Convention on Nuclear Safety

Questions Posted To Belgium in 2017

1	General	II.D.7 Information of the public, pag. 4	About the public enquiries and information meetings: Are they part of a strategic plan of communication? Are they done by governmental requirement and /or public requirement? How are they announced? How often are they done? Is the information communicated only by regulators, or by other institutions? Is there a subsequent follow-up of them? Are the results quantified? Please provide additional information.	According to art. 26 of the Law of 15 April 1994, the FANC has to provide to the public neutral and objective information in the nuclear field. Public enquiries in the frame of the licensing process of high risk facilities are required according to article 6 of the GRR-2001. The license application is send to the local authorities who are in charge of organizing these enquiries. On request of local authorities, the FANC organizes information meeting(s) for the public. The licence applicant may also attend these meetings to give insight into their project(s). The results of the public enquiries are send back to the FANC by the local authorities. These results are communicated to the Scientific Council, which take those into account in his final advice for proposing the license conditions.
2	General	I.C.1., p6	Implementation of all long-term operation as well as all post-Fukushima Stress Test improvements for Doel 1 and 2 units in shortest time possible can be seen as a challenge for Belgium.	
3	General	I.C.2., p7	A thorough investigation of the cracks found in the RPV of Doel 3 and Tihange 2, including the participation of national but also international organisations and not allowing the start-up of the plants before the licensee could	Thank you for your comment

			demonstrate to the FANC that all safety concerns on possible deficiencies of the RPVs have been solved in a satisfactory way, can be seen as a good performance for Belgium.	
4	General	Section I.C.1. c), p6	1) Could you please provide example(s) of the long-term actions that are still to be completed by Tihange 1 for LTO? 2) According to information provided in the previous National Report and answers to questions during the previous review cycle, these actions were to be completed during the 2014 and 2016 outages. What is the current status and what are the reasons for delays (if applicable)? 3) Is the amendment of the licence of Tihange 1 an enforcement measure, i.e. the addition of a licence condition? Could you please provide details?	The LTO action plan for Tihange 1 was divided in 4 major topics: preconditions to LTO, knowledge, competences and behaviour management, ageing management and design upgrades. The two first were due for entering the long term operation of the reactor (september 2015). The ageing actions had to be completed on train S1 during 2014 outage and on train S2 during 2016 outage. The design upgrades have to be performed from 2011 to 2019. Currently, by the end of 2016, the licensee Electrabel is in line with the planning of the implementation of the LTO action plan. The actions related to ageing management (the largest part of the LTO action plan) have been realized. Most design upgrades are already completed: construction of a new full-scale simulator, safety system upgrades, ... The ongoing actions are mostly the design upgrades for the improvement of the fire protection, the construction of a filtered venting system and the construction of a new building for new safety systems. The license has been amended in order to enforce the action plan (as a license condition), and the associated schedule for implementation. (See also answer to question 2)
5	General	Section I.C.3 b), p10	The National Report states (p10) that the application of the new methodology (2007, based on IAEA NS-G-2.10), though successful for Doel 3 and Tihange 2, might not have been efficient	At the time of writing the national report, the new Periodic Safety Review process had already been performed succesfully for Doel 3 and Tihange 2. At the time of answering this question, all units have successfully passed the new Period Safety Review process and the action plan is being implemented.

			for Doel 1 and 2, judging by the defined actions focussing on procedural improvements rather than on an upgrade of the installation. The National Report also states that a more in-depth review of the methodology will be performed both by the regulatory body and the operator to assess its efficiency. 1) What is the practice of FANC/BelV in reviewing PSR, does it involve review and approval of the methodology before the actual performance of the review by the licensee? 2) Is the methodology common for all Belgian plants or specific for Doel 1 and 2? What is the status of the methodology review and of the reconciliation of PSR action plan with the stress test action plan? 3) Is there any impact expected on the schedule of implementation of the NAcP items for Doel 1 and 2 due to their inclusion in a consolidated action plan?	It can be concluded that for all units the defined actions focus more on procedural improvements rather than installation upgrades. The opposite is true for Doel 1 & 2 and Tihange 1, where the LTO evaluation has been incorporated in the Periodic Safety Review process. This LTO-part of the periodic safety review process has in fact led to many upgrades of the installations. The Periodic Safety Review methodology has to be submitted to the regulatory body, i.e. Bel V and FANC, before the study phase starts. The regulatory body evaluates this methodology and has to approve it. With remarks to this approval the regulatory body can influence the study. It has to be noted that the Periodic Safety Review is independent of the Stress Tests, as such the periodic safety review action plan doesn't need to be reconcillidated with the stress test action plan. Doel 1 and 2 were initially scheduled to be shut down in 2015, as such most of the Stress Test actions have been canceled. For the LTO restart of those units, the remaining stress test actions have been included in a consolidated action plan. This consolidated action plan contains the LTO-actions, the periodic safety review actions and the stress test actions. It is clear that due to the scheduled shut down and restart of the LTO-phase, the remaining stress-test actions are somewhat delayed. This is however not due to the consolidation of action plans. This is due to a governemental decision.
6	General	Section I.C.3 c), p10	1) Did non-compliances with Techspecs occur at all Tihange units?	1) Techspecs non-compliance concerned mainly the Tihange 3 unit. The root causes of these non-compliance are howerver not linked to this specific unit as the involved staff was operational on the whole

