ANNEX 6 Evaluation of the Safety Performance Indicators Set
(year 2006)

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A. INTRODUCTION

State Office for Nuclear Safety (SUJB) executes the state administration and supervision of the utilisation of nuclear power and ionising radiation in order to assure achieving a required safety level. As the focus of the supervision consists in the evaluation and assessment of nuclear safety related activities and their results, SUJB annually evaluates an achieved level of nuclear safety of operation of Dukovany NPP by using Safety Performance Indicators.

The Safety Performance Indicators evaluate four areas of the NPP operation:

1. Events,
2. Safety Systems Performance,
3. Barriers Integrity,
4. Radiation Protection.

The evaluation results of Safety Performance Indicators in the form of graphs for the monitored period (2001 - 2006 for Dukovany NPP and 2003 – 2006 for Temelín NPP) are stated in appendices. The graphs mostly represent local values in the form of sum totals or averages of the unit values. Only for Safety System Unavailability, the indicated values are also at the level of the systems and for Barriers Integrity at the unit level.

Input data for the evaluation were acquired both from documents submitted by the operator and by SUJB supervisory activities at Dukovany NPP and Temelín NPP.

B. EVALUATION OF THE SET OF SAFETY PERFORMANCE INDICATORS FOR DUKOVANY NPP

This section includes an evaluation of particular indicators of the monitored areas of operation of Dukovany NPP and their graphic representation is shown in Annex – Part I.

The evaluation of Safety Performance Indicators for 2006 confirms a constant high level of assurance of nuclear safety and radiation safety in power generation in Dukovany NPP.

1. Events

Group 1.A – Reportable events

The basis for the group 1.A indicators is the evaluation of reportable events according to the NPP Event specification. The indicator 1.A.1 "Number of Reportable Events" was included into the set of Safety Performance Indicators in 2003 and it superseded indicator "The Number of Safety Related Events", thus the values shown in the graph in or before 2002 represent only the total number of events evaluated according to the International Nuclear Event Scale (INES), the way the indicator was originally defined.

"There were 43 events assigned to the indicator 1.A.1 "Number of Reportable Events" (graph 1.A.1) in 2006. This value is in relation with the years 2003 and 2004.

The indicator "Number of Safety Related Events" was evaluated to the year 2002, by which only events subject to the evaluation according to the International Nuclear Event Scale (INES) were recorded. Therefore, the trend of BSE (Bellow Scale Events) and SSE (Safety Significant Events) values shown on graph of the indicator 1.A.1 may be used for partial comparison of the whole monitored six-year period. It results from the values that the number of events evaluated according to the International Nuclear Event Scale (INES) for the whole monitored period shows a fall at first and then steady state in years 2002 to 2004. After an increase of approximately 50% in 2005, previous values return in 2006.

The change of monitoring and evaluation methodology for events significant in terms of the nuclear safety reflected also in the indicator "Human Factor" (graph 1.A.2), in particular in its Human Factor Index. When evaluating this indicator, one cannot fail to notice the increase in both values both in the last year and in the total trend.

Group 1.B – Actuation of the protection and limitation systems

There was no unplanned automatic reactor scram and any of the reactors of Dukovany NPP had to be manually shutdown in the year 2006.

Results of the indicator "Unplanned Unit Scrams" are shown on graph 1.B.1,2.

The number of actuation of automatic power reductions increased in the last year, and this number was significant after deduction of six actuations at all units in occurrence of NPP island operation on August 3, 2006.

The actuation of the HO-4 protection remains on the same level after jump decrease in 2004.

The results of indicator "Automatic Power Reduction/Limitation" are shown in a common graph 1.B.3-5.

The last of the indicators of this group "Control Rod Drops" shown in graph 1.B.6 reached absolute, i.e. zero, value in 2006. Final assumptions of the evaluation on significant deviation randomness in 2005 were thus confirmed.

Group 1.D – Limits and Conditions

The indicator "Violations of the Limits and Conditions" (graph 1.D.1) reached the zero value, as in previous years. This means that no violation of the Limits and Conditions was detected in 2006. When evaluating the whole six-year period, this result has been reached for the fourth time.

The indicator "Exemptions from the Limits and Conditions" (graph 1.D.3) reached the zero value in an evaluated year. This is the third time for the whole six-year period.

2. Safety Systems Performance

Group 2.A – Safety System Unavailability

The group is monitored by means of indicator "Safety System Unavailability" for specific safety systems.

The graphs of the system sub-indicators show the decrease in value for all evaluated systems. At the same time, the value of SSU for the diesel-generators exceeds significantly the average.

Group 2.B – Failure of safety systems

According to the indicator "Starting Failures of Safety System" (graph 2.B.1) in 2006 two failures of the diesel-generators and two failures of REAZNII occurred. In terms of the whole six-year period, this is a worse average value for the diesel-generators. The value for REAZNII failure is basically also average. Other monitored systems did not fail in their start-up, which means, compared to 2005, improvement in the case of high pressure emergency core cooling systems (TJ) and steam generator emergency feed-water system (SHNPG).

Similarly, the behavior of safety systems in operation is monitored in the indicator 2.B.3. No failure occurred in safety system operation in 2006.

3. Barriers Integrity

Group 3.A – Nuclear fuel

The state of nuclear fuel is monitored by the indicator "Fuel Reliability Index" (FRI, graph 3.A.1) and the indicator "The Number of Leaky Fuel Assemblies" (graph 3.A.2). The fuel reliability formula is based on the empirical formulas and its results thus must be considered in terms of possible failure load. In practice, two or three levels of the values of the Fuel reliability factor are assessed: more than 19 Bq/g – the reactor core contains, with great probability, one to two defects; less than 19 Bq/g – the reactor core does not contain, with great probability, any fuel defect; all design values of the Fuel reliability factor less than 0.04 Bq/g are just corrected to the limit 0.04 Bq/g by reason of limited operation of the empirical formulas. All annual values of the indicator FRI since 2003 are on the level 0.04 Bq/g. The fuel leaks were not identified and hence no fuel assemblies were discarded. In total six leaky fuel assemblies were discarded to the spent fuel storage pool in the whole operation period of Dukovany NPP.

Group 3.B – Containment

Graph 3.B.1 of the indicator evaluates, through the results of the Containment periodic integral tightness testing, the tightness condition of hermetic areas. The year 2006 confirms trend of systematic increase of Dukovany NPP unit tightness, which has been recorded on all four units since 2001, except for two minor deviations. All time low leakage values for 24 hours are recorded on Unit 1 and 4 during the Periodic integral tightness testing. In terms of containment tightness, the best results are recorded on Unit 4 on a long-term basis.

4. Radiation Protection

Group 4.A – Staff

The indicator "Collective Effective Dose per Unit" (graph 4.A.1) monitors collective effective dose of NPP staff, suppliers and visitors converted per one unit. A decreasing trend of the indicator value has stabilized in last two years on the value of approximately 0.2 Sv. Graph 4.A.2 of the indicator "Collective Effective Dose" shows that this trend relates both to NPP staff and to suppliers.

A reduction in the number of radiation employees in 2006 compared to 2005 (Dukovany NPP staff by 8%, suppliers by 6%) became evident in proportional increase in the indicator "Specific collective Dose per Capita" (graph 4.A.3). The indicator "Maximum Individual Effective Dose" (graph 4.A.4) has increased in the last three years in suppliers, however, it remains below 10 mSv/year. Both mentioned indicators also document that supplier's staff are exposed to radiation more than Dukovany NPP staff.

The indicator "The Number of Workers with Special Decontamination" (graph 4.A.5) shows permanently very low level and documents a high safety level at work with ionizing radiation sources of more than 1,800 radiation employees of Dukovany NPP in 2006.

Group 4.B – Radioactive Releases

The indicators "Gaseous Releases" and "Liquid Releases" evaluate the operation of Dukovany NPP in terms of radioactive releases. Their graphs 4.B.1 and 4.B.2 document that the committed effective doses from the releases are in both cases lower for the population in a calendar year than the limits (the limit for gaseous releases is 40 μSv and 6 μSv for liquid releases).

C. EVALUATION OF THE SET OF SAFETY PERFORMANCE INDICATORS FOR TEMELÍN NPP

This section includes an evaluation of particular indicators of the monitored areas of Temelín NPP operation and their graphic representation is shown in Annex – Part II.

The operation of Temelín NPP was evaluated by means of safety indicators in 2006 for the fourth time. Similar statistic comparison may be performed for this period as at Dukovany NPP.

1. Events

Group 1.A – Safety Significant events

The basis for the group 1.A indicators is the evaluation of the number of events evaluated according to the International Nuclear Event Scale (INES). Compared to previous years, a rather significant decline in the number of these events was recorded. When comparing single units, longer operational experience at Unit 1 is apparently a determining factor. However, compared to previous years, no significant decline in the proportion of human factor impact occurred, which resulted in percentage increase in the proportion of human factor impact with the decreased total number of events. Safety significant events according to the INES level 1 were recorded in four cases in 2006 at Temelín NPP.

Group 1.B – Actuation of the protection and limitation systems

There was no unplanned ROR (reactor scram on the basis of primary causes in PRPS system) in 2006 at Temelín NPP. Therefore, no actuation of ROR occurred for four years at Unit 1. An automatic reactor shutdown was recorded in one case at Unit 2 by LS(d) type – actuation of the limitation system on the basis of primary causes in RCLS system.

At the same time, the number of actuation of safeguards in the form of limitation system by other types (a, b, c) significantly increased, with a great increase in LS(a) actuation occurring in approximately half of the cases at unit start-up, this is certainly a negative finding (graph 1.B.3-5).

Group 1.D – Limits and Conditions

In 2006, there were two cases of Violation of LaP (graph 1.D.1), which is the same number as in previous years. The violation of LaP was detected by the operator in both cases. Therefore, the Temelín NPP is near the acceptable level on a long-term basis, i.e. one violation of LaP per unit per year.

Two "Exemptions from LaP" were approved by SÚJB in the last year. Both cases concerned modification of LaP at Unit 2, by which the operator responded to unexpected bending of fuel pins and fuel assemblies mounted with cluster not seating on mechanical stops.

2. Safety Systems Performance

Group 2.A – Safety System Unavailability

For indicator "Safety System Unavailability" (graphs 2.A.1a-g), a significant decrease of its values is documented in 2006 for all monitored safety systems, except for diesel generators, where a stagnant trend was recorded in the last year.

Group 2.B – Failure of safety systems

In 2006, five failures occurred at safety system start-up, see indicator "The Number of Starting Failures" (graph 2.B.1). Two cases involved the second diesel generator at Unit 1 and one case involved the third system diesel generator at Unit 2. The emergency steam generator feedwater system and the boric acid emergency injection system show one failure each.

3. Barriers Integrity

Group 3.A – Nuclear fuel

The state of nuclear fuel is monitored by the indicator "Fuel Reliability Index" (FRI, graph 3.A.1) and the indicator "The Number of Leaky Fuel Assemblies" (graph 3.A.2).

There were six leaky fuel assemblies detected during the refueling outage in 2006 at Unit 1. All these assemblies were repaired and used for the next fuel cycle. Ten leaky fuel assemblies were detected at Unit 2, five of which were not allowed to be reloaded, and therefore, they were directly stored in the spent fuel storage pool. Only two of the remaining five assemblies were repaired, and the rest (three fuel assemblies) were stored in the spent fuel storage pool as "irreparable".

Group 3.B – Containment

In this group, there is only one indicator, which evaluates, the results of the Periodic integral tightness testing, the tightness condition of hermetic areas in graph 3.B.1. In 2006, no Periodic integral tightness testing was performed at any unit. The trend of measurements performed in previous years corresponds to design expectations as well as international experience.

4. Radiation Protection

Group 4.A – Staff

The indicator "Collective Effective Dose per Unit" (graph 4.A.1) monitors collective effective dose of NPP staff, suppliers and visitors converted per one unit. The indicator "Collective Effective Dose" (graph 4.A.2) monitors total collective effective dose of Temelín NPP in distribution of NPP staff and suppliers. Compared to 2005, a significant decrease in both of the indicators occurred, and that was by 40%.

It will be appreciated that decrease in the indicator "Specific Collective Dose per Capita" (graph 4.A.3) by 34% for radiation employees of suppliers actively contributed to the above mentioned decrease in collective effective dose. The indicator "Maximum Individual Effective Dose" (graph 4.A.4) also decreased in suppliers compared to 2005. It is apparent from both last mentioned indicators that exposure of suppliers' staff to radiation is much higher than exposure of Temelín NPP staff.

Occurrence of only one case in the indicator "The Number of Workers with Special Decontamination" (graph 4.A.5) documents a high safety level at work with ionizing radiation sources of approximately 1,500 radiation employee of Temelín NPP in 2006.

Group 4.B – Radioactive Releases

Graph 4.B.1 "Gaseous Releases - Committed Effective Dose" represents the exposure of individuals from the most exposed population group acquired by calculation from the authorized model for current radionuclide effluent to the air and the current meteorological situation in the evaluated year. The values show that the SÚJB annual authorized limit of 40 μSv is drawn on the level of approximately 0.1% in the last years.

Graph 4.B.2 "Liquid Releases - Committed Effective Dose" represents the exposure of individuals from the most exposed population group acquired from the authorized model for current radionuclide effluent to the stream and the current hydrological situation in the evaluated year. The SÚJB annual authorized limit of 3 μSv was drawn on the level of approximately 13% in 2006.

D. CONCLUSION

Based on the results of particular Safety Indicators for 2006 it may be stated that the previous high level of nuclear and radiation safety in power generation at **Dukovany NPP** was confirmed in all monitored areas.

After a slight increase in 2005, the values of the majority of the indicators in the area "Events" returned back to the level of 2003 and 2004. The values of the indicator "Human Factor" indicate sustained difficulties of the NPP with the human factor, which caused 30% of "Reportable Events". Most cases involved supplier errors and the operator should focus its activity on this area in event prevention.

The implementation of the T544 project – I&C System Renovation did not affect the results in 2006. However, the number of unplanned actuation of limitation system significantly increased, that is by nearly seven times. Although two thirds of the increase was caused by actuation of the limitation systems during two island operations of the NPP in summer months 2006, five actuations of limitation system is the maximum value in the monitored period.

By modifying inadequate technical solution of new electric circuits of control rod drives at Unit 3 the indicator value returned to the level of 2004.

The values of the indicator "Safety System Unavailability" for single systems continued the decrease from 2005 and thus reached the level of 2003. The only significant exception is the diesel-generator system, which is, except for 2003, above location value of the unavailability of "general" safety system, when the value for diesel-generator indicator increased nearly twice in 2006. All values are well below the value of 10^{-2}, which is regarded as the acceptable limit for the value of safety system unavailability. Higher unavailability of diesel-generator system also results from the lower reliability of this system during start-up.

The area "Barriers Integrity" did not get off the favorable trend of previous years. The results of integral tightness testing further decreased at all units.

Based on the above mentioned results of the indicators of the area "Radiation Protection" it may be stated that radiation protection assurance at Dukovany NPP is on a high level. The collective effective dose shows steady state of absolute as well as relative values in the last three years with a slight increase in maximum individual effective dose for suppliers.

Both liquid and gaseous effluents are maintained on a very low level.

The results of the evaluation of a set of Safety Indicators for **Temelín NPP** for 2003 to 2006 give a view of the trends in the NPP operation.

A significant decrease of "Safety Related Events" between 2005 and 2006 draws attention to the area "Events", however, a high proportion of human factor in such events persists.

A low number of reactor scrams by means of PRPS and LS is favorable, on the other hand, actuation of other limiting functions of LS increased in particular in the period of unit start-up after refueling.

There were again two cases of LaP violatons, each unit one case, which is a negative feature.

The value of the general safety system unavailability significantly decreased in the area "Safety System Unavailability" and returned to the value of 2003. The diesel-generators system is the only system, which has "kept" a negative trend. The diesel generator at Unit 1 plays an important role here. Similar to Dukovany NPP, higher unavailability of diesel-generator system also results from the lower reliability of this system during start-up.

