surrounding environment was minimum. It is verified by calculating the annual doses for the inhabitants in the surroundings of the power plants pursuant to the approved conservative methodology. The calculated maximum values are about 100 times lower than the permitted limit 50 micro Sievert specified by the Public Health Authority of the Slovak Republic.

5.5 Surface Water Intake (m^3)

	EMO	EBO V2
2008	20 626 000	17 300 034
2009	20 759 000	19 247 895
2010	21 012 188	19 456 871
2011	22 956 812	20 192 550
2012	23 003 000	20 963 176

5.6 Wastewater Discharge (m^3)

Year		2008	2009	2010	2011	2012
Total volume	EMO	4 812 000	4 818 835	5 426 855	5 679 231	5 628 735
	EBO V2	2 808 004	3 150 973	3 326 105	3 249 542	3 544 966
Industrial wastewater	EMO	4 721 000	4 818 835	5 315 940	5 577 398	5 528 028
	EBO V2	2 792 529	3 133 12	3 254 693	3 192 615	3 494 207
Treated sewage water	EMO	91 000	83 825	110 915	101 833	100 707
	EBO V2	15 475	17 852	71 412 *	56 927	50 759
Allowed annual water discharge limit for 2 units	EMO	6 000 000				
	EBO V2	3 626 640				

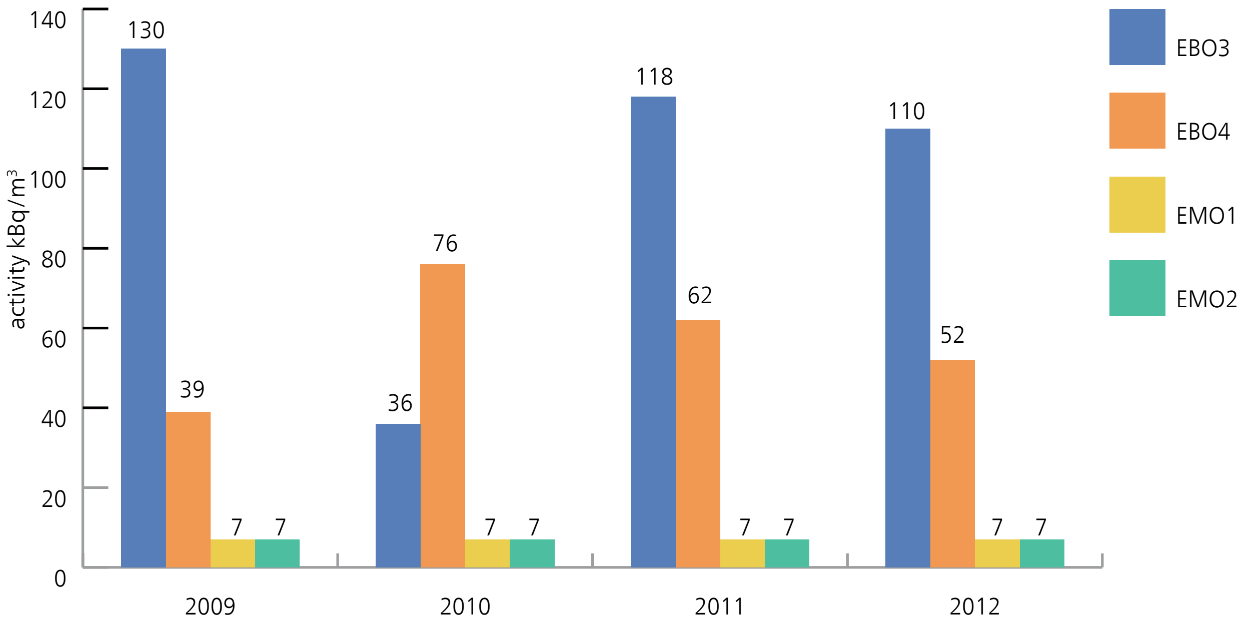
* The increase in the volume of WWTP-treated sewage water compared to previous years was caused by an increase in the consumption of potable water due to cleaning of water reservoirs and subsequent washing and rinsing after disinfection; the Emergency Response Centre construction investment project and the increase in contractors onsite during June 2010. Another cause for an increase in the amount of potable water was a leak in the potable water main onsite at V-2 NPP. All parameters for discharged wastewater complied with stipulated limits and no values were recorded above any of the permitted values.