			2) Did FANC require or did the operator perform an analysis of the causes of the degradation of safety culture at Tihange, as a basis for taking corrective actions? 3) Could you please give examples of the actions proposed by employees to be included in the action plan?	Tihange site . 2) Of course, an in-depth analysis has been performed on the causes of the degradation of safety culture. Beyond the analysis or recent events (that implied enforcement actions from the FANC), old incidents that occured up to 10 years in the past were again investigated by Tihange to be incuded in the analysis. 3) see answer to question 17 here after
7	General	Section I.D.2., p16	Which requirements of the Nuclear Safety Directive (2014/87/Euratom) are not yet included into the Belgian regulatory framework? Are there any challenges envisaged in relation to their transposition or implementation?	Several requirements of the Directive are already included in general terms in the Belgian regulations and/or are practically already applied (for instance periodic safety reviews, emergency planning, . experience feedback, training and qualification, ...) Improvements of the regulatory framework to fully comply with he the Directive will include a.o.: - Safety culture requirements in the management systems - Safety objective for new installations - Natural Hazards (in relation with siting) - Transparency and communication requirements for the licensees These requirements will be included in the frame of the adoption of the WENRA reference levels of end 2014 into the Belgian regulations. This regulatory project has started at the FANC in 2015. The main challenge is the time schedule, and in order to comply with the deadline requirements of the Directive, this regulatory project will be divided in two phases: Short term modifications that aims to ensure on-time transposition of the Directive and (more) longer term modifications with remaining reference levels.
8	General	Section I.D.4, p16-17	As the existing Belgian NPPs have been designed to earlier standards, what would be the	The Belgian NPPs have been built thirty-forty years ago. For design basis accidents, the radiological consequences are limited thanks to the containment. Severe accidents (core melt accidents) were already

			FANC's estimate on their achievement of the new safety objectives? Given the source terms and the results of currently performed PSA Level 2, would the existing plants fulfil the new off-site radiological safety objectives?	considered in the past and several improvements have already been done to improve their prevention and limit their consequences. Nevertheless, large and/or early releases could occur in case of failure of the containment during a severe accident. To avoid such situation, the implementation of filtered containment venting systems has been decided for all NPPs (in the framework of long term operation and as a result of the stress tests). The FCVS would avoid the failure of the containment, limiting at the same time the radiological releases. Belgium is following the 2014/87/Euratom Directive, considering the objectives as reference to define and implement reasonably practicable safety improvements to existing nuclear installations. As no probabilistic quantitative criteria have been associated in Belgium with regard to the safety objectives of the EC-directive, PSA-level 2 results are not used to evaluate if the Belgian NPPs meet these objectives or not. For Belgian NPP, PSA level 2 studies are used mainly to gain insights into the progression of severe accidents as well as to identify possible improvements to their severe accident management programme.
9	General	Section I.D.3, p16	What is the status of the gap analysis on the implementation of the WENRA Reference Levels 2014 performed by FANC and BelV? If results of the licensee's gap analysis are already available could you please provide details on the gaps identified and the possible measures to fill in the gaps?	The gap analysis with regard to the WENRA RLs 2014 is effectively done. The identified gaps concern mainly actions already defined in the stress actions plan but not yet fully achieved. Gaps are mainly in relation with issues E, F and T, for which the safety demonstration has to be better elaborated: a more systematic approach is needed to define the design basis and design extension events&conditions. Spent fuel pools need also additionnal attention in the safety demonstration.
10	General	page 15,	It is stated that "By March 2016,	An action is closed when the effective modification, defined in

		Section I.D.1;	82% of the actions stemming from the action plan are closed. (300 actions out of 366). Among these: • 149 actions are closed with Bel V confirmation; • 84 actions are closed with questions from Bel V to answer; • 67 actions are closed without confirmation or question from Bel V. ” What is the criteria for closing an action with Bel V confirmation, with questions from Bel V to answer and without confirmation or with questions?	agreement with Bel V, has been implemented by the licensee. At that moment, the licensee submits a closure request to Bel V, that evaluates the documents provided by the licensee and makes the on-site verifications, that can confirm the closure or ask questions or request some updates. So an action is closed without Bel V confirmation when the action is under evaluation by the Regulatory Body and closed with questions, when the evaluation by the Regulatory Body led to questions.
11	General	Summary	It has been concluded that 99,75% of the hydrogen flakes are harmless, probably because they are in parallel orientation with the RPV wall surfaces. Did the UT-inspections reveal indications at the areas of RPV support structures which would cause transversal forces and stresses to the PRV vessel wall? In this case also parallel flakes could be more risky. If the answer can be found from the research reports (link in p. 9 to FANC webside), would you refer to them more precisely.	The UT inspections did not reveal indications at the areas of RPV support structures.
12	General	Summary	In the report it is mentioned that	Extensive information can be found on page 61 of the 2015 Safety

			the reference material VB395 with hydrogen flakes showed higher radiation embrittlement rate than expected. Based on further analysis it was concluded that radiation embrittlement of the vessel wall itself is, however, not such a risk. Could you clarify on which basis this conclusion could be made? If the answer can be found from the research reports (link in p. 9 to FANC webside), would you refer to them more precisely.	Cases of Tihange 2 or Doel 3 (http://afcn.fgov.be/GED/00000000/4000/4024.pdf)
13	General	p. 7	On page 7 it is stated that a material containing hydrogen flakes from a rejected AREVA steam generator shell referred to as VB395 showed larger-than-expected irradiation-induced embrittlement. What will Belgium do to improve the understanding of the unexpected behaviour of the material VB395 after irradiation? How can a similar behaviour of the RPV beltline forgings containing flakes be excluded?	The investigations performed in the framework of the RPV issue in Doel 3 and Tihange 2 concluded that the VB395 presents an atypical embrittlement. The analysis concludes that all hydrogen-related mechanisms may be excluded as root cause, showing that the hydrogen flakes are not responsible for the atypical embrittlement of VB395. This conclusion is in line with the results on the flaked KS 02 material, which behaves as expected under irradiation. As, in conclusion, the D3T2 RPV forgings are not expected to show an atypical embrittlement under irradiation such as observed on VB395, Belgium does not plan to improve its understanding of the VB395 behaviour. Considering the VB395 to be an outlier for material behaviour under irradiation, the core shells of Doel 3 and Tihange 2 are unlikely to be more sensitive to irradiation. Nevertheless, as a safety provision, the Doel 3 and Tihange 2 predictive equations take into account the atypical embrittlement observed in the VB395 flaked material. So to be conservative, an additional fluence dependent shift as observed on