The area "Barriers Integrity" in 2006 recorded especially deteriorated fuel tightness at Unit 2, which is indicated by the values of both indicators, i.e. "Fuel Reliability Index" and "The Number of Leaky Fuel Assemblies". Efficiency of measures taken by the operator as well as fuel producer will document the indicator results for 2007. The values of the indicators for the area "Radiation Protection" in the group "Staff" show decrease in 2006 compared to 2005 and they reached the level of 2003.

A low drawing on allowable limits is documented in the group "Radioactive Effluents", however, triple increase in effluents of radioactive iodine isotope related particularly to Unit 2 outage draws attention to the necessity of giving increased attention to the indicator in 2007.

The above summary of the results of particular areas of the set of safety indicators provided a sufficient overview of the state and assurance of nuclear and radiation safety in operation of Dukovany NPP and Temelín NPP, and in spite of negative trends in some areas to be addressed by SÚJB inspections in 2007, did not indicate any immediate hazardous aspects.

E. ABBREVIATIONS:

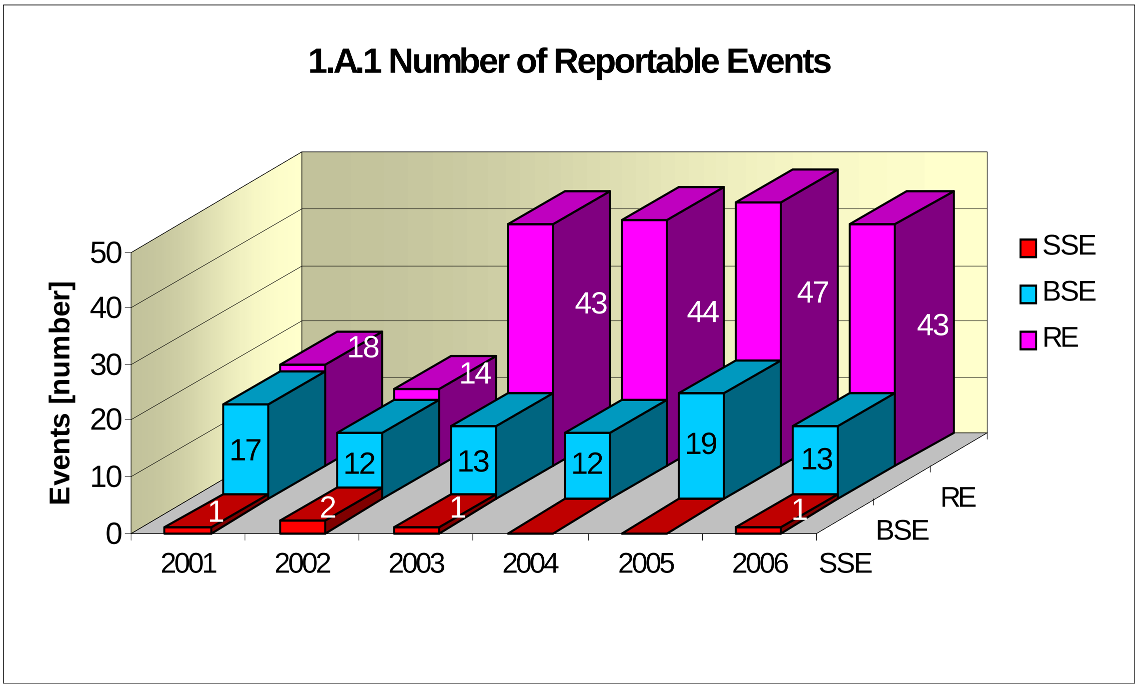
AŠP	Activated and fission products
AZ	Reactor core
BL	Safety limit
BS	Safety system
BSVP	Spent fuel storage pool
ČEZ	Business name of the Czech utility - joint stock company ČEZ, a. s.
DG	Diesel generator
E	Individual effective dose
EDU	Dukovany nuclear power plant
ETE	Temelín nuclear power plant
GO	Overhaul
HA	Hydro-accumulator
HMG	Time schedule
HP	Hermetic premises
HN PG	Steam generator auxiliary feed-water system (Dukovany NPP)
INES	International Nuclear Event Scale
JB	Nuclear safety
JE	Nuclear power plant
LIJB	SÚJB local inspectors
LS (a,b,c,d)	Limitation system (various actuation functions)
LaP (L&C)	Limits and Conditions
LPP	Limiting condition for operation
NT	Low-pressure system
NOS	Protection system setting
OKJZ	Nuclear installation inspection section
OROPC	Fuel cycle radiation protection section
OZIK	Repetitive containment integrity test
PG	Steam generator
PBU	Safety indicator(s)
PERIZ	Periodic integral tightness testing

PERZIK	Periodic containment integrity test
PRPS	Primary reactor protection system
RB	Reactor unit
RC	Regional center
REAZNII	Automatics of emergency power system – category II
ROR	Reactor scram
S	Collective effective dose
SAOZ (SHCHAZ)	Emergency core cooling system
SHN PG	Steam generator emergency feed-water system (Dukovany NPP)
SW	Software
SZB	Safety assurance system
TJ	High-pressure emergency core cooling system
TH	Low-pressure emergency core cooling system
TQ	Dukovany NPP spray system / Temelín NPP emergency core cooling systems and spray system
TX	Emergency steam generator feedwater system (Temelín NPP)
VT	High-pressure system
ZIK	Structural over-pressure test
ZKOB	Safeguards and protection testing

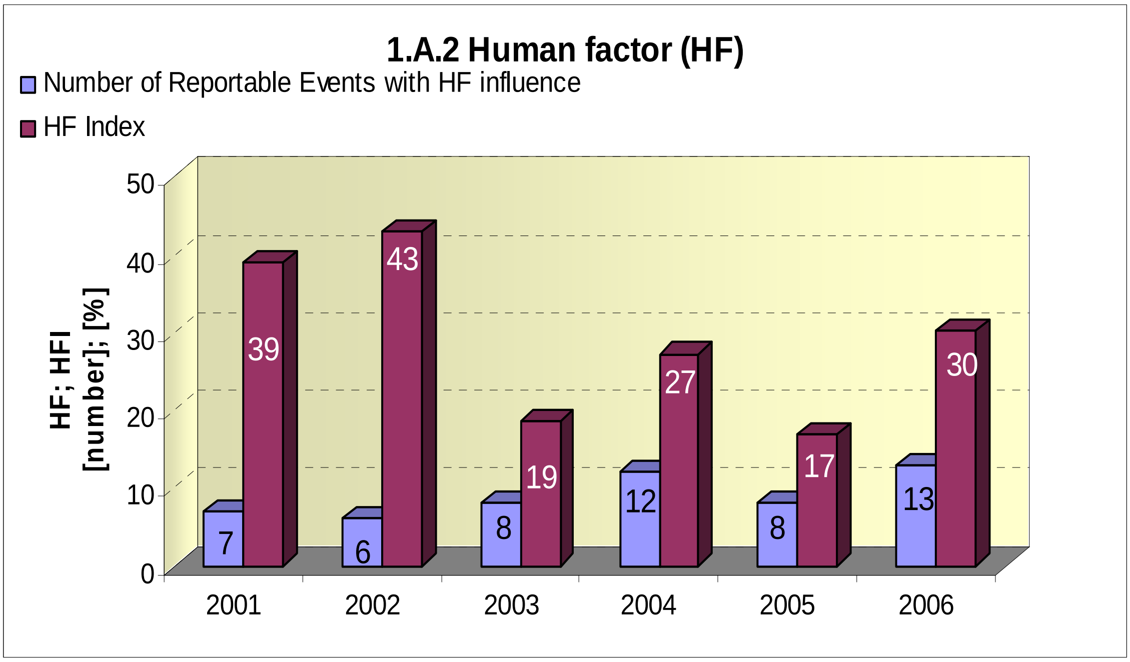
1. Significant Events

1.A Reportable events

Graph of indicator 1.A.1 monitors the development of number of reportable events (RE) including its division according to the evaluation of the International Nuclear Event Scale (INES) into significant events (SSE, INES > 0) and the below scale events (BSE, INES = 0). Until 2002 the RE indicator was equal to summary of SSE and BSE.

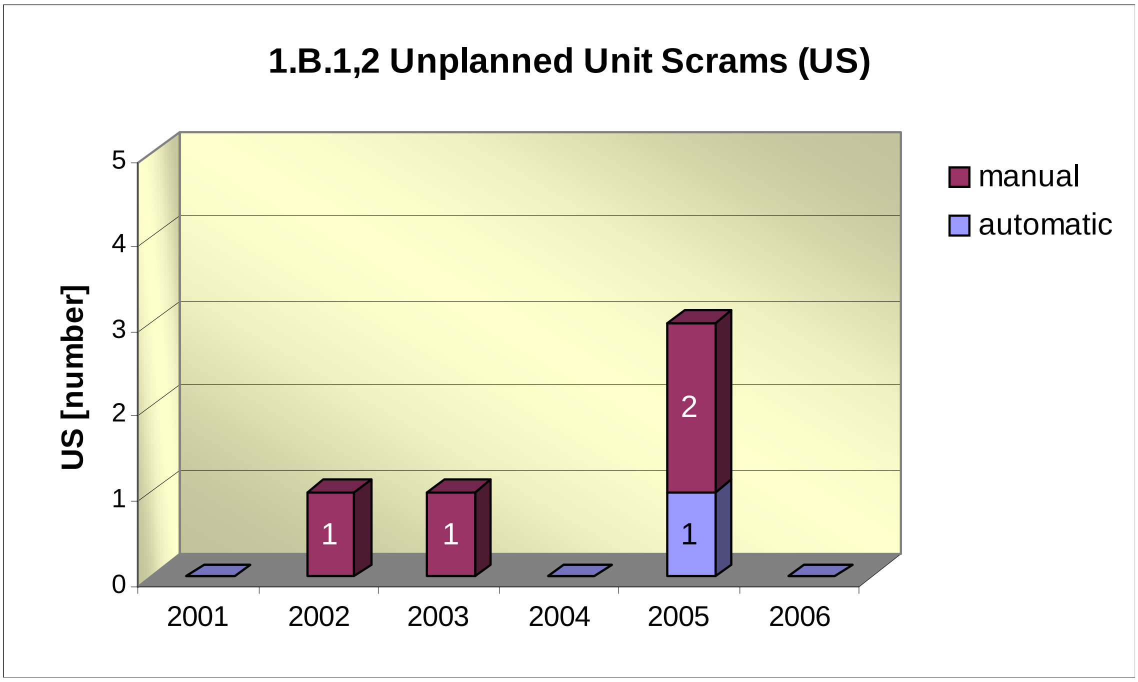


Graph 1.A.2 evaluates the influence of the human factor upon occurrence of reportable events. Until 2002 the number of reportable events corresponds with number of events according to INES. The indicator is expressed by the number of the reportable events with an influence of human factor (HF) and its percentage share (HFI).

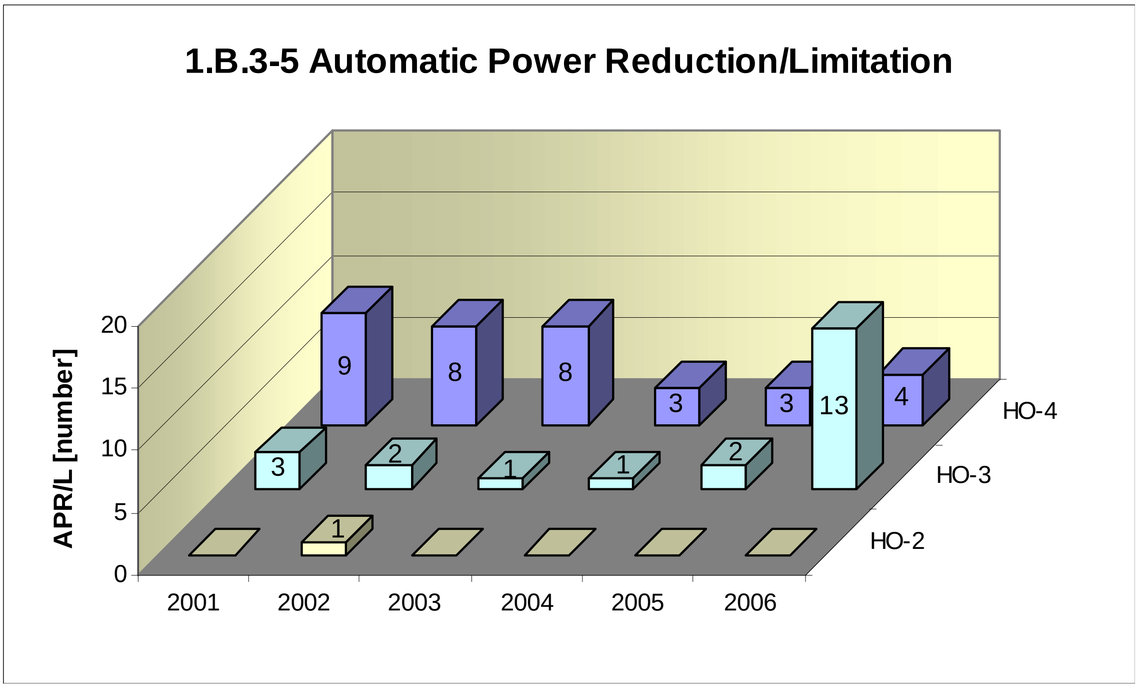


1.B Actuation of the protection and limitation systems

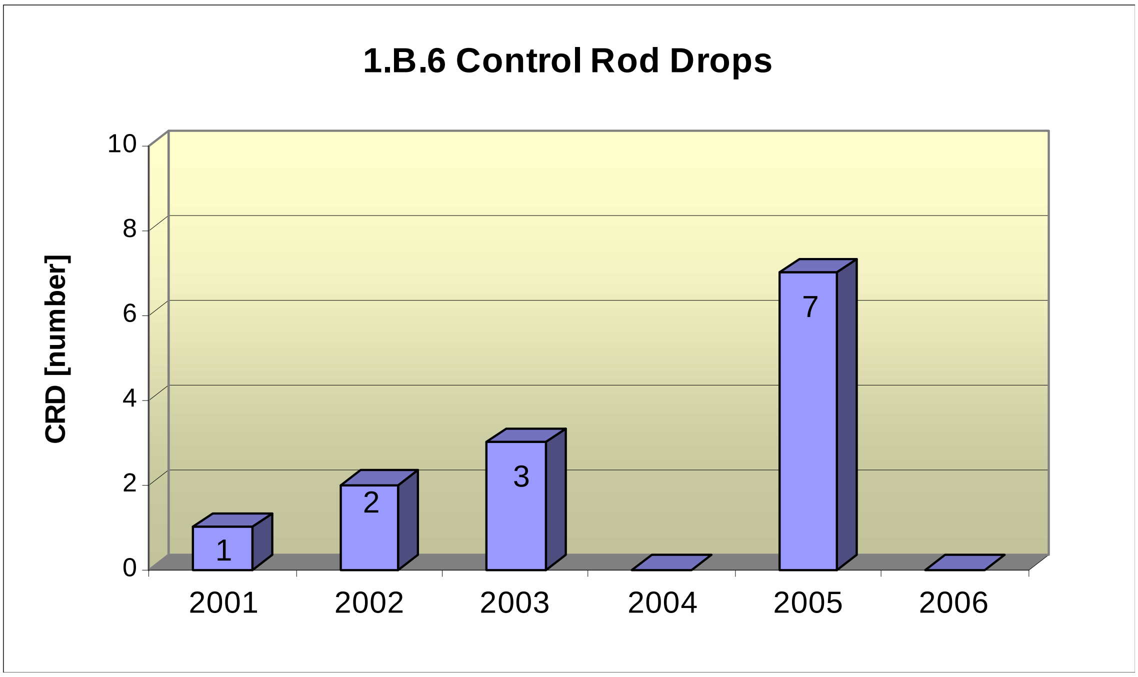
Graph 1.B.1,2 summarises the total number of unplanned unit scrams (US) (reactor in MODE 1 or 2) with resolution of manual and automatic shutdown. The term unplanned means that the scram was not an expected part of the planned test.



A common graph of indicators 1.B.3-5 presents the number of unplanned automatic power reduction (APR) by emergency protection of the 2nd – 4th type (HO-2, HO-3 a HO-4).