6. BARRIER TIGHTNESS

NPP design incorporates physical barriers tasked with limiting the propagation of fissile products contained in primary circuit water into other technical equipment in the power plant. The functionality of these barriers is monitored and assessed during operations. See the report on the safety of nuclear installations published by Slovenské elektrárne, a subsidiary of the Enel Group, in 2012.

6.1 Blowdown Water Activity

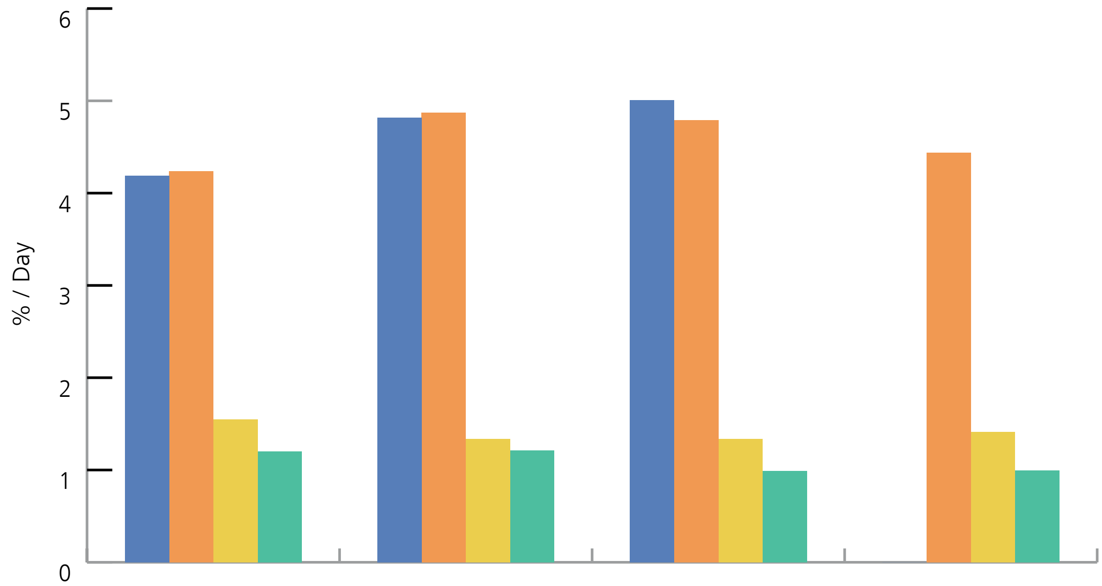
This indicator is defined as the highest value of the total β-activity of the dry residue from the blow down water from individual steam generators.



Small leakages in steam generator tubes were recorded, checked and subsequently remedied in both units at Bohunice NPP.

6.2 Containment Tightness

This indicator monitors containment tightness as the third physical barrier against the release of fissile products. This indicator is defined as the resulting value of air lost from hermetically sealed compartments over a period of 24 hours expressed as a % of the volume of such compartments at the overpressure of 150 kPa.



	2009	2010	2011	2012
EBO3	4,19	4,82	5,01	
EBO4	4,24	4,87	4,79	4,44
EMO1	1,55	1,338	1,338	1,41
EMO2	1,20	1,21	0,989	0,996

Containment tightness is defined by prescribed Limits and Conditions.
For EBO V2, containment tightness is defined as containment losses and cannot exceed 13% per 24 hours.
For EMO, containment tightness is set at 5% per 24 hours.

Note: Containment seal testing was not required at the 3rd unit at EBO V2 in 2012 pursuant to the stipulated criteria.

7. EMERGENCY PLANNING AND PREPAREDNESS /EPP/

Slovenské elektrárne, a subsidiary of the Enel Group, as a NPP operator pursuant to the above act (the Atomic Act) and related regulations related to emergency preparedness is in charge to ensure emergency planning and preparedness tasks pursuant to the approved **„On-site Emergency Plan“**.

Slovenské elektrárne fulfils tasks related to continued preparedness in terms of emergency planning for accidents or emergencies, the occurrence of which is highly improbable. The internal emergency preparedness system is continuously updated and maintained and is the subject of regular training.