				the VB395 material. It is taken as the difference between the observed atypical embrittlement of the material between hydrogen flakes and the embrittlement that can be expected for this material on the basis of the RSE-M trend curve.
14	General	p. 8	It is recognised that these flakes have sufficient margins against growth during normal and abnormal operating conditions as stated on page 8f. How was it proved in a deterministic way that the reactor pressure vessels containing a high density of flakes also have sufficient safety margins under the accidental loading during a pressurised thermal shock (PTS)?	This points is adressed in the Safety Cases of Tihange 2 and Doel 3 on page 92 (http://afcn.fgov.be/GED/00000000/4000/4024.pdf) and in the FANC report on pages 74-75-76 (http://afcn.fgov.be/GED/00000000/4000/4027.pdf).
15	General	p. 8	Will Belgium initiate an experimental programme investigating the behaviour of a vessel wall with a high density of flaws under three-dimensional loading as e.g. under PTS conditions?	No, Belgium intended in early 2016 to launch an international experimental program to investigate the ageing effects - in general - of the reactor pressure vessels. The purpose is mainly to assess the general hyptotheses made for evaluating the structural integrity of a RPV, independently of the presence of flaws. The research program is so not related to vessel walls with a high density of flaws.
16	General	p.150	"According to worldwide experience, hot vessel heads with Alloy 600 are susceptible to Primary Water Stress Corrosion Cracking (PWSCC)." Please show us the methods you	In the original construction of the reactor vessel heads of the Belgian Nuclear Power Plants, the Control Rod Drive Mechanism (CRDM) nozzles (also referred to as RPV head penetration nozzles or RPV head adapters) were made from Alloy 600 material and the CRDM nozzles were welded to the RPV head using Alloy 82/182 weld metal. In the replacement reactor vessel heads, Alloy 690 for base material

			used for investigating the PWSCC resistance of the new vessel heads! Based on what results did you choose the new vessel heads and what material are those made of?	and Alloy 52/152 for weld metal were used. The selection of Alloy 690 (and Alloy 52/152) had been decided initially for the replacement of the Tihange 1 RPV (1999) and confirmed later for the replacement of the Doel 4 and Tihange 3 RPVs. (2015). At the time when the susceptibility of Alloy 600 to PWSCC became a critical issue, extensive programs of research and development were performed, especially in US and France, to understand the mechanism of PWSCC on Alloy 600 and to identify an alternative material that could be used. Alloy 690 for base material and Alloy 52/152 for weld metal were proposed as alternative solutions because the behaviour of these materials under PWSCC was found to be better than Alloy 600 and Alloys 82/182 respectively. In Belgium also, some limited research program was initiated by the Licensee, in particular in the framework of the replacement of the steam generators which had tubes made from Alloy 600. Although the field experience gained from the replacement steam generator tubes indicated the superior resistance of Alloy 690 to PWSCC, the decision of using Alloy 690 for the first replacement reactor vessel head was mainly based on the research and development program performed in France since the replacement RPV head was fabricated by Framatome (now AREVA) which had also fabricated the first replacement RPV heads for EDF. It should be noted that, in addition to the use of Alloy 690 material, other fabrication measures have also been taken to reduce the residual welding stresses in the welds and in the adapters. For the replacement of the RPV head at Doel 4 and Tihange 3, the decision of confirming the use Alloy 690 was mainly supported by the satisfactory field experience gained at Tihange 1.
17	General	Introduction Page 10	The licensee worked on a long term action plan called “Rigueur & Responsabilité”.	After the events of August 2015, Tihange defined several axes including: 1. implementation of urgent corrective actions and short-term actions

			Can Belgium share important attributes of the long term action plan “Rigueur & Responsabilité”. Further, how FANC has planned to assess its effectiveness?	as part of the "Rigueur et Responsabilité" plan. 2. An analysis of the underlying causes behind the events of August 2015. 3. Conducting by WANO a safety culture survey. 4. The conduct by WANO of a Technical Support Mission (TSM) to analyze the events of summer 2015 and the implementation of the "Rigueur et Responsabilité" plan. The root cause analysis and the WANO TSM also highlighted the need to implement longer-term corrective actions to improve the safety culture at the Tihange site. This analysis made it possible to identify, by domain, the root causes leading to the events of 3 August 2015. The long-term corrective actions to reinforce the safety culture are grouped according to the 9 areas as identified by root cause analysis and the TSM WANO. For more details about these domains, please see answer to question 53. The Federal Agency for Nuclear Control closely follows the implementation of the actions and their effectiveness through unannounced inspections.
18	General	VDNS	Please elaborate on the following aspects related to the VDNS: • How do you define ‘a new nuclear power plant’? • How does your national requirements and regulations incorporate appropriate technical criteria and standards to address the objective of preventing	• Building of new nuclear power plants is forbidden in Belgium since the nuclear energy phase out law of 2003 • Section 1.D of the Belgian report gathers the information in relation of the Vienna Declaration. The national requirements on safety are laid down in the Royal decree of 30 November 2011, which includes the WENRA referencel levels of 2008. In complement to the Royal Decree, FANC technical guidance adresses mitigating radioactive release in incident and accident conditions.

			accidents in the commissioning and operation of new nuclear power plants? • How do your national requirements and regulations incorporate appropriate technical criteria and standards to address the objective of mitigating against possible releases of radionuclides causing long-term offsite contamination and avoiding early radioactive releases or radioactive releases large enough to require long-term protective measures and actions? • How do your national requirements and regulations address the application of the principles and safety objectives of the Vienna Declaration to existing NPPs? • Do your national requirements and regulatory framework require the performance of periodic comprehensive and systematic safety assessments of existing NPPs – if so, against what risk/engineering objective or limit are these judged and can you give practical examples? • How do your national requirements and regulations take	• Belgian national requirements already include: - safety evaluations by the regulatory body at the licensing stage (including licensing of major modifications of existing NPPs) (Art. 6 of the GRR-2001) - safety assessments of less important safety-related modifications, with formal approval of the Regulatory Body (art. 23 of the GRR-2001) - the performance of Periodic Safety reviews, that are in place since the startup of operation for all NPPs In addition, Belgium is a member of ENSREG, and participated in the "Stress Tests" safety re-evaluation, and will participate in the 2017-2018 "Topical Peer Review" on ageing management. • The IAEA safety standards are taken into account through the WENRA Safety reference levels that are based on the IAEA standards. In addition, a thorough analysis of the evolution of applicable current norms and standards is performed in the frame of Periodic Safty Reviews