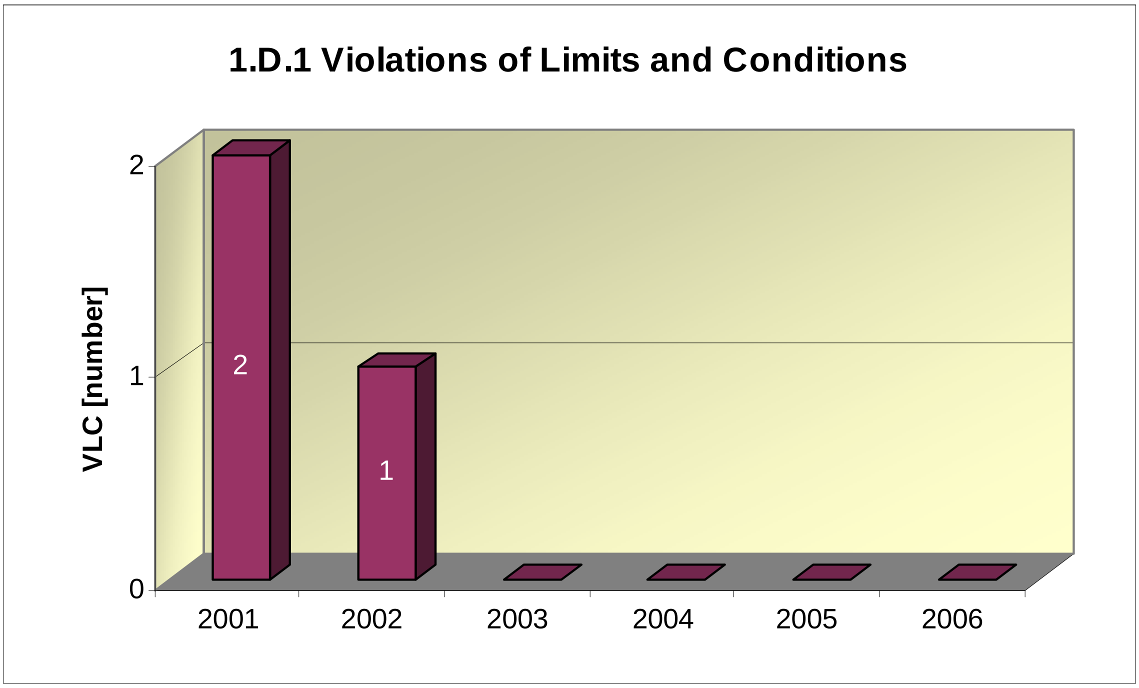


Graph 1.B.6 presents the development of the number of control rod drops (CRD).

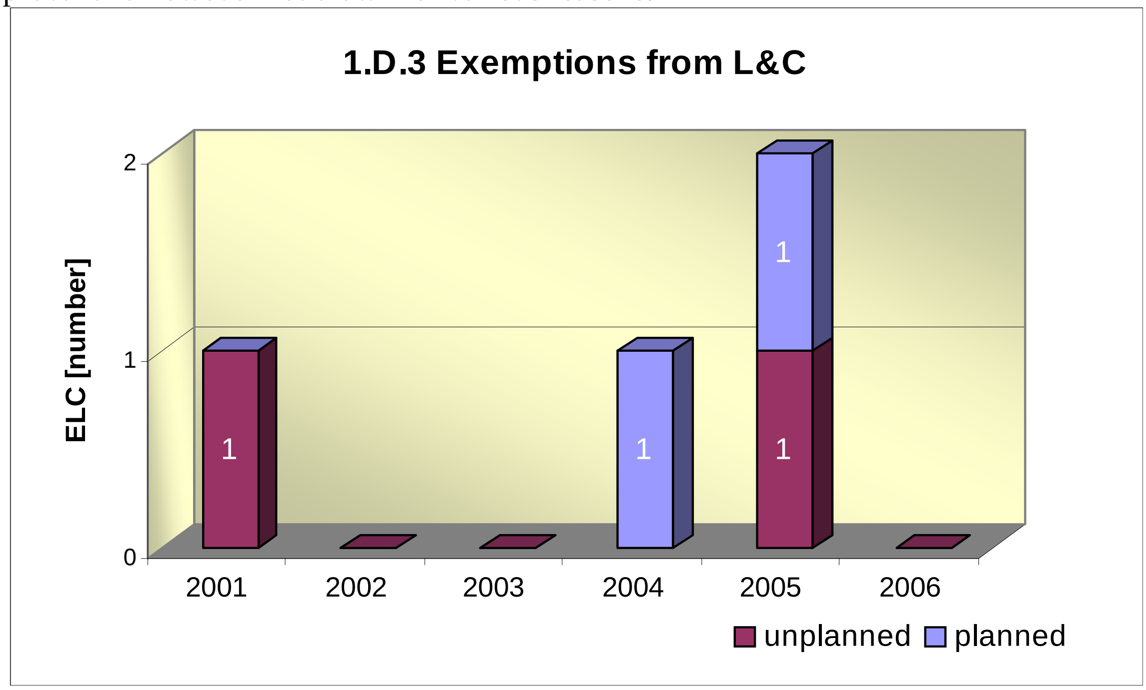


1.D Limits and Conditions

Graph 1.D.1 summarises violations of the Limits and Conditions (VLC) detected by the Regulatory body or reported to the Regulatory body by the licensee.



Graph 1.D.3 summarises the number of planned and unplanned exemptions from the Limits and Conditions (ELC) approved by the Regulatory body including those requiring SUJB approval and however not drawn for various reasons.



2. Safety Systems Performance

Area 2 monitors and evaluates availability of the following safety systems (BS) in group A:

- diesel generators	**DG**
- high pressure emergency core cooling system	**TJ**
- low pressure emergency core cooling system	**TH**
- spray system	**TQ**
- hydro-accumulators	**HA**
- steam generator auxiliary feed-water system	**HN PG**
- steam generator emergency feed-water system	**SHN PG**

and in group B failure of diesel generator (DG), high pressure emergency core cooling system (TJ), low pressure emergency core cooling system (TH) and spray system (TQ) in starting and operation.

2.A Safety system unavailability

Unavailability of particular safety systems (SSU$_S$) - graphs 2.A.1.a – g, is defined as the ratio of the total time of unavailability of an evaluated safety system to the total time when its availability was required. In addition, these combined graphs express the ratio of unavailability of respective safety system to the “general” safety system of the site.

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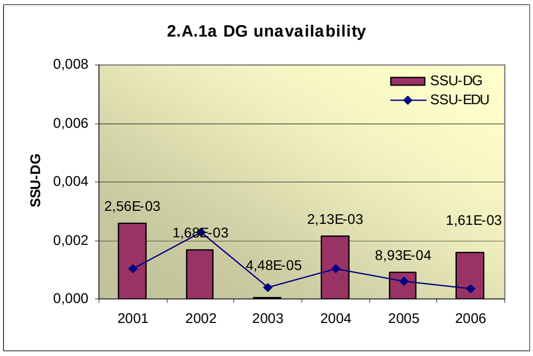
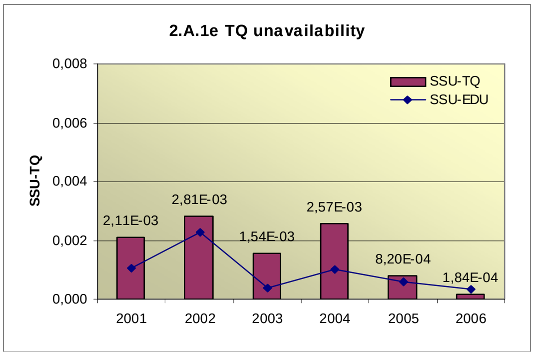
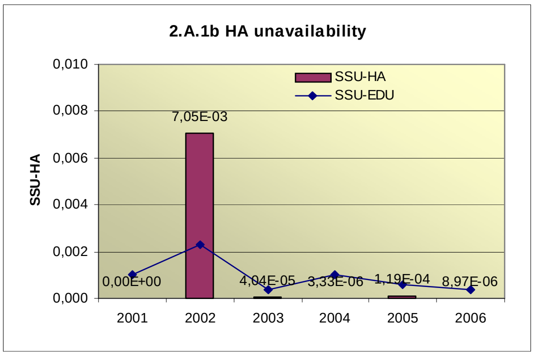
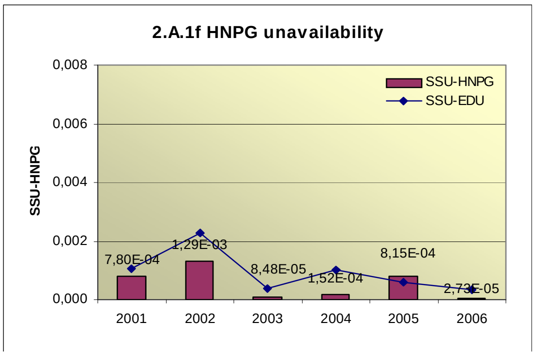
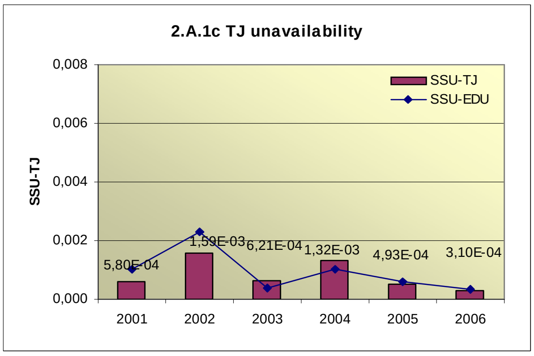
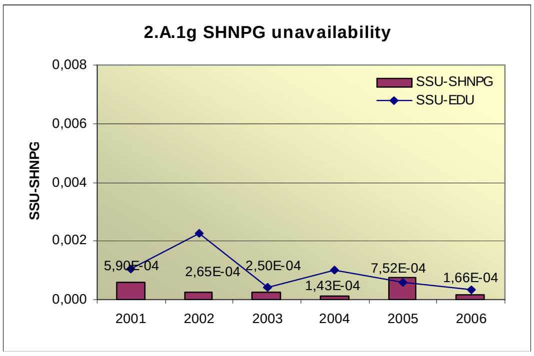


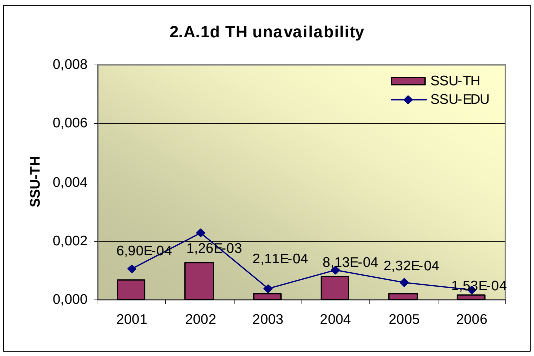






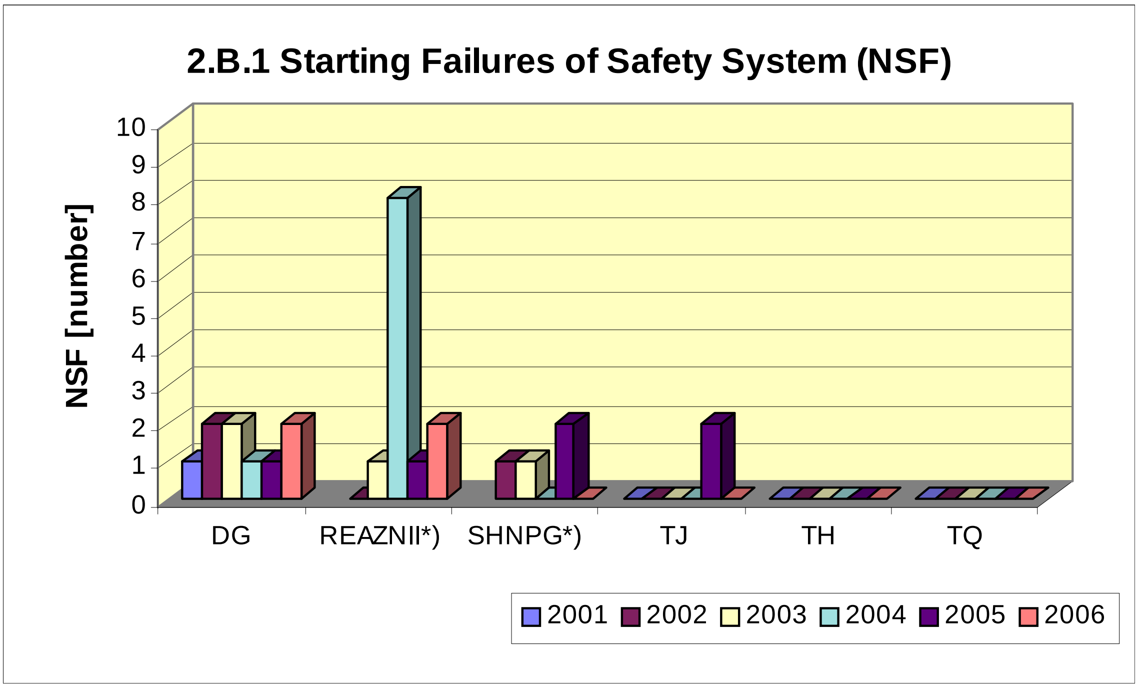




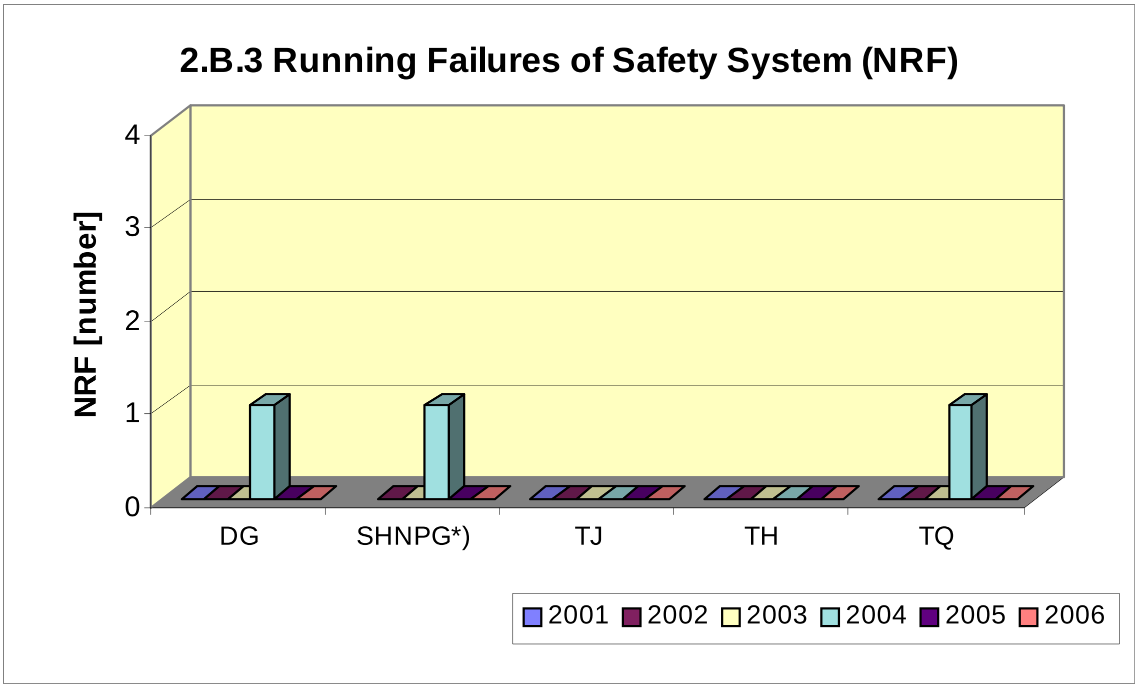


2.B.1 Failure of safety systems

Graph 2.B.1 indicates the number of starting failures of the safety system (NSF), i.e. the state when the respective system, possibly set after the command to start, does not achieve nominal performance characteristic or its failure (shutdown) occurs within 30 minutes after its start.