The main emergency preparedness objectives are to assure technical, personal and documentation preparedness among employees and external collaborators in order to successfully respond to emergencies; specific activities are conducted in order to mitigate the risk of an accident or emergency or to lessen their impacts, to avoid serious threats to health and to reduce the risk of predictable and probable impacts of such emergencies on health.

The replacement of iodine tablets distributed to households in at-risk areas was secured in 2012 with the cooperation of state and local government.

Activities conducted in 2012 forming the prerequisites for anticipated improvements in the emergency planning process at Slovenské elektrárne included the following:

1. The new warning and notification system was brought online as of January 1, 2012 for residents living in the protected zone around Bohunice NPP.

2. The „HAVRAN 2012“ collaborative emergency site drill was held with the participation of crisis teams at the District Office level in the regions of Trnava, Trencin and Nitra. The Central Crisis Team at the state government level was also involved in the drill.

3. Reconstruction of the EMO Emergency Control Centre (ECC) was completed with coverage provided to all four units at the NPP.

   The existing Emergency Control Centre was expanded to include capacity for 4 units in connection with the construction of the Mochovce NPP Units 3&4. Just like at Bohunice, this project features resistant and hermetically-sealed shielding and the ECC has been completely equipped with communication equipment with a fixed link to continuous operations of the NPP for NRA SR and SE-HQ.

   The ECCs at both sites are equipped with software for classifying events, forecasting and evaluating the consequences of emergencies. Currently, design work is underway for the EMO ECC with respect to the placement of control panels for severe accident management.

4. A new „Cooperation and Mutual Assistance Agreement for Emergencies at Nuclear Installations“ was approved and signed by SE, a.s. and the Ministry of Interior of the Slovak Republic.

5. Emergency planning was also the subject of stress tests as a result of the accident at Japan's Fukushima Daiichi NPP with these tests resulting in measures contributing to even higher level of emergency preparedness at our nuclear installations. These measures will be completed from 2013-2015.

Slovenské elektrárne's long-term, strategic goal for emergency preparedness is continuous improvement in all involved processes, which is to be achieved by leveraging internal experience and the experience of other power plant operators around the world, by monitoring criteria and indicators of emergency preparedness process activities and by following rules applicable to this process in line with the principles and characteristics of the safety culture.

8. SAFETY IMPROVEMENTS

The following projects were implemented at EBO V2 and EMO in 2012 in order to improve safety:

- Set of measures was adopted after the accident in Fukushima,
- Additional tasks related to severe accident management at EBO and EMO; this project is scheduled for completion at Bohunice in 2013 and at Mochovce in 2015,
- Use of a new generation GD II fuel in EMO and EBO reactor cores.

9. MEASURES ADOPTED AFTER FUKUSHIMA

Measures were adopted by the European Commission and at the national level after the events of March 11, 2011 that took place at the Fukushima NPP in Japan.

After the actions taken in 2011, including the definition and completion of stress tests required by the European Commission and the Nuclear Regulatory Authority of the Slovak Republic (NRA SR), SE turned its focus in 2012 on completing a complex set of measures to increase safety after the Fukushima event. These new measures are mainly focused on increasing the preparedness and ability of the power plants to deal with low-probability and unforeseen externalities that are highly unlikely and unexpected with concurrent impacts on both units at the given sites.

On December 13, 2012, Slovenské elektrárne, submitted its **Action Plan** to the NRA SR for implementation of specific steps based on the lessons learned from the events at Fukushima and from the stress tests conducted for SE's NPPs, thereby fulfilling the obligations defined in the Atomic Act pursuant to which nuclear installation operators are obliged to adopt corrective measures on the basis of root-cause analysis of operational events in order to increase nuclear safety at NPP installations.

The NRA SR then completed the **National Action Plan** for the Slovak Republic, which was sent to the European Commission at the end of 2012. The report contains the European Council's conclusions from June 2012 as well as the conclusions of the ENSREG group from July 2012 and integrates the measures proposed by the operator as well.

10. OVERALL ASSESSMENT OF NI NUCLEAR SAFETY

Nuclear safety at nuclear installations operated by Slovenské elektrárne in 2012 based on an assessment of defined operational safety indicator is considered **safe** and compliant with legal regulations concerning the use of nuclear energy while fulfilling the conditions in valid licenses and permits issued by regulatory authorities.

NPP operations by SE had minimal environmental impact and minimal radiation load on personnel at these installations or on residents.

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