			into account the relevant IAEA Safety Standards throughout the life-time of a Nuclear Power Plant? • What issues have you faced or expect to face in applying the Vienna Declaration principles and objectives to your existing fleet or new build of Nuclear Power Plants?	
19	General	p.6	The legal shutdown of the belgium nuclear power plants will be in the year 2025. Are there any facilities or programs for the definitive disposal of radioactive waste?	A licence application for a surface facility for disposal of short lived - low and middle activity waste has been introduced in 2013 at the FANC. The license is expected to be issued in 2017-2018. Its construction will start shortly after and it is foreseen that first waste emplacement in the facility will take place from 2021. For the disposal of other waste (high level and long lived waste), the national policy is currently under development. For more information, we refer to the Belgian National report for the Joint Convention: http://www.fanc.fgov.be/GED/00000000/3700/3778.pdf
20	General	summary	Could you please explain what are the most important actions that Belgium will take based on the IAEA Fukushima summary report?	The nuclear emergency plan is presently under revision, taking into account the lessons from the Fukushima accident, but also lessons from regular nuclear exercises, experience gained from the management of actual events, radiological or conventional, and international recommendations (IAEA, EU, HERCA, WENRA...). One of the major update in EP&R consider the possibility for everyone on the Belgian territory to obtain, free of charge, iodine tablets.
21	General	IC.1	Could you please give a list of the recommendations and suggestions from the SALTO-missions in	The FANC publishes on its website the final report of the SALTO missions conducted by the IAEA in Belgium.

			Tihange 1, Doel 1&2, including the results of the 2017 mission. The same question for the IRRS mission.	At Tihange 1, the IAEA conducted a pre-SALTO mission in 2012, a SALTO mission in 2015 and a SALTO Follow-up mission end of 2016. The final report of the SALTO mission is available on the FANC website (http://www.fanc.fgov.be/fr/news/mission-salto-dans-le-cadre-de-l-exploitation-a-long-terme-de-tihange-1/734.aspx), summarizing the list of recommandations and suggestions issued by the IAEA in 2012 and 2015 . The final report of the Follow-up SALTO mission will be made available by March-April 2017. At Doel 1-2, the IAEA conducted an expert-mission in 2016 and will conduct a SALTO mission beginning of 2017. FANC published on its website (http://www.fanc.fgov.be/nl/news/doel-1-en-2-slot-van-de-iaea-expertmissie/807.aspx) some details on the finding of the expert-mission and will publish in May-June 2017 the final report of the SALTO mission. The complete list of issues raised during the expert-missions is joined. The FANC also published on its website the final report of the IRRS mission conducted by the IAEA in Belgium end 2013 : http://www.fanc.fgov.be/nl/news/fanc-ontvangt-eindrapport-van-de-irrs-missie-integrated-regulatory-review-service/678.aspx
22	General	IC.3	What is the FANC position on the future application of seismic PSA?	A seismic PSA is currently not yet legally required. The present regulation requires only a justification of an acceptable risk instead of a seimic PSA. This issue will be discussed in the framework of the implementation of the new WENRA (2014) reference levels in the Belgian regulation.
23	General	IC.3	A statement is made that the PSA may not be used to optimise the Technical Specification. Can FANC elaborate on the reasons for that? Is it because it is	In its strategy for PSA applications, the Licensee considers the use of PSA in order to develop risk-informed Technical Specifications as having (very) low or no priority. In particular, the Licensee has stated several times not to seek for TS relaxation by use of PSA.The regulatory body did not insist so far to change this position of the

			considered that the current PSA is not accurate enough?	Licensee. There has been no detailed discussion so far whether the PSA would be "accurate and complete enough" to evaluate and optimize the (complete) Technical Specifications. On the other hand, the Royal Decree of 30 November 2011 requires that "probabilistic safety assessment shall be used to check the adequacy of the modifications made to the power plant, procedures and technical specifications, and to assess the significance of incidents occurring during operation." Hence, on a case-by-case basis, and if relevant, any new modification to some part(s) of the existing Technical Specifications is evaluated by the Licensee by means of PSA. An optimisation of the whole Technical Specifications is, however, not envisaged.
24	General	IC.3	How does FANC determine that the PSA is state of the art? Did you consider an IPSART mission?	The Regulatory Body evaluates the state-of-the-art character of the PSA via its on-line review of all PSA projects (review mainly performed by Bel V). To perform this task, Bel V makes use of international guidelines (e.g. IAEA, NUREGs, ...), and makes an effort to stay informed of the state-of-the-art of PSA by continuous training, participation in international working groups (e.g. WGRISK), participation to international conferences and participation to international R&D projects (e.g. ASAMPSA). Exchanges within other regulatory bodies is also a contributor for maintaining our expertise. So far, an IPSART mission has not been considered.
25	General	IC.3	Please elaborate more on the specifics of the Safety Culture Action Plans	Please see answer to questions 17 and 52
26	General	IC.3	R&D: IVMR is in the research agenda of Electrabel, but seems not to be part of the FANC/BEL V R&D programs; since	The application of IVMR is currently not chosen as severe accident management strategy for the existing reactors in Belgium. The possibility to apply IVMR in the smaller reactors (i.c. Doel 1 & 2) has been examined in PSA Level 2, however external cooling of the