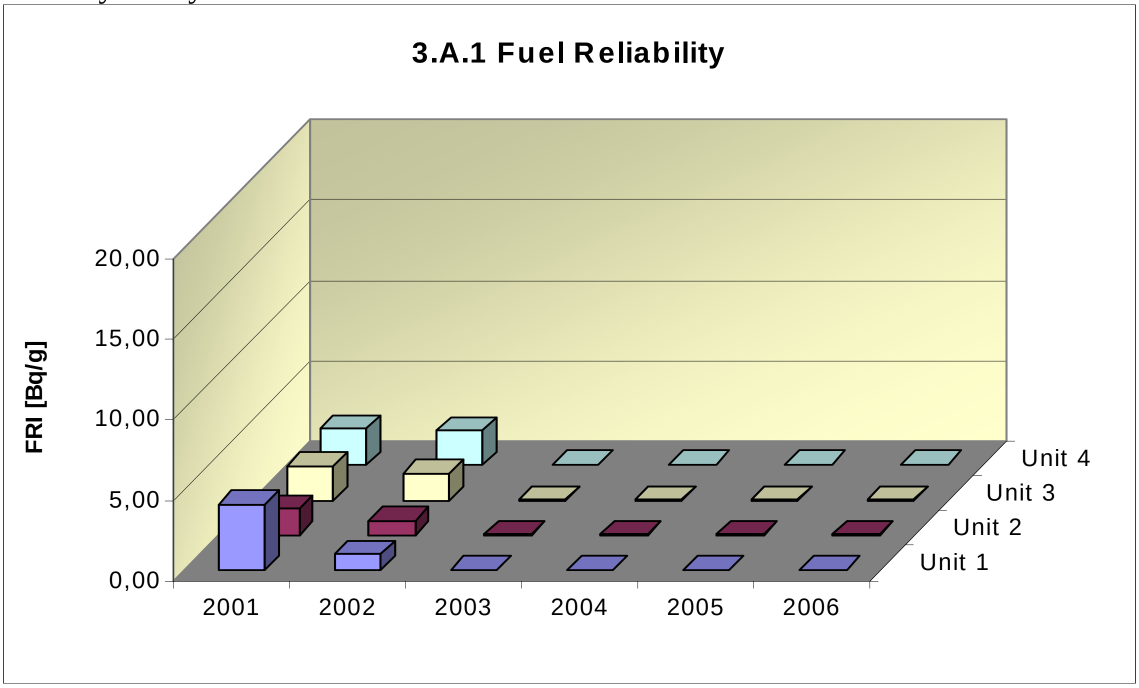
Graph 2.B.3 indicates the number of running failures of safety system (NRF), i.e. the number of states when failure shut down of respective system, drive, possibly set occurs at nominal performance characteristics for the time exceeding 30 minutes since its starting.



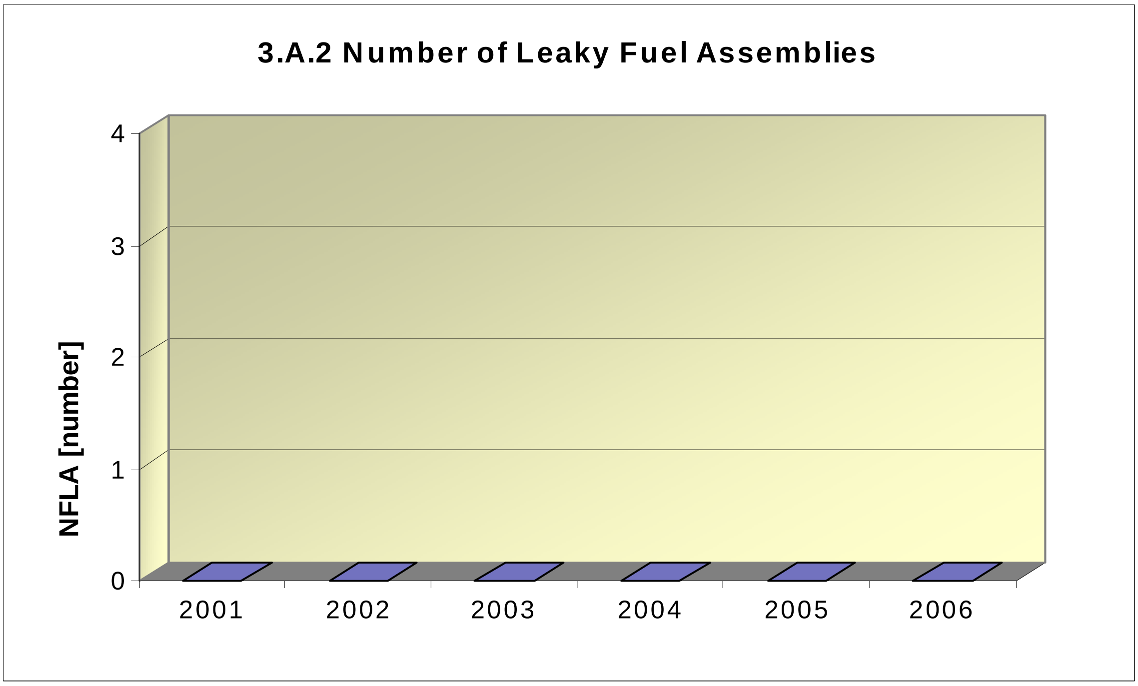
3. Barriers Integrity

3.A Nuclear fuel

Graph 3.A.1 monitors fuel reliability of particular units through the values of FRI - Fuel reliability index. The value FRI ≤ 19Bq/g expresses that reactor core most likely does not contain any steady fuel defects.

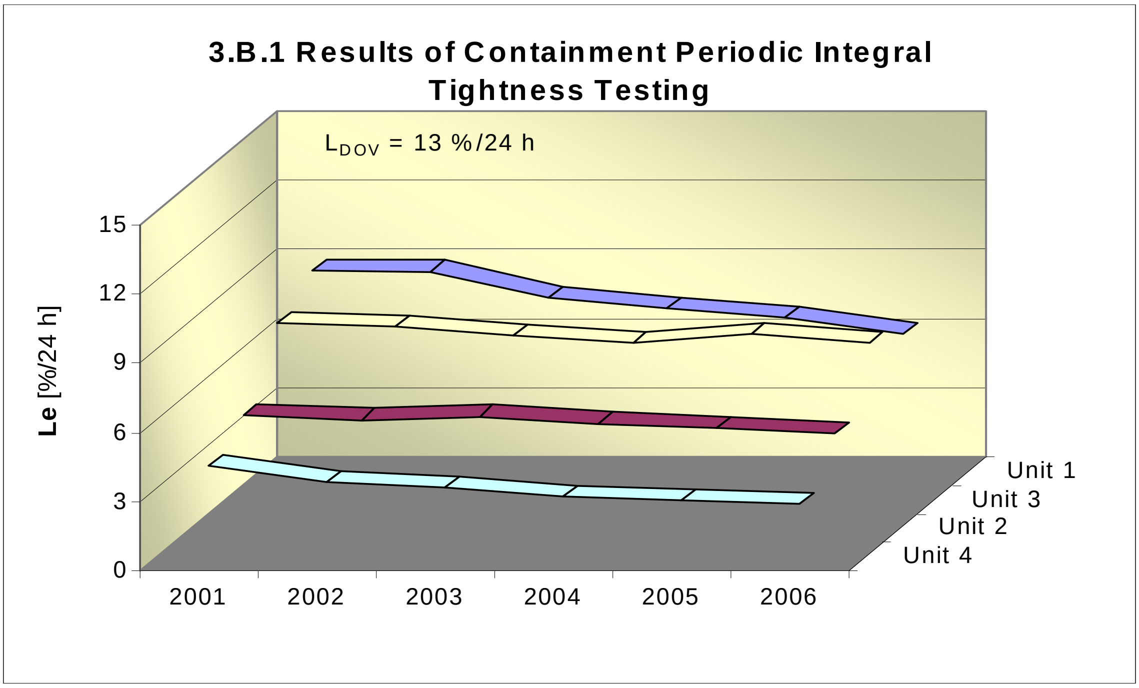


Graph 3.A.2 indicates the number of leaky fuel assemblies (NLFA) that had to be put out of operation due to their inadmissible leakage.



3.B Containment

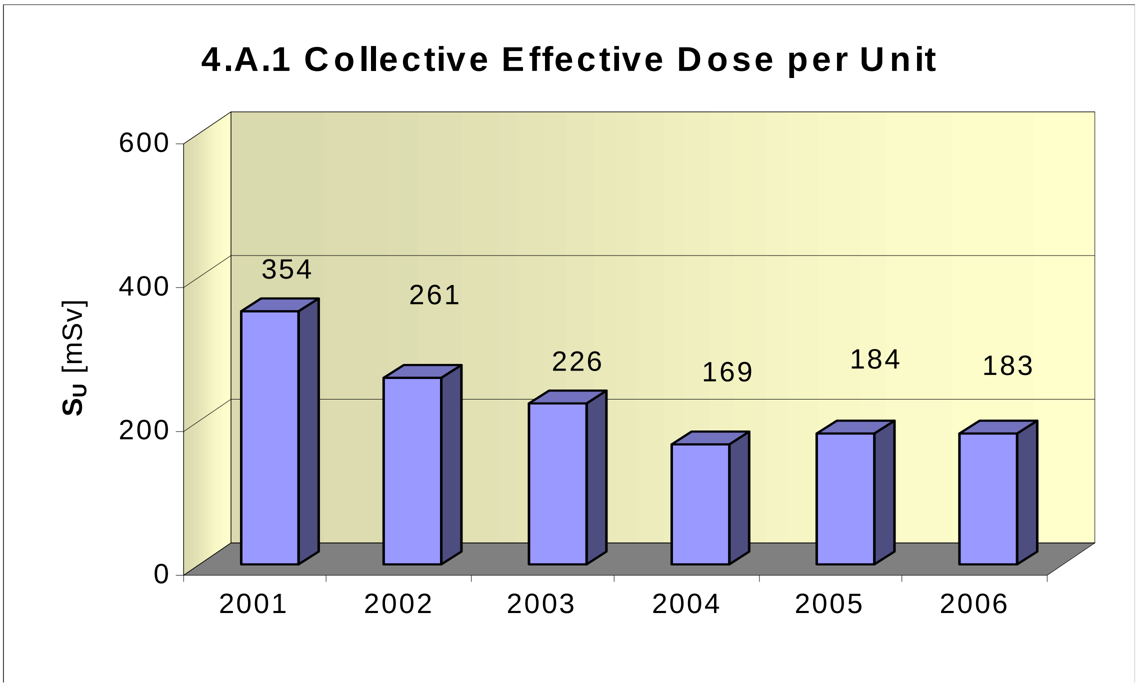
Graph 3.B.1 states the results of Containment periodic integral tightness testing (L_e), i.e. the results of leakage tests of hermetic areas executed by overpressure 150 kPa lasting 24 hours. Extrapolated results are included for the tests with a lower pressure and dwell.



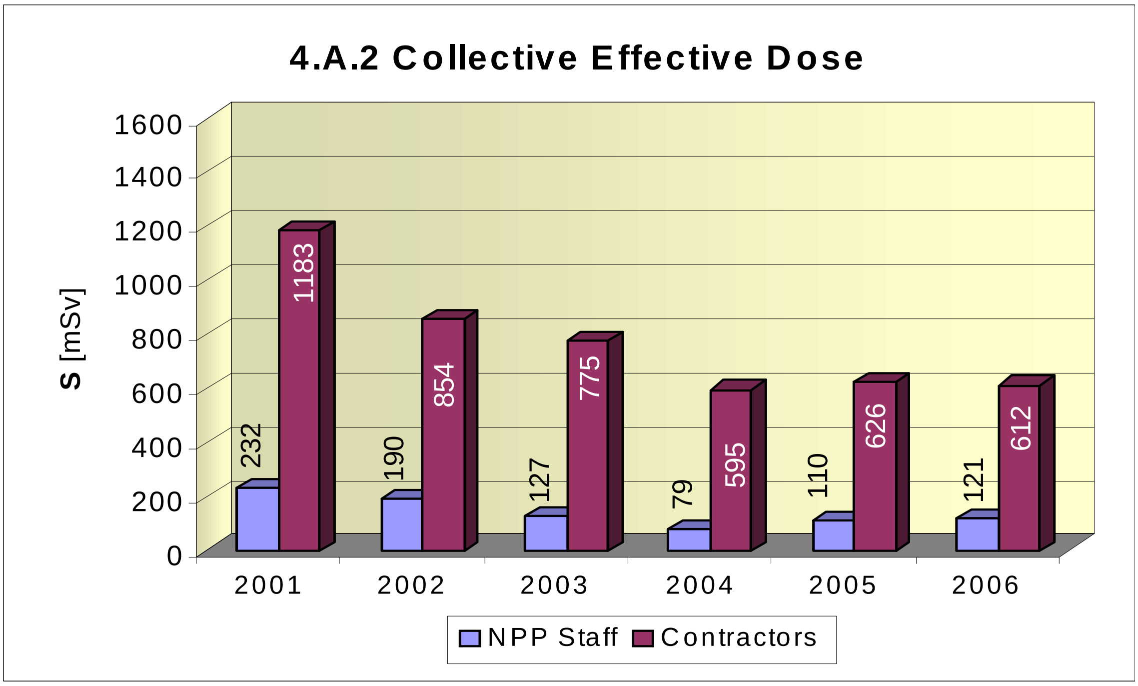
4.Radiation Protection

4.A Staff

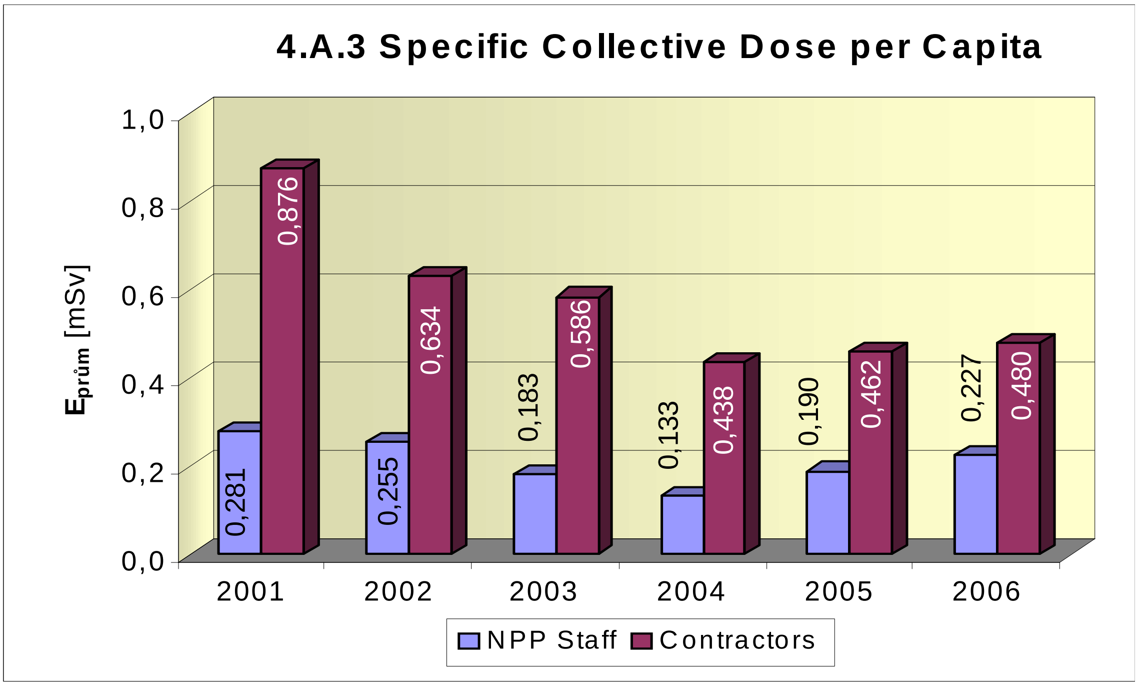
Graph 4.A.1 indicates collective effective dose (CED) received by the staff of NPP (including suppliers and visitors) during monitored period, measured by basic film dosimeters and expressed by mean value per unit.



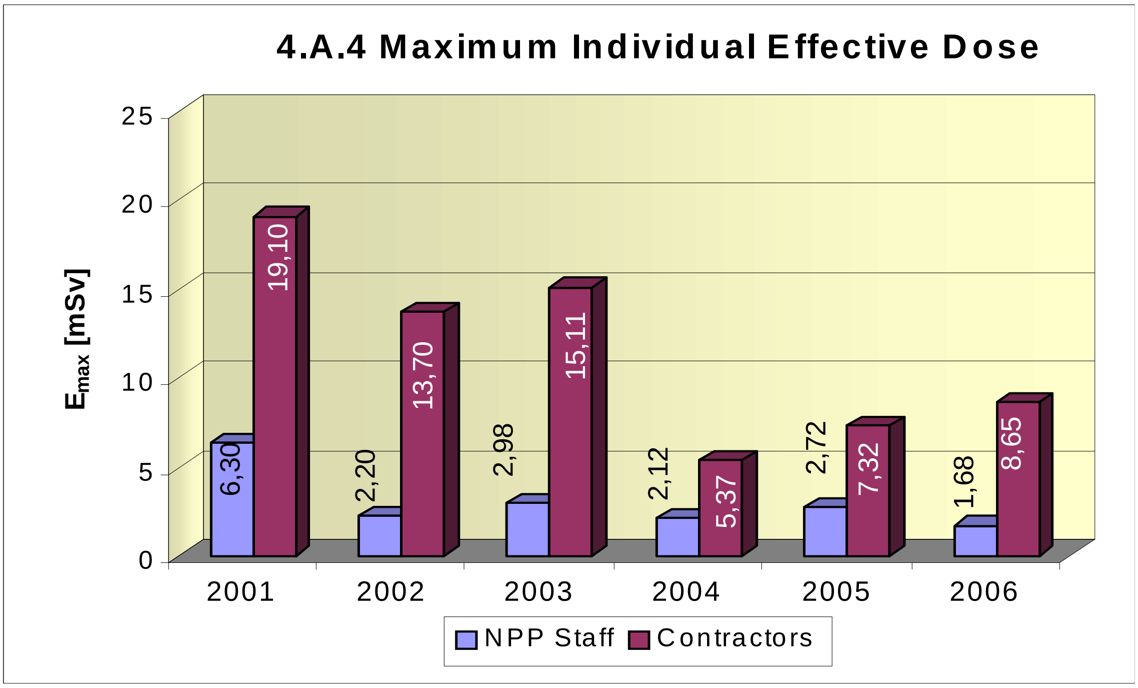
Graph 4.A.2 indicates collective effective dose received by the staff of NPP and suppliers during monitored period, measured by basic film dosimeters.



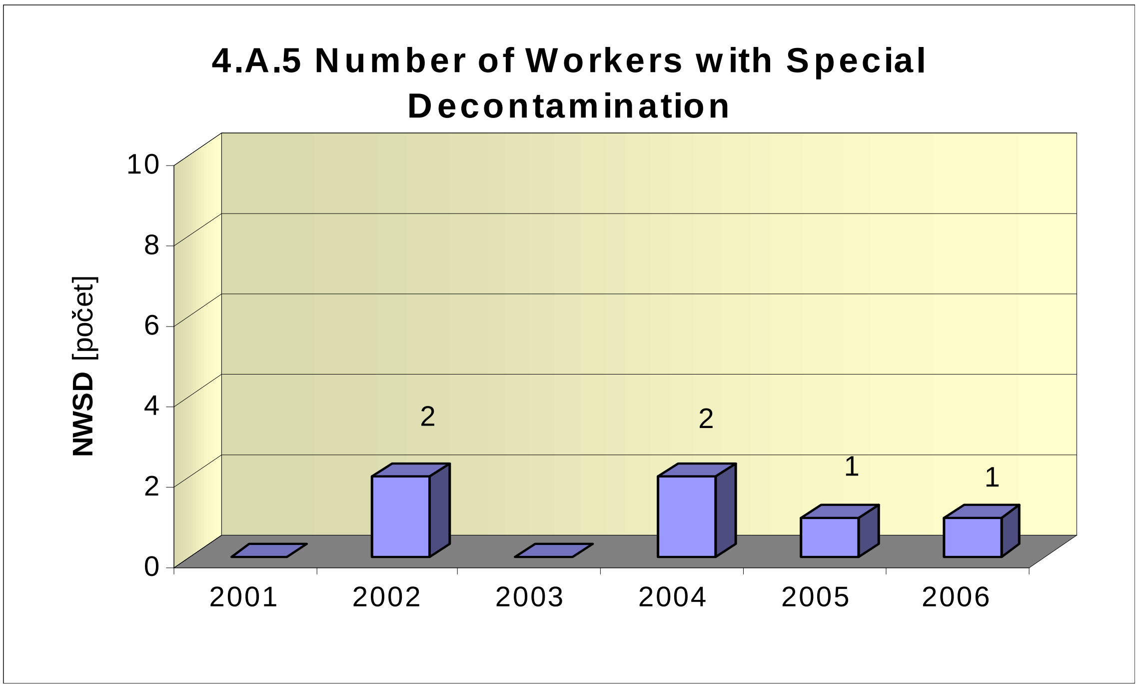
Graph 4.A.3 indicates specific collective effective dose received by the staff of NPP and suppliers during monitored period, measured by basic film dosimeters and express by value per one radiation worker.



Graph 4.A.4 indicates maximum individual effective dose received by one particular employee of NPP and one particular employee of supplier during monitored period, measured by basic film dosimeters.

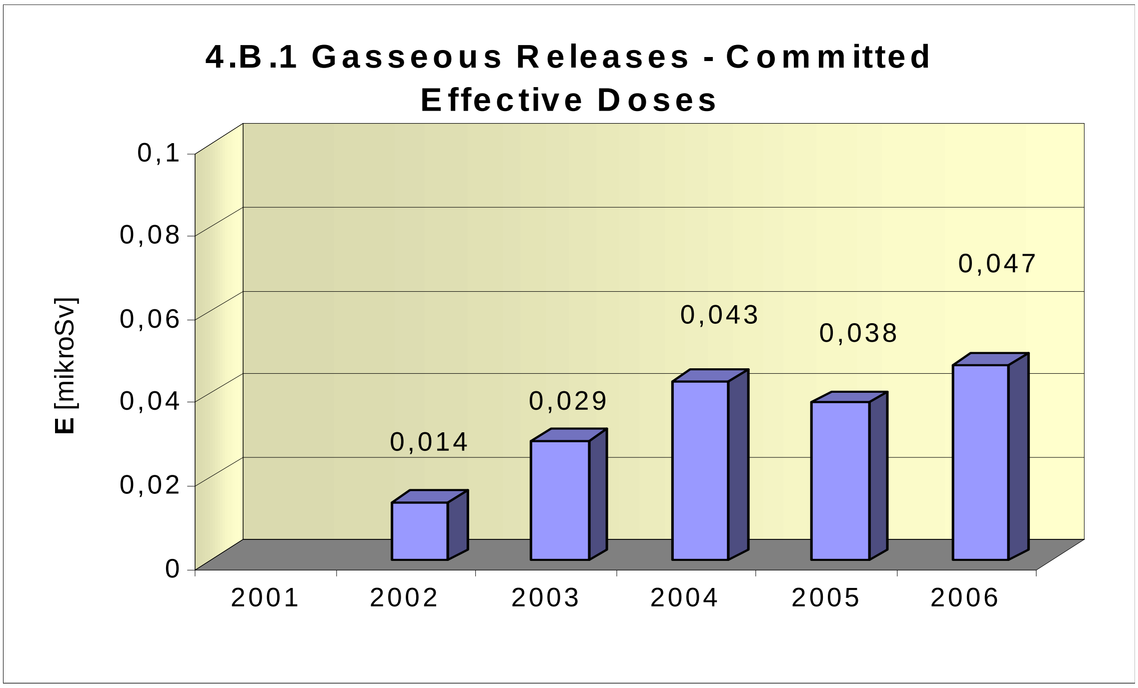


Graph 4.A.5 indicates number of workers (NPP and suppliers) subjected to a special decontamination under medical supervision.

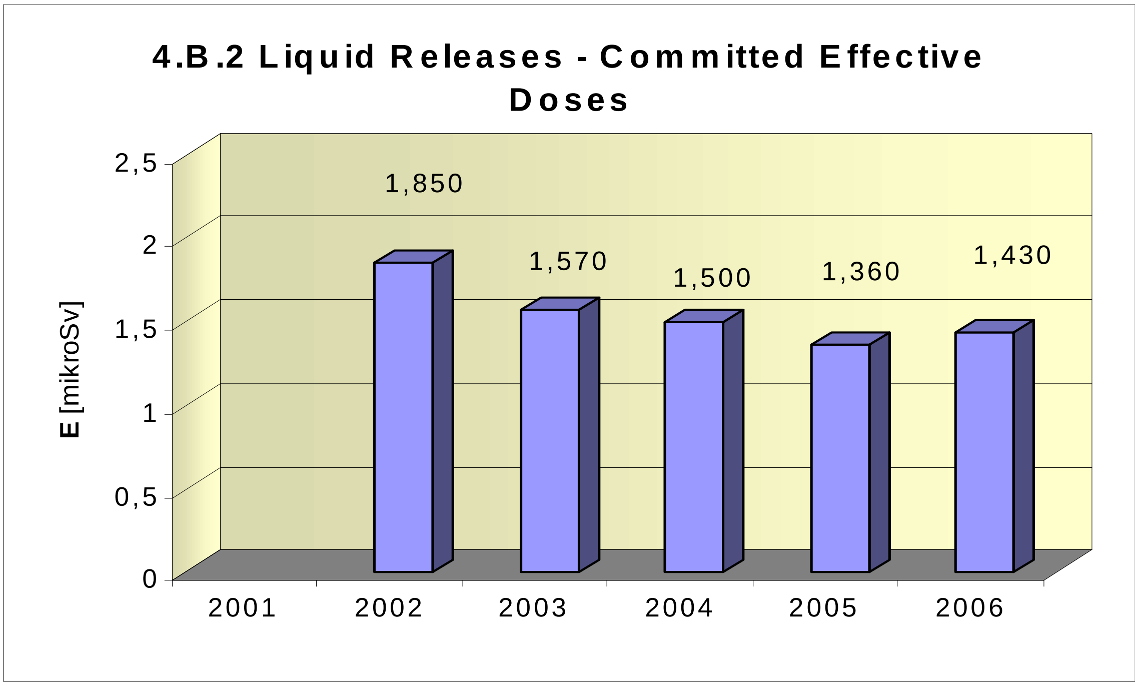


4.B Radioactive Releases

Graph 4.B.1 indicates the committed effective dose for an individual, which arises from radioactive gaseous releases from NPP.



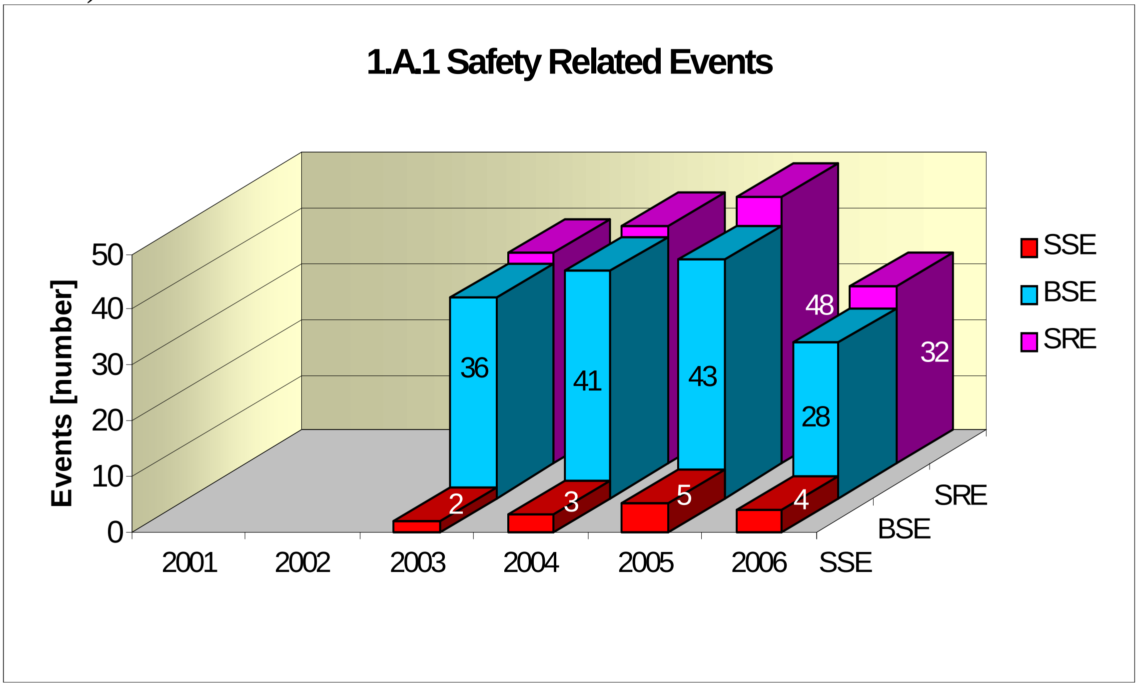
Graph 4.B.2 indicates the committed effective dose for an individual, which arises from radioactive liquid releases from NPP.



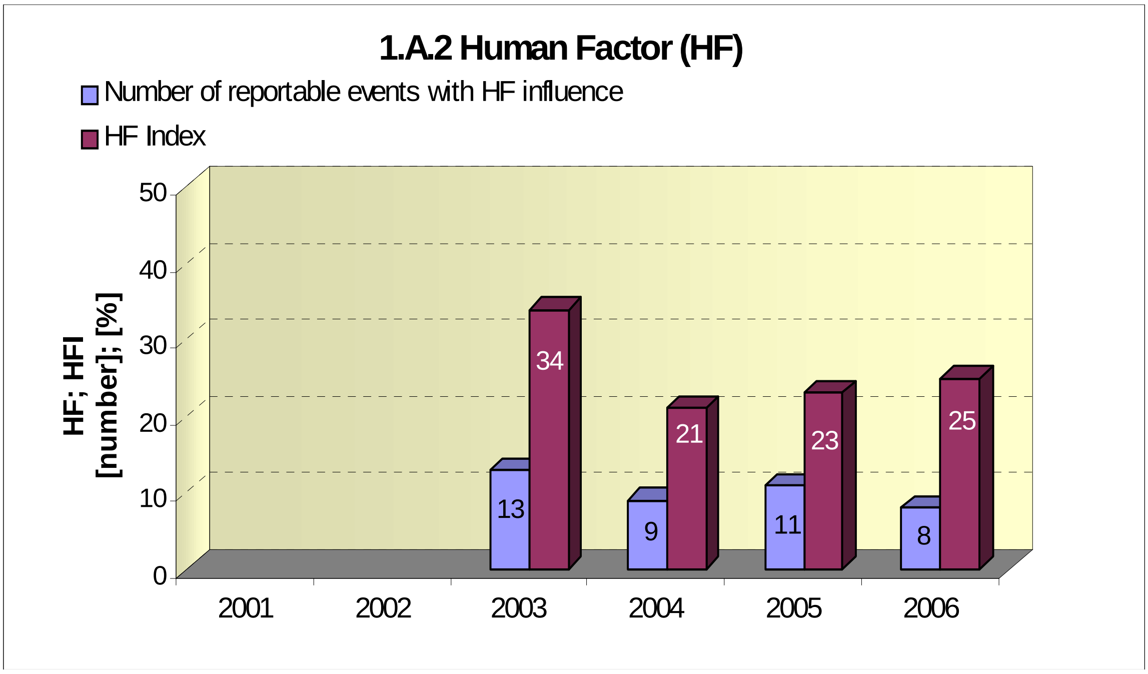
1. Significant Events

1.A Safety related events

Graph of indicator 1.A.1 monitors the development of the number of safety related events (SRE) including their division according to the evaluation of the International Nuclear Event Scale (INES) into significant events (SSE, INES > 0) and the below scale events (BSE, INES = 0).