			worldwide more and more small reactors apply IVMR, what are the perspectives for applying IVMR in the existing reactors in Belgium?	reactor vessel was found to be inefficient for the current design. Nevertheless, IVMR is still kept as an 'option under investigation', mainly by following the H2020 IVMR project (Bel V can have access to the results of this R&D program, either directly or via Electrabel/Tractebel).
27	General	general	Could you explain how Belgium has dealt with the challenges of the CNS6 special rapporteur? It is not explicitly mentioned in the report.	The Belgian report does not describe actions in relation with the challlenges identified by the Special Rapporteur in a specific section. However, we think that the full and active participation of Belgium to European activities: ENSREG, WENRA, HERCA, Eu Commission (stress tests) ... that are decribed in different sections of the report fully answers to the issues raised by the Special Rapporteur.
28	General	I.C.1, pages 5-7	As You have described Doel 1&2 units were shutdown and then again approved to startup. Were there any staffing problems during that time, for example staff members (like operators) seeking another job opportunities?	The shutdown project of Doel 1&2 was already being rolled out when the governement allowed an LTO for these units. Despite a retention plan set up as soon as the decision for final shut down was taken, some staff members (including operators) had already left the powerplant, while others had been transferred within the organisation. As a consequence, there was a period at which staffing for Doel 1&2 approached its lower limit. Engie Electrabel has managed however to contract and hire the required amount of personnel to guarantee the continued safe operation of these units and continues to make sure that the required level of licensed personnel is maintained. Beginning of 2015, before the formal political decision was taken to allow a lifetime extension, a huge marketing campaign was set up to recruit 287 new staff members for the Doel site. Today 233 new employees are recruited and the campaign is going on. At the moment, staffing is not a critical problem, but remains a point of attention and lessons learned from this transition period are secured.
29	General	186	What percentage of your NPP's already have a containment	By the end of 2016, none of them. The construction of the buildings and filtering systems are currently ongoing for 5/7 NPPs (not for

			venting-filtration system installed.	Doel 1-2). Their commissionings are planned from April 2017 in Doel 4 to December 2017 in Tihange 1. The construction of the filtered venting systems in Doel 1-2 has been delayed to 2017-2019 in the framework of the LTO action plan of these two units (which were assumed to be definitively shut-down when the FCVS project has been launched).
30	General	72	What percentage of your NPP's already have autocatalytic hydrogen recobiners installed in the containment	7/7 of Belgian NPPs have autocatalytic hydrogen recombiners installed in the containment
31	General	p. 6	Considering this progress report and the results of various inspections and several meetings with the licensee, the FANC issued a positive opinion on the restart of the two oldest Belgian units. They resumed operation on 25 and 30 December 2015 respectively. Q.: Does the NPP Doel perform environmental impact assessment for restarting? Do they need a new license (they were already shut down)?	Although the Doel 1 & 2 units were shut down, their nuclear licenses continued to be valid. These llicenses are not limited in time, nor do they mention a maximum operational life. As such a relicensing of the reactors, on the initiative of the utility, wasn't necessary. To enforce the action plan, FANC however took the initiative to propose an amendment to the existing licences. FANC also did a screening for the need of an environmental impact assessment in regards to the European directive 2011/92/EU. An environmental impact assessment isn't necessary due to the fact that the implementation of the LTO action plan for Doel 1 & 2 doesn't lead to negative radiological consiquences nor does it lead to a significant evolution in the existing radiological environmental effects.
32	General	page 9	PSA development • When is expected to complete the development of the Fire & Flooding L2 PSA for all the Belgian units? • Will they be plant specifc PSAs	The deadline for the Fire and Flooding PSA-level 2 of the NPPs was 01/01/2016 – this requirement was defined in the framework of the WENRA RL 2008. The studies and the results were introduced by the licensee on time, for all units, except for Doel 1/2. After analysis, the studies and the results of the flooding level 2 PSAs, were considered acceptable, including the fact that they have been performed for

			or adaptations of the one mentioned in the report?	representative units. For the fire PSAs, the PSAs were considered too conservative to really reflect the real risk of the units. New deadlines were imposed to the licensee to update the Fire PSAs by end 2017. For Doel 1/2, as it was initially foreseen to definitively close these units in 2015, the studies were not performed by the end of 2015: the best estimate planning is mid-2017.
33	General	page 9	PSA development • Which is the update frequency of the Belgian PSA´s?	Belgian PSAs are updated every 5 years. More precise, an "update" is made every 5 years taking into account modifications to the installations and experience feedback for the data. Then a major upgrade occurs after 10 years. For this upgrade, the PSA-models/methodologies are also improved
34	General	page 10	Periodic Safety review INSAG NS-G-2.10 has been used to perform the PSR of some of the Belgian plants. According to the methodology described in the mentioned IAEA document, standards and good practices must be identified in order to assess every Safety Factor against them. Please, elaborate: • What criteria were used to select these standards and good practices? • Were the type and sources of these standards established a	The selected standards for further consideration in the PSR are those related to the regulations and guides taken into account in Belgium according to the applicability status thereof. A list of 'Good Practices' is established, based upon those that can be found in the databases of the following three institutions: -World Association of Nuclear Operators (WANO); -Institute for Nuclear Power Operations (INPO, US); -OSART Mission Results (OSMIR) Publications which are not relevant with regard to design, operation and management of the unit as well as publications on domains which are out of scope of the PSR framework (e.g. security, safeguard) are discarded. Relevant regulations and standards with regard to design, operation and management were analyzed prior to the PSR. One or several Safety Factors are associated with publications considered to build the update of the regulation framework and to Good Practices as well. Some examples of selected good practices: -INPO OR.4 "Management and leadershipdevelopment"(SF10 and SF12 assessments); -WANO GP ATL 02-001 Control of lifting, rigging and cranes (SF

			priori o defined specifically for each Safety Factor? • Could you provide some examples for some Safety Factors?	10,3,2).
35	Article 6	II.B.1, 21	Regarding the Long Term Operation of Doel 1 & 2, it is stated in the report that the LTO-action plans includes numerous design improvements and ageing inspections and that a new schedule was set up, identifying priority actions that had to be carried out before the start of the first reactors cycle of the LTO-period and setting new deadlines (3 to 5 years) for non-priority actions or more significant design improvements. Could Belgium give more detailed examples of priority actions that were carried out before the restart of Doel 1 & 2 units in 2015 and more detailed examples of non-priority actions or significant design improvements? How does the Regulatory Body ensure that these non-priority actions will be performed during the allowed timeframe?	The short term actions were more focussed on demonstrating that the plant respected its design basis when restarting after 40 years of operation. This included inspection of the reactor pressure vessel and its internals, electric cabinets. However there were also replacements of electric motors of certain pumps, valves and ventilators. The longer term actions include for example the stress-test actions like a filtered containment venting system, for which the procurement period is already several years. The same is true for other design upgrades such as the new fire-extinguishing station or the replacement of the reactor protection system. For enforcement purposes, the Doel 1 & 2 license was amended to include all the actions together with their planning. This license amendment requires the utility to report the advancement of the action plan to the safety authority after each scheduled outage. The Regulatory Body has to give permission to restart the reactor after the scheduled outage, based on a positive evaluation of the advancement report. This is an important tool to ensure that the non-priority actions will be implemented as agreed.