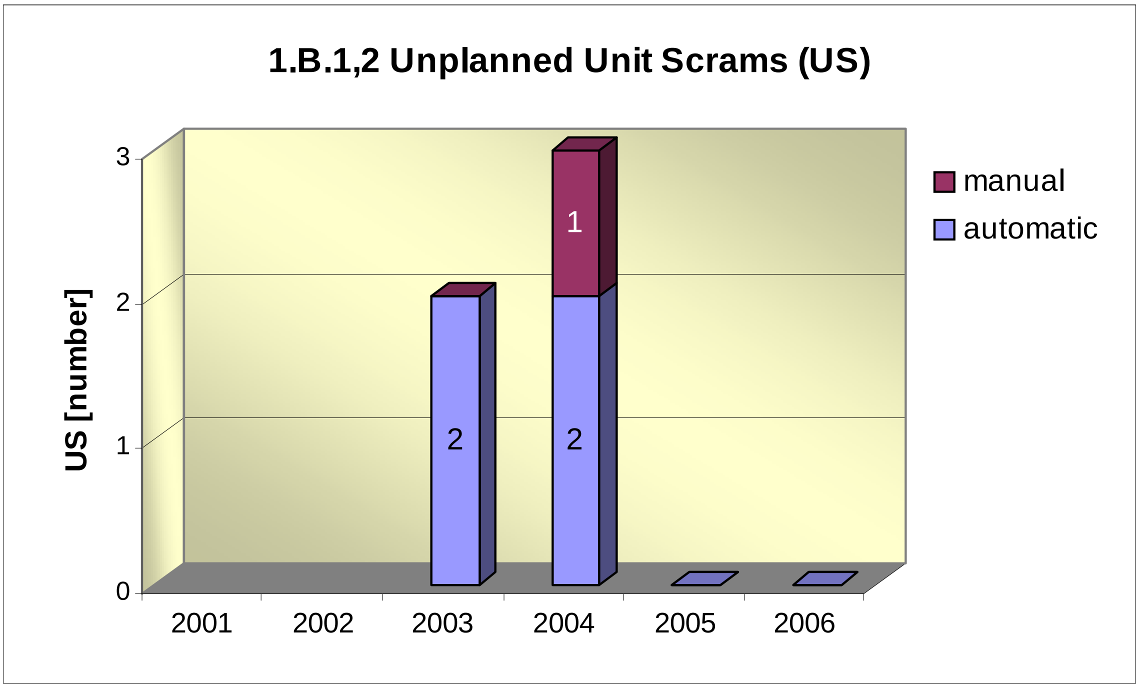


Graph 1.A.2 evaluates the influence of the human factor upon occurrence of safety related events. The indicator is expressed by the number of the safety-related events with an influence of human factor (HF) and its percentage share (HFI).

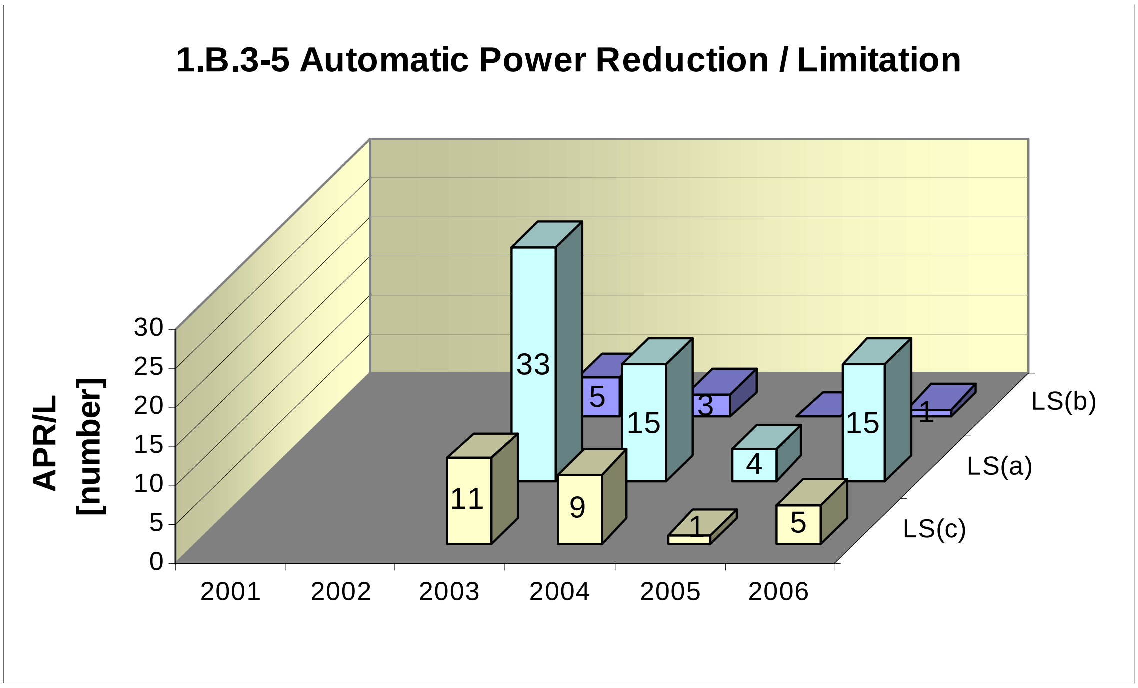


1.B Actuation of the protection and limitation systems

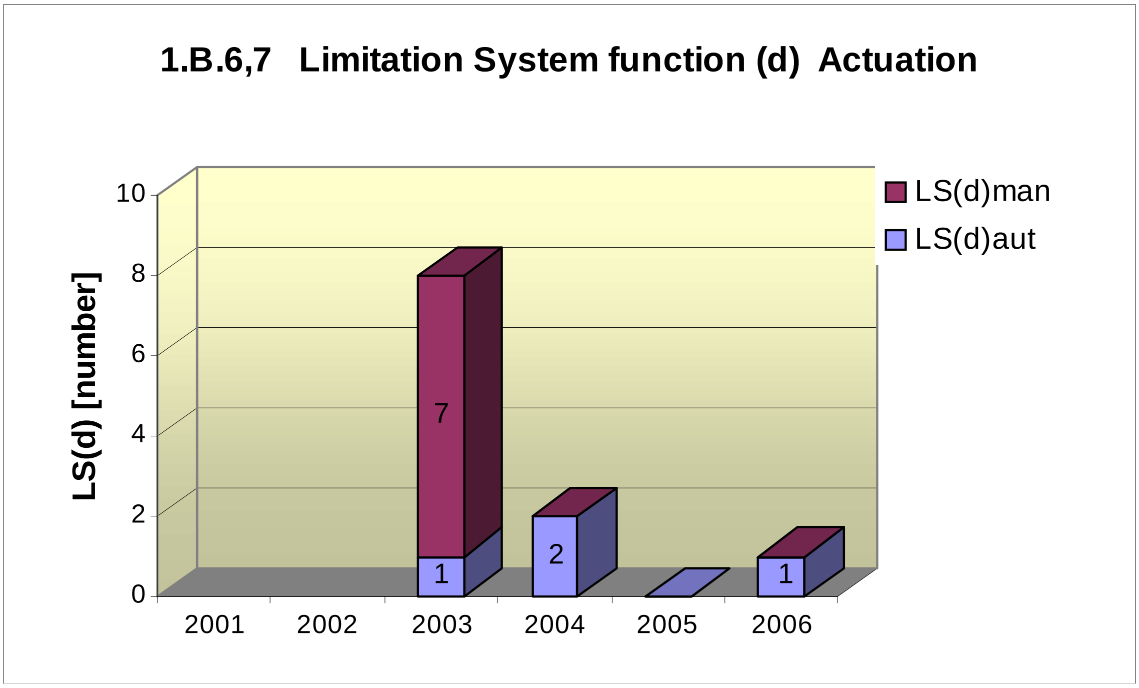
Graph 1.B.1,2 summarises the total number of unplanned unit scrams (US) (reactor in MODE 1 or 2) with resolution of manual and automatic shutdown. The term “unplanned” means that the scram was not an expected part of the planned test.



A common graph of indicators 1.B.3-5 indicates the number of limitation system (LS) incorporation with a, b, c types.

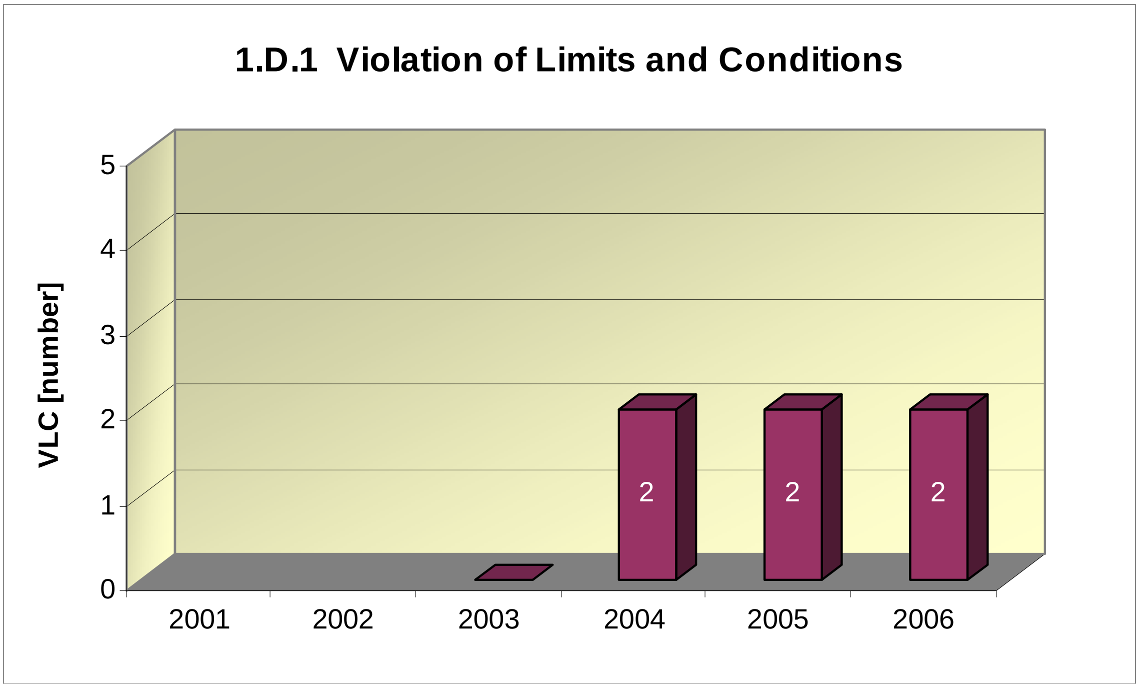


Graph 1.B.6,7 summarises the total number of unplanned reactor scrams with action of the limitation system (LS(d)) (reactor in MODE 1 or 2) with resolution of manual and automatic shutdown. The term "unplanned" means that the scram was not an expected part of the planned test.

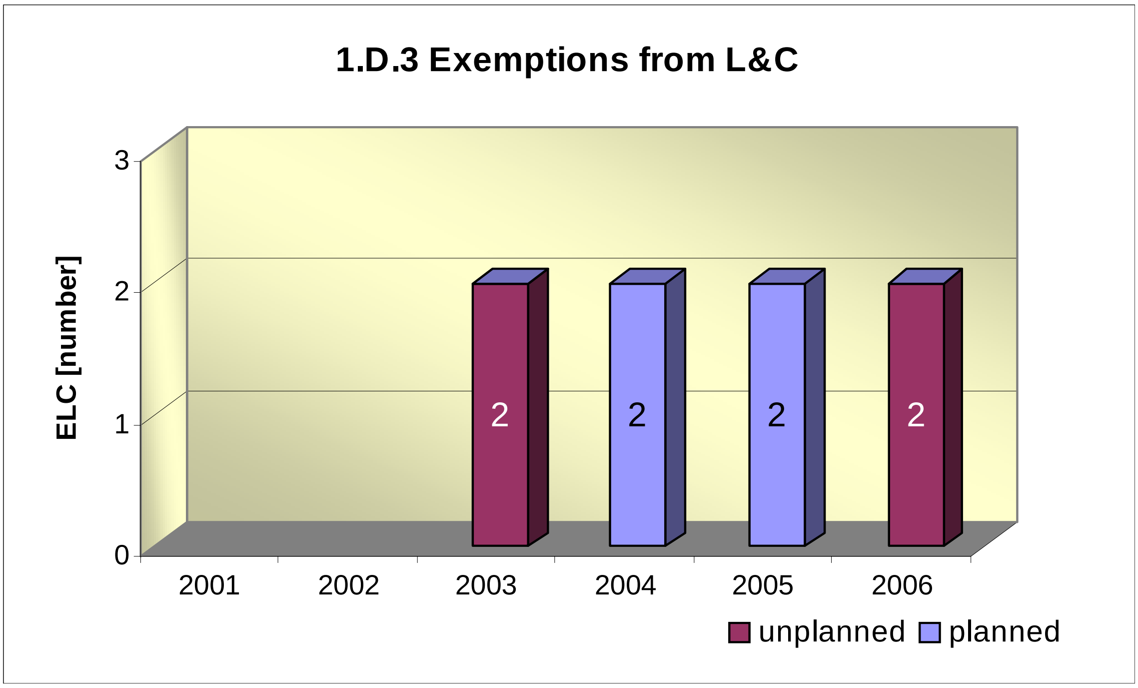


1.D Limits and Conditions

Graph 1.D.1 summarises violations of the Limits and Conditions (VLC) detected by the Regulatory body or reported to the Regulatory body by the licensee.



Graph 1.D.3 summarises the number of planned and unplanned exemptions from the Limits and Conditions (ELC) approved by the Regulatory body including those requiring SUJB approval and however not drawn for various reasons.



2. Safety Systems Performance

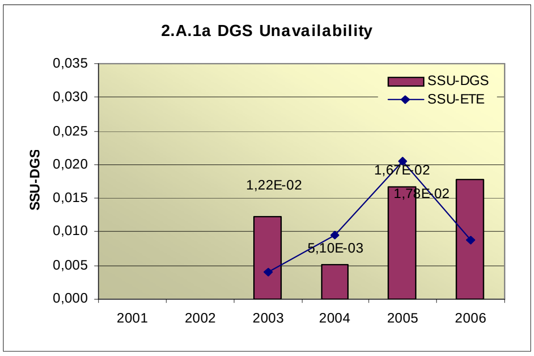
Area 2 monitors and evaluates availability of the following safety systems (BS) in group A:

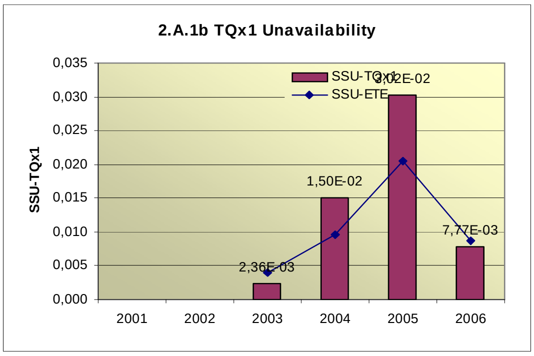
- system diesel generators	**DGS**
- spray system	**TQx1**
- low pressure emergency core cooling system	**TQx2**
- high pressure emergency core cooling system	**TQx3**
- boric acid emergency injection system	**TQx4**
- hydro-accumulators	**HA**
- steam generator emergency feed-water system	**TX**

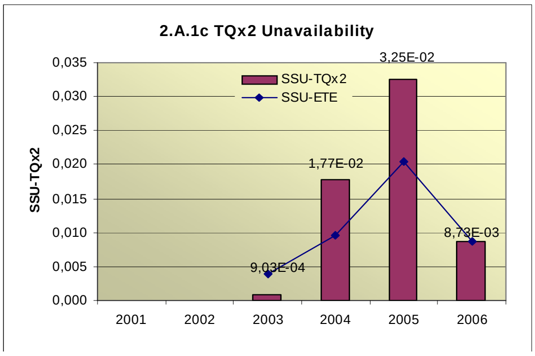
and in group B failure of diesel generator (DG), spray system (TQx1), low pressure emergency core cooling system (TQx2), high pressure emergency core cooling system (TQx3), boric acid emergency injection system (TQx4) in starting and operation.