36	Article 6	p. 23	Belgium reports on the effort for the BR2 conversion from highly-enriched uranium to low-enriched fuel. It seems that the development and qualification of the UMo-based high-density LEU fuel will take at least another few years. Is there a deadline when the conversion should be completed? If so, is this deadline specified in a binding regulation? Is the U3Si2-based fuel with reduced enrichment a realistic interim solution for the conversion of BR2?	There is a formal dedication to convert as soon as an acceptable LEU (so <20% enriched) solution is available, which does not imply significant impact on performance and economy of the fuel cycle. There is no binding date defined. Reduced enrichment, but above 20% is no alternative, as the dedication to convert to an LEU fuel would remain as stringent as with the current fuel. The Schumer amendment, sec 134, b, clearly defines the requirement for receiving HEU that no " alternative" being avaible, whereas "the term 'alternative nuclear reactor fuel or target' means a nuclear reactor fuel or target which is enriched to less than 20 percent in the isotope U-235.
37	Article 7	II.C.6	(1) What effect, if any, has the government's decision to phase our nuclear power by 2025 had on the recruitment and training of highly qualified engineers and scientists to ensure the continued safe operation of nuclear power plants and research reactors as well as maintain a talented and effective workforce at FANC and Bel V? (2) Have any special measures been taken?	For FANC and Bel V, the issue of phase-out is an integral part of the reflexions for the strategic plan (10 years) of FANC and Bel V. These reflections will lead to a shift of qualifications of the workforce towards decommissioning and dismantling activities. Specific training programmes are to be put in place to be ready to face these issues according the foresen timeschedule.
38	Article 7.2.1	II.C.6	Considering the Law of Phase-out of Nuclear Energy: Was it necessary to issue new regulations	Yes, a new regulation regarding decomissionning of nuclear installations has been issued in August 2015. A proposal of regulation related to waste and spent fuel storage is currently in the

			or improve the existent, in relation to decommissioning and dismantling of nuclear power plants, as well as radioactive waste management?	final approval stage. These regulations include the safety reference levels of the WENRA's Working Group on Waste and Decommissioning (WGWD)
39	Article 7.2.1	II.C.1	Could you please describe the process for updating, completing or amending regulations?	The process for developing , updating, completing or amending regulation is described in the FANC Management System document ref. PC005-02 and consists mainly of the following steps: • trigger, evaluation and decision of the need for new regulation or modification, extension to existing regulation; • drafting of a regulation proposal by the FANC; • stakeholder consultation (Licensees, general public, NGOs,..); • adaptation of 1st draft (by the FANC); • consultation of official advisory bodies (mainly national High Council for Health and High Council for Prevention and Protection at Work); • final draft; • submission for enacting to the Minister of Home Affairs and advice of the Coucil of State; • signature by the King; • publication in the Belgian official journal.
40	Article 7.2.1	p. 27	European Directive 2009/71/Euratom was amended by the European directive 2014/87/Euratom. It would be appreciated if Belgium could explain the possible impact on The Royal Decree of 30 November 2011and whether Belgium plans to revise this decree?	Several requirements of the Directive are already included in general terms in the Belgian regulations and/or are practically already applied (for instance periodic safety reviews, emergency planning, . experience feedback, training and qualification, ...) Improvements of the regulatory framework to fully comply with he the Directive will include a.o.: - Safety culture requirements in the management systems - Safety objective for new installations - Natural Hazards (in relation with siting) - Transparency and communication requirements for the licensees

				These requirements will be included in the frame of the adoption of the WENRA refrence levels of end 2014 into the Belgian regulations. In this frame, an amendment of the Royal Decree of 30 November 2011 is currently in preparation in view to include the WENRA 2014 safety reference levels in this Decree. More details about this project are given in section I.D.3 of the Belgian Report.
41	Article 8	Section II.D.3 b), p39	Does FANC uses performance indicators, qualitative or quantitative, to assess the effectiveness of its activities? Could you please give some examples?	Within the framework of implementing the management system, FANC has developed a set of strategic KPI's (e.g. % of days spent on training, progress of implementing management system processes). Each process within the management systems needs to develop its set of operational KPI's (e.g. percentage of inspections carried compared to planning, ...)
42	Article 8	II.D.6-a-4, Page 43	It is mentioned in the report: "An internal crisis centre is set up and maintained by the FANC. The FANC and Bel V are jointly responsible for setting up of the procedures, staffing and allocation of resources during emergency situations". Belgium may please provide information about the current staffing and training requirements for dealing with the emergency situations.	The internal crisis centre is not permanently staffed. It can be activated at the request of the authority in charge (i) in case of the activation of the federal nuclear emergency plan and response to provide support and expertise to the federal crisis centre, especially to the evaluation cell, (ii) in case of the activation of a local emergency plan and response to support local authorities and first responders or (iii) to manage radiological incidents that do not necessitate the activation of an emergency plan. When activated radiological, technical ,measurement and communication experts will be convened to gather and analyse the available information, evaluate the potential consequences and impose or recommend action to control the situation and mitigate its consequences.
43	Article 8.1	Introduction, I.C.3.h). - pag. 12	Three main programs are reported as part of an action plan after the IRRS mission in 2013. Further details would be highly appreciated, to expand on the	As a decision of the Belgian government allowed a LTO of Tihange 1 and Doel 1-2, the consequences of the phase-out became less urgent and at the moment have no major consequences on the motivation of FANC and Bel V workforce. Hence no specific actions are taken at this moment. However, within the strategic plan, the issue of phase-