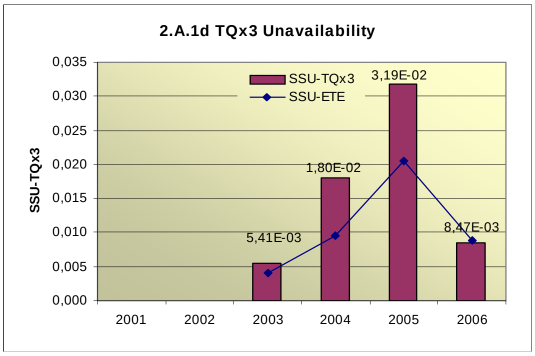
2.A Safety system unavailability

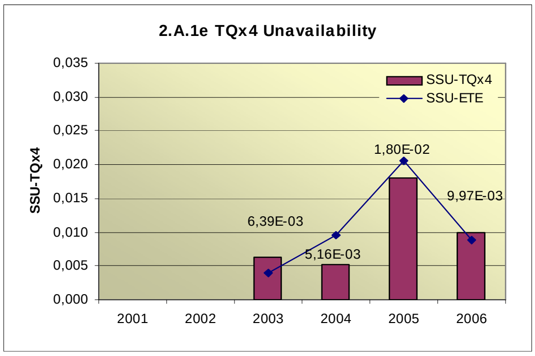
Unavailability of particular safety systems (SSU_S) - graphs 2.A.1.a – g, is defined as the ratio of the total time of unavailability of an evaluated safety system to the total time when its availability was required. In addition, these combined graphs express the ratio of unavailability of respective safety system to the "general" safety system of the site.

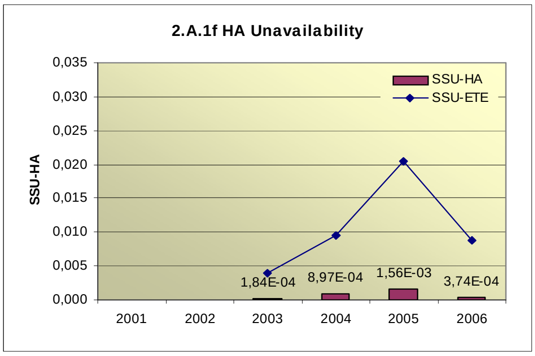


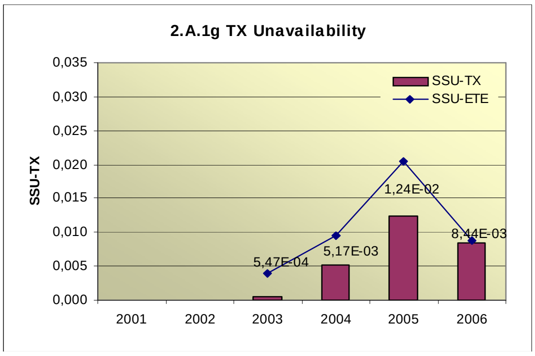






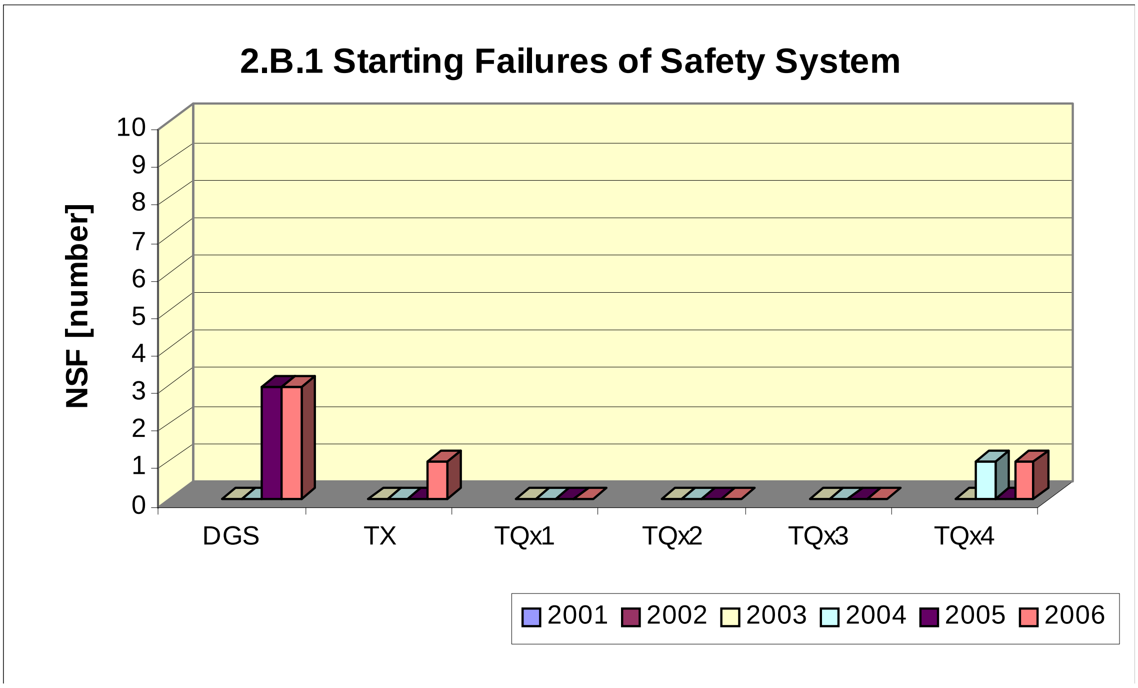




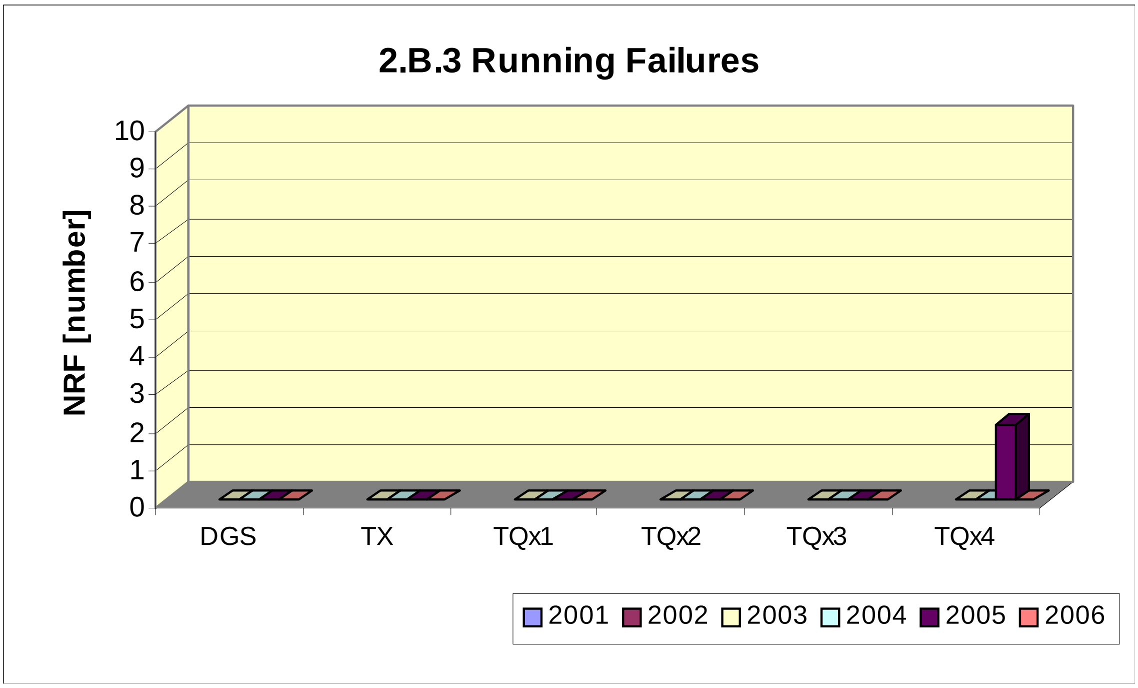


2.B Failure of safety systems

Graph 2.B.1 indicates the number of starting failures of the safety system (NSF), i.e. the state when the respective system, possibly set after the command to start, does not achieve nominal performance characteristic or its failure (shutdown) occurs within 30 minutes after its start.



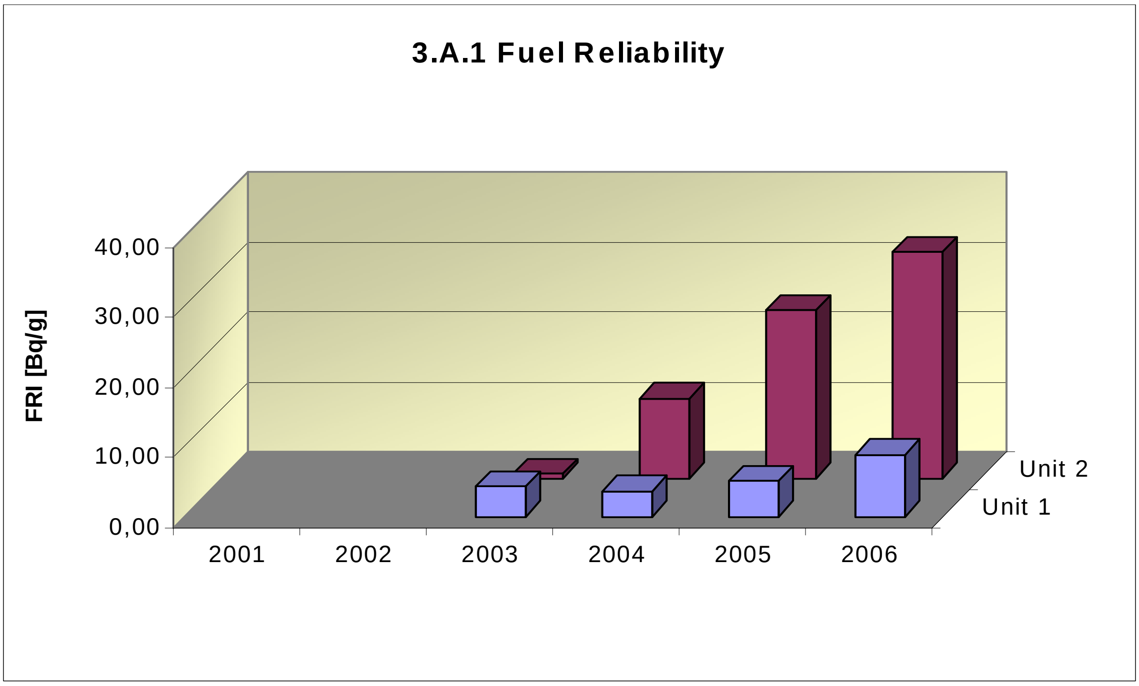
Graph 2.B.3 indicates the number of running failures of safety system (NRF), i.e. the number of states when failure shut down of respective system, drive, possibly set occurs at nominal performance characteristics for the time exceeding 30 minutes since its starting.



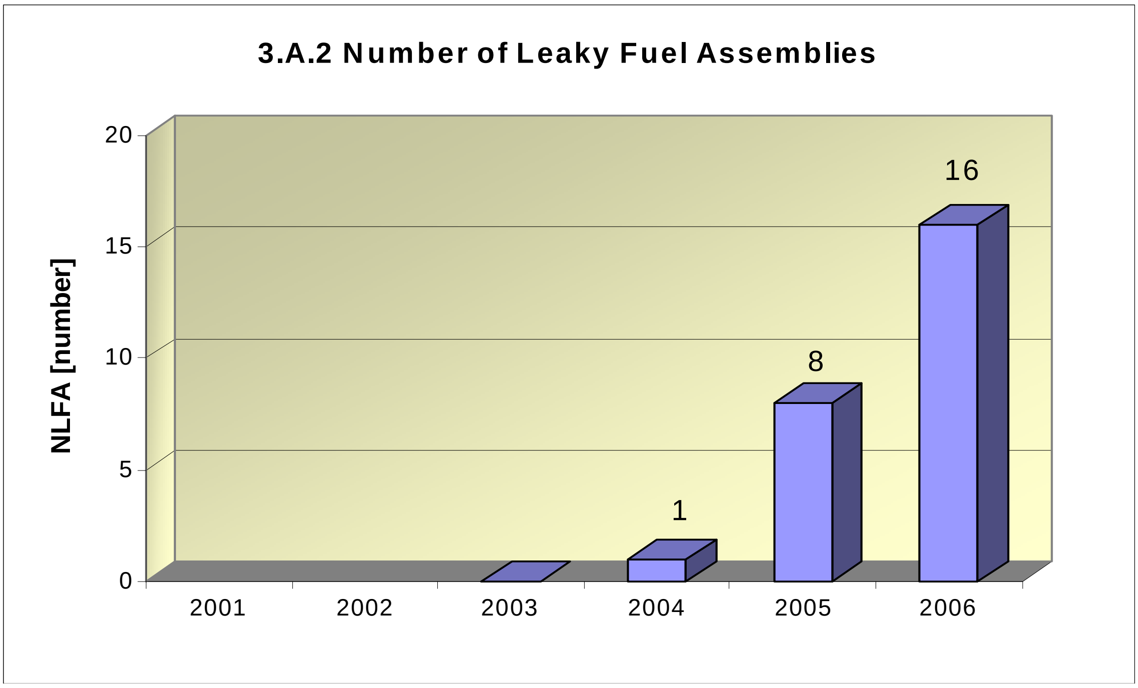
3. Barriers integrity

3.A Nuclear fuel

Graph 3.A.1 monitors fuel reliability of particular units through the values of FRI - Fuel reliability index. The value FRI ≤ 19Bq/g expresses that reactor core most likely does not contain any steady fuel defects.

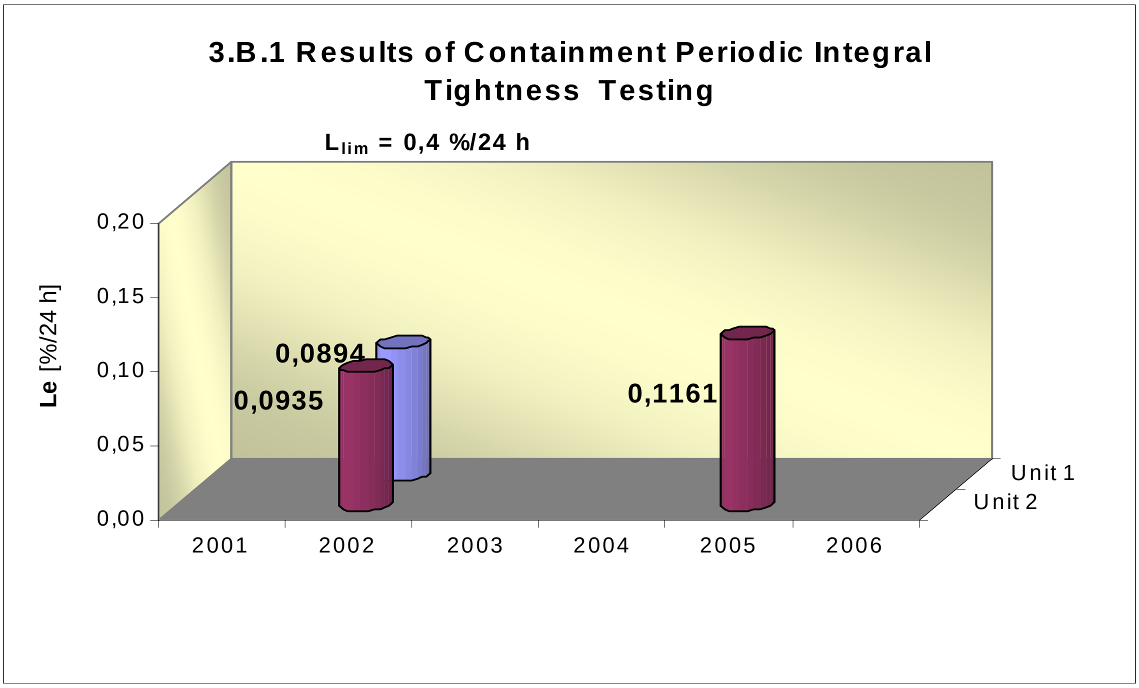


Graph 3.A.2 indicates the number of leaky fuel assemblies (NLFA) that had to be put out of operation due to their inadmissible leakage.