			strategic options being studied for keeping Regulatory Body personnell well motivated and/or the recruitment of young professionals as a consequence of the decision of the nuclear phase out in Belgium.	out still is considered as one of the issues to deal with in the coming years.
44	Article 8.1	p. 39	Will the Belgian regulator certify its quality management system according to ISO9001:2014 in autumn 2017? Can FANC comment on whether the new standard from 2014 will lead to an improvement / revision of the quality management system? How is the management of contractors, like e.g. Bel V or external experts, addressed in the quality management system?	No, FANC decided not to prolong its ISO 9001 certification. However, the management system that is currently developed and implemented is based on the IAEA Standard GSR Part 2 and takes on-board relevant issues of the ISO9001:2014 standard, such as risk analysis and process description.
45	Article 8.1	art.8.1	Many regulatory bodies in the world, face the challenge to transfer knowledge of retiring or senior staff to younger and/or new staff. Is this also the case in your country? Do you have a dedicated program for knowledge transfer and do you provide trainings to senior staff to improve their skills in knowledge transfer?	The FANC management system addresses knowledge management at several places and foresees to implement various processes and tools to share knowledge and expertise in a broad sense inside the organisation. For example, it is mandatory to provide feedback via a short report or communication as a result of international training or workshop. Actually, a dedicated process for knowledge transfer from retiring senior staff is under development. Mention should also be made of the Bel V focus on knowledge transfer from retiring experts to younger staff. A Knowledge Transfer Form is used for this purpose. In addition, we also use a Knowledge Critical Grid that aims to identify and reduce the risk of knowledge loss. Other knowledge transfer tools (such as the 'Knowledge Books') are currently in the

				implementation phase.
46	Article 8.1	IID.3	Changes of the Management System have started after IRRS self-assessment. Have these changes been completely implemented yet? If not, what is the current planning?	The development and the implementation of the management system is on-going. The transfer of the existing ISO quality documentation is progressing as foreseen. The implementation of the new processes within the management system is gradually growing: about 30% of the major documents are available. The current planning foresees to finalise everything by 2019.
47	Article 8.1	IID.8	As far as coorperation with neighbouring countries is concerned, France, the Netherlands and Luxembourg are mentioned. Is there also cooperation with Germany?	Bilateral meetings between Belgium and Germany have been launched in the beginning of 2016. By the end of 2016, ministers from Germany and Belgium signed an official agreement between the two countries that will lead to a bilateral commission, that will take place in 2017.
48	Article 8.1	Page 37	How are Bel V inspectors nominated and what kind of training/exams they need to obtain/pass? Is the qualification process to become Bel V inspector different from process required to become FANC inspector? If so, please describe major differences.	The qualification process to become a Bel V inspector is similar to the process of recognition of health physics experts. Article 73 of the GRR-2001 sets out the requirements that must be fullfilled to be recognised as health physics expert. FANC inpectors as well as Bel V inspector must comply with these requirements. FANC inspectors have additional training requirements dealing with enforcement power which Bel V inspectors do not have.
49	Article 8.1	Para II.D.3	It is mentioned in para II.D.3 of the Report that Belgian Federal Agency for Nuclear Control is funded directly by companies receiving licensing services. Doesn't this compromise regulator independency?	We think that this system is recognized to ensure a good independancy of the Regulatory Body. The FANC is not financed through a State budget, but directly by the licensees by means of: • annual taxes for authorized parties; • administrative fines; • fees paid at the occasion of an application for an authorisation. The amount of the taxes is fixed by article 30bis of the Law of 15

				April 1994, the amount of the fees is fixed by royal decree, as foreseen in article 30quater of theLaw of 15 April 1994; and consequently not subject to discussion with the Licensees nor with the minister in charge of the State budget.
50	Article 8.2	IID.9	When the final decision on NPP license modifications is made by the King, can it still be concluded that FANC is independent in its decision-making? Please explain.	We refer to art 6.7 of the GRR-2001: The final decision is taken by the King, covered by the Minister of Home affairs. However, the FANC proposes the licence conditions; on the basis of the advice Scientific Council. If the advice of the Scientific Council is not favourable, the license cannot be issued. In addition, the advice of the Scientific Council is annexed to the Licence. The only possibility is that a positive proposal from the FANC and/or from the Scientific Council is rejected. In this case, the royal decree has to motivate the final decision. Finally,it never happened since the creation of the FANC (in 2001) that the final decision by the King was different from the proposal of the FANC.
51	Article 9	p. 48	"This authorization sets that modifications of the descriptions included in the SAR are nevertheless acceptable if they improve the safety of the nuclear installations or have no impact on their safety." The meaning of this sentence is not clear. Does this mean that in such cases no assessment / approval / licensing by FANC is required? If not, could you rephrase the sentence or explain the meaning in more detail?	This sentense gives the general principle on the acceptability of a modification, and was written as such in the initial licences of the NPPs. Any modification follows the process decribed in secion II.I.1 c) (page 72 of the report), that comprise a safety assessment from Bel V. In addition, the Licensee has to follow the management of modifications described in art. 15 of SRNI-2011, which is similar to the 2008-WENRA-RHWG reference levels of issue Q

52	Article 9	Page 48	Belgium may please elaborate the mechanism for open and transparent communication with the public.	We refer to section II.D.7 "Information of the public" page 44 of the Belgian national report.
53	Article 10	p. 49 ff.	As reported in the Belgian National Report, Electrabel has a proper system to ensure safety culture at the Belgian NPPs. Has the Belgian regulator or Electrabel identified the root causes leading to the deficiencies in safety culture at the Tihange NPP? How will Electrabel improve the instruments to ensure safety culture at the NPPs?	The analysis performed by Electrabel concluded that nuclear safety was never put in danger but that there was a declining trend in nuclear safety culture. The root causes were a lack of rigor, responsibility and professionalism. Behavioral change was considered a necessary condition to improve the nuclear safety performance and a.o. relates to Leadership and Nuclear Safety Culture, Social Relations, and Learning. The plan to improve nuclear safety aims at by priority reinforcing rigor, responsibility and professionalism at site and fleet level, with a particular focus on Tech Specs compliance and improving nuclear safety performance in general by contributions to behavioral change. The improvement domains and objectives are: 1. Leadership & Nuclear Safety Culture: develop leadership at individual & team level, and intensify attention for nuclear safety culture 2. Processes & Organisation: increase organisational effectiveness 3. Procedures, rules & IT tools: provide stronger operational support by procedures, IT, and rules 4. Social relations: strenghten social relations and dialogue 5. Contractor Management: facilitate and improve quality and efficiency of activities assigned to contractors 6. Technical Specifications: undertake all useful steps to further guarantee Tech Specs compliance 7. Competences & Training: deepen training and knowledge in nuclear safety and boost awareness for Tech Specs 8. Operating Experience & Learning organisation: assure sound event