3.B Containment

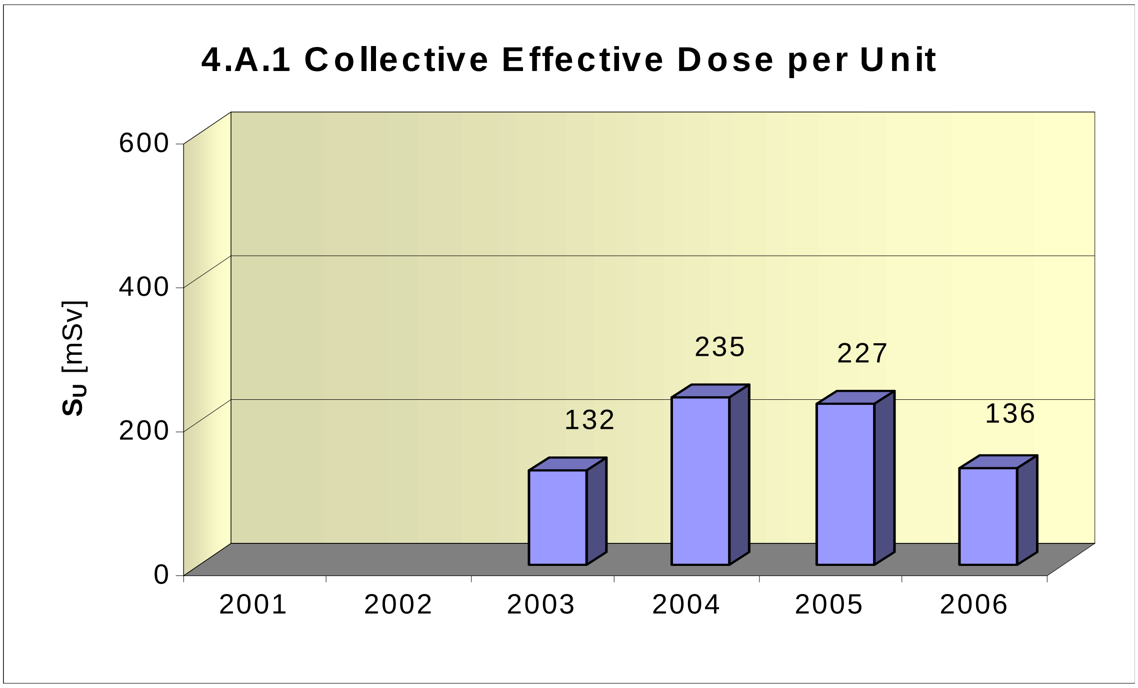
Graph 3.B.1 states the results of Containment periodic integral tightness testing (L_e), i.e. the results of leakage tests of hermetic areas executed by overpressure 400 kPa lasting 24 hours during Containment integrity testing and extrapolated results are stated for Containment integrity repeated testing and Containment integrity periodic testing with lower pressure of 70 kPa and dwell.



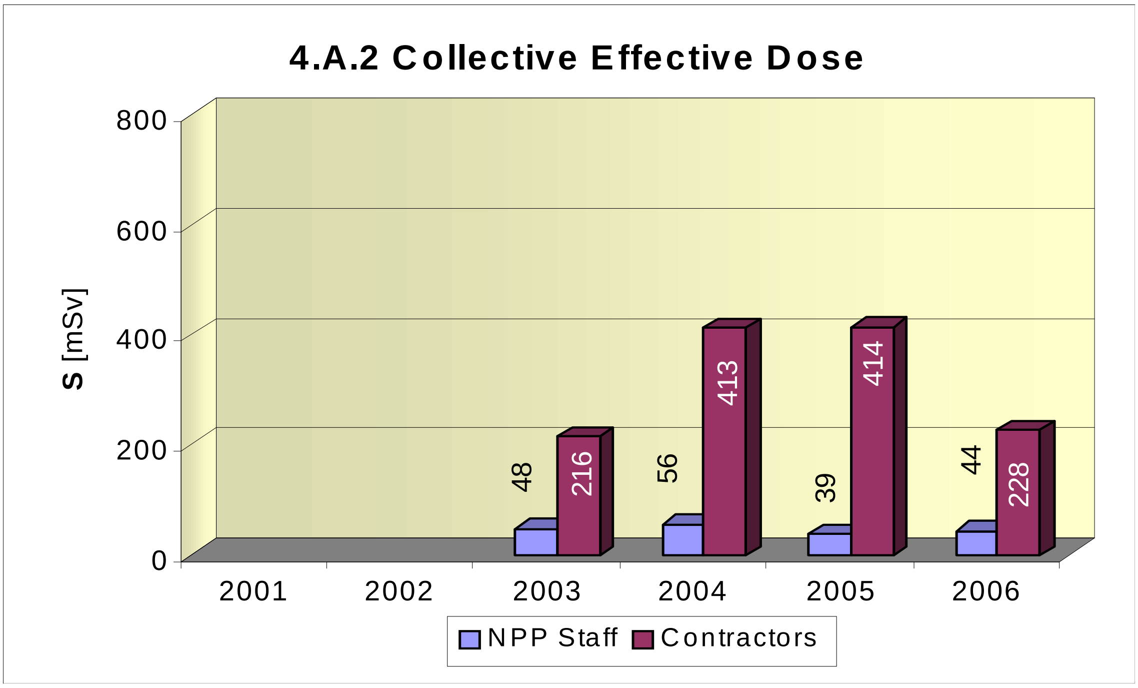
4.Radiation Protection

4.A Staff

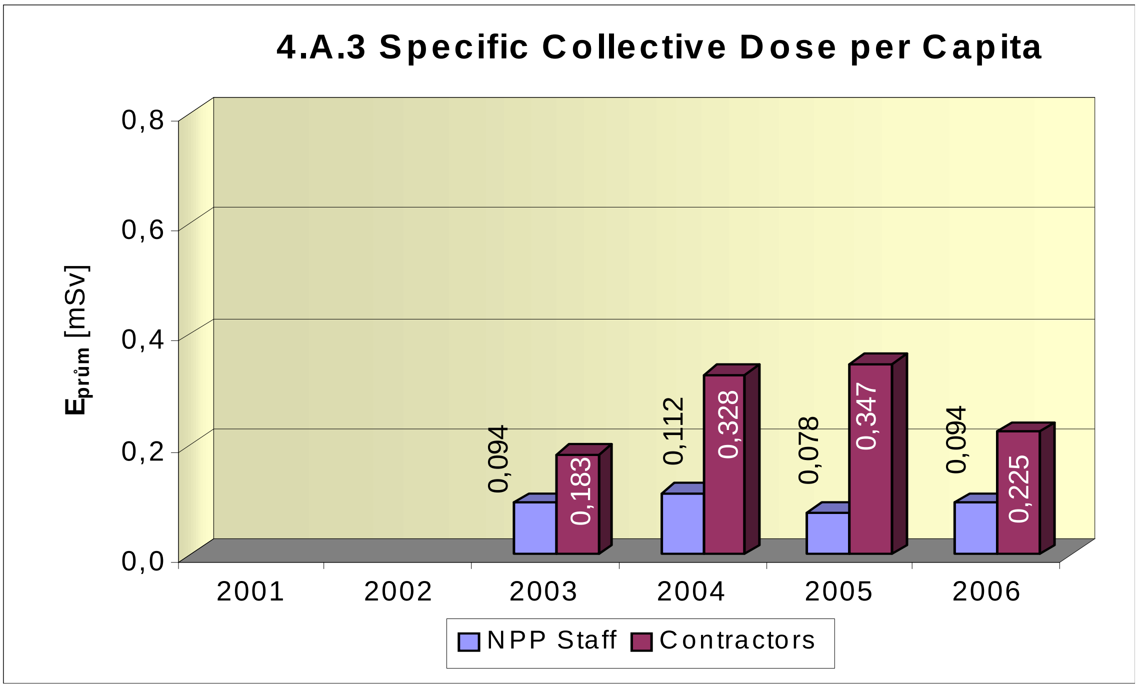
Graph 4.A.1 indicates collective effective dose (CED) received by the staff of NPP (including suppliers and visitors) during monitored period, measured by basic film dosimeters and expressed by mean value per unit.



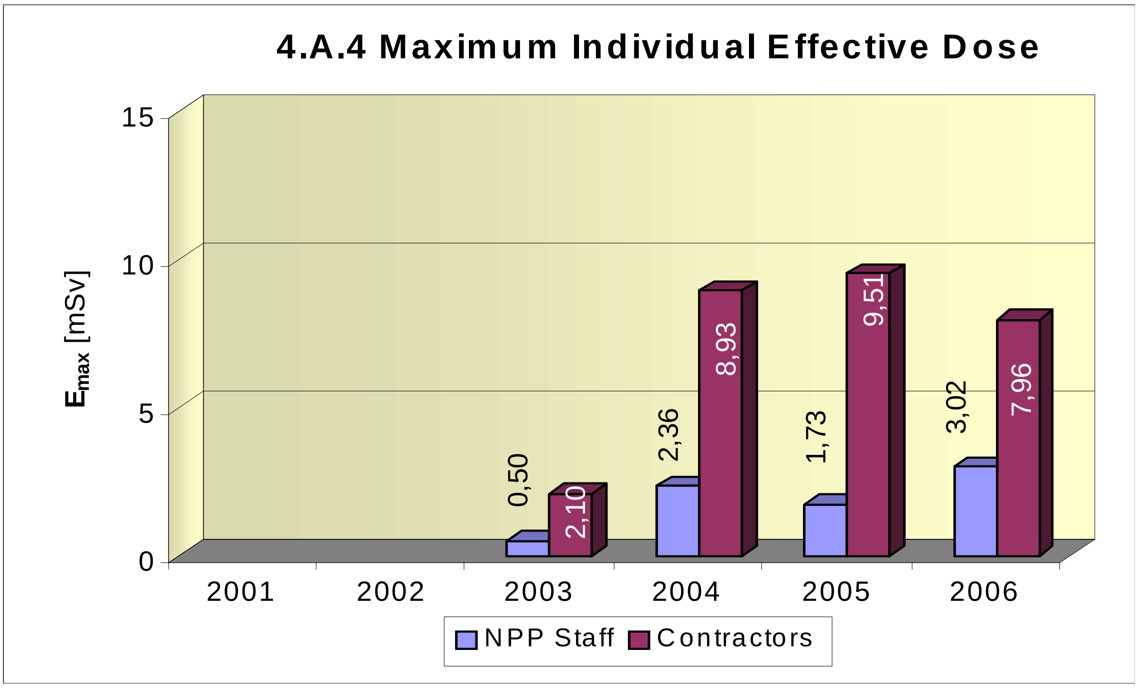
Graph 4.A.2 indicates collective effective dose received by the staff of NPP and suppliers during monitored period, measured by basic film dosimeters.



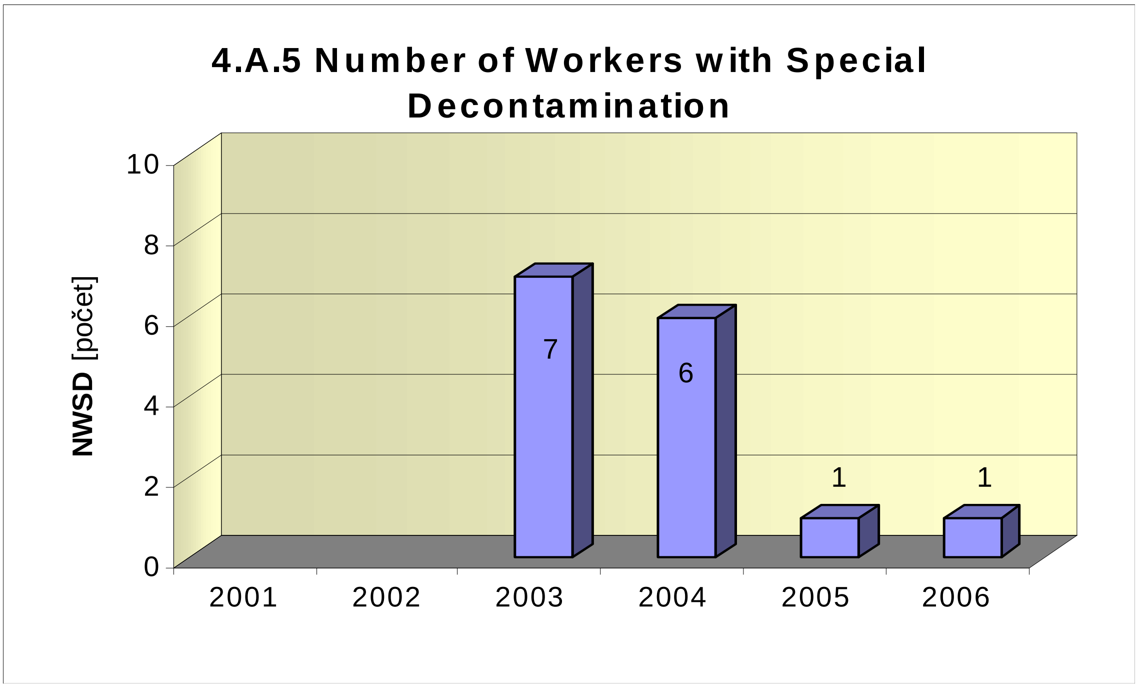
Graph 4.A.3 indicates specific collective effective dose received by the staff of NPP and suppliers during monitored period, measured by basic film dosimeters and express by value per one radiation worker.



Graph 4.A.4 indicates maximum individual effective dose received by one particular employee of NPP and one particular employee of supplier during monitored period, measured by basic film dosimeters.

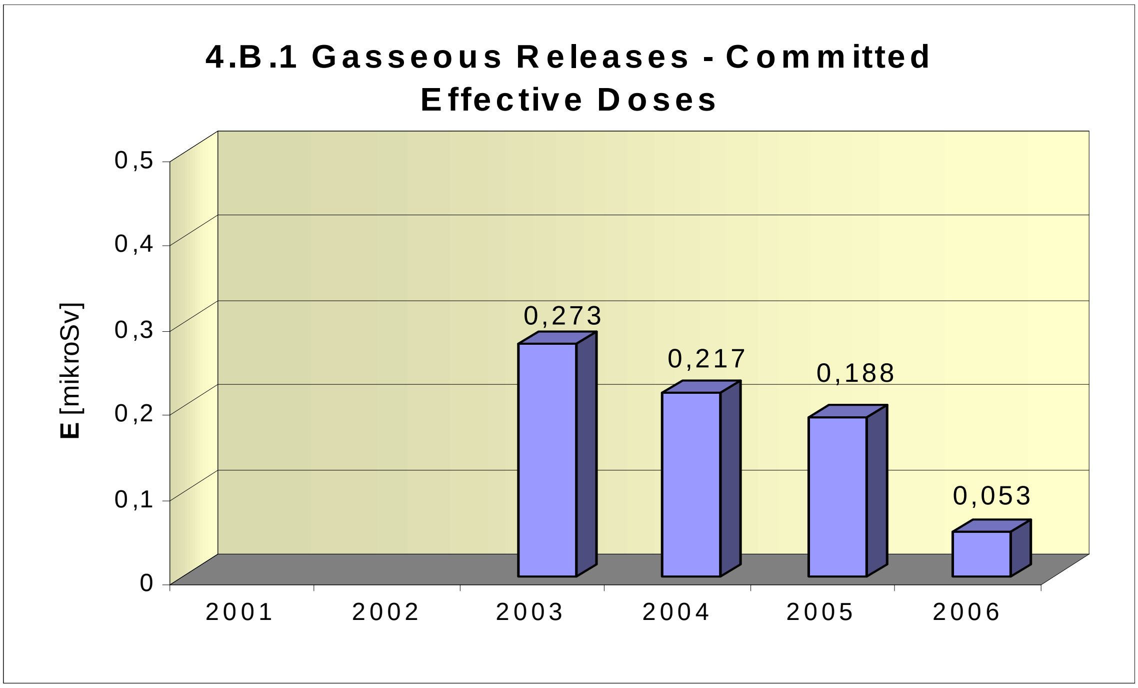


Graph 4.A.5 indicates number of workers (NPP and suppliers) subjected to a special decontamination under medical supervision.



4.B Radioactive Releases

Graph 4.B.1 indicates the committed effective dose for an individual, which arises from radioactive gaseous releases from NPP.



Graph 4.B.2 indicates the committed effective dose for an individual, which arises from radioactive liquid releases from NPP.