				analysis and use of operational experience 9. Corporate Oversight: enhance corporate quality of operational support and involvement in fleet performance monitoring The first domain is directly related to safety culture and the corresponding actions are listed hereafter: 1. Leadership & Nuclear Safety Culture Objective: reinforce leadership at individual & team level, and intensify attention for nuclear safety culture Actions at Fleet level • Implementation of workshops Senior Management-Leaders-Teams to share leadership model • Strenghten the leadership training program for new leaders and modules for leaders in place • Intensify communication on Nuclear Safety Culture and regular appraisals • Full integration of specific leadership elements in individual (annual) objectives Actions at Tihange NPP: • Reinforcement of team leadership: aligned vision, cohesion, collaboration, trust • Clarification of leadership roles of SRO & Shift Mgr • Review of observation practice • Execution of NSC survey and WANO Assist Visit TSM
54	Article 11	art.11	How does the regulator assess the sufficiency of human and financial resources at the nuclear installations?	The Belgian regulatory framework requires that the modifications of the licensee's organizational strucure as described in the safety analysis report have to be assessed by the licensee and approved by the Regulatory Body. The way this assessment is done is often based on engineering judgement and comparison with the former organisation. As a matter of fact, the sufficiency of human and financial resources can be evaluated afterwards, looking at

				performance indicators (all the safety related activities are performed in due time,...).
55	Article 11.1	p. 56	In many European countries, operators of NPPs are faced by two facts having an impact on the operator's financial situation: low prices at the stock exchange for electric power and separation of energy production and grid distribution. Can Belgium comment on the situation of the Belgian utilities with respect to the two above-mentioned factors? Does FANC expect any negative consequences for the safe operation of the Belgian NPPs in the future?	Separation between electricity generation and electricity distribution: situation for Belgian utilities Since 2001 the transmission of energy is done by NV Elia System Operator. Elia is responsible to transmit the electricity from the generator to the distribution system. Elia is a legal monopoly and is monitored by a federal regulator. With respect to the financial aspect, the collaboration with the transmission system operator is determined by contracts in which it is clearly determined what the responsibilities of each party are. In case of projects that have a possible impact on the nuclear power plants, it is discussed with the NPP first to find an optimal solution, including the financial impact. Furthermore, in case of incidents resulting from the transmission system, the transmission system operator is cooperating and is transparent as far as it does not strategically favours NPP's compared to other grid users. Next to the sporadic meetings with the transmission system operator on projects or incidents, meetings are arranged to improve the collaboration and awareness of nuclear safety. Since 2003, the energy market is completely liberalized for Flanders (60% of Belgian market). Since 2007 this is also the case for the Walloon region and Brussels (40% of the Belgian market). The distribution of energy is since then done by different distribution grid operators, controlled by the regulator. They distribute the electricity, at the supplier's request, to the end-user. The distribution grid operators are obliged to work with different energy suppliers. The end-user can thus choose its energy supplier. The liberalisation of the energy market has led to more competition between the different energy suppliers. There has never been a monopoly for Engie Electrabel. Before the opening of the market, Electrabel had 80% of the market in Belgium. EDF Luminus having 20%. Since the opening

				of th emarket ENGIE Electrabel has about 35-40%. There are now 45 electricity suppliers. Low prices for electricity at the stock exchange: situation for Belgian utilities Thanks to its diversified portfolio of nuclear and gasfired powerstations and renewable sources (biomass, water, wind, solar), Electrabel can optimize the power portfolio in Continental Europe. Like for every producer, the volatility of the market prices has an impact on the results of the company.By spreading the sale of the expected production on the long term market (this is also called hedging), the risk can be reduced. On average we sell weekly a part of the expected production for the next three years . The exact speed of selling is determined yearly by the management and validated on the level of the Group. For the Belgian market the hedging strategy is also influenced by the low liquidity on the market, since Engie has a big market share and there are not a lot of other buyers and sellers on the long term market. However, nuclear safety is priority nr 1. The Group is investing 1.3 billion in LTO Doel 1&2 and Tihange 1, on top of the yearly capex of +/- 200m€ for both sites.
56	Article 11.1	IIG	What is the long-term national approach with respect to the creation and maintenance of a training and education infrastructure that fulfills the needs of the Belgian parties involved in nuclear safety?	The training and education in Nuclear Science and Technology in Belgium, that fullfils the needs of the Belgian parties (both the nuclear operators and the regulatory body) is mainly ensured by the SCK-CEN. We refer to the following page : http://www.sckcen.be/en/Education_training/Academic Engie-Electrabel has developed a Nuclear Trainee Programme (NTP) for newcomers (executives), as well as a Senior NTP for Engie employees who are willing to develop their career in the nuclear field. The last 10 years more than 700 people passed this specific training program.
57	Article	p. 59	It would be appreciated if	All contractors must follow an 4 days initial training and pass a

	11.2		Belgium could share the information about the extent of the contractor training and qualification performed by Electrabel.	theoretical and practical exam before accessing the installations. The training covers the following topics and provides the basic knowledge to be able to perform an intervention safely. : • Short explanation on how a PWR works • Nuclear security • Nuclear safety and safety culture • Intervention process • Quality assurance • Risks (H&S, fire, earthquake….)and protective measures • Personal Protective Equipment • Foreign Material Exclusion • Emergency Preparedness • Environment (including waste segregation) • Human error reduction tools • Labelling code for equipment and rooms • Radiation protection The last day of the training is organized in a human performance simulator. Contractor trainees must put into practice the fundamentals (nuclear safety, environment, health safety…expectations) seen before: follow the dressing code to enter the RCA and perform a simple technical work in an environment that is a replica of technical rooms and equipments we can find in the RCA. They are evaluated on the respect of safety rules, use of human error reduction tools, RP, questioning attitude, safety communication, prudent approach…
58	Article 11.2	p. 60	In the Belgian National Report, it is stated that in the case of research reactors, the health physics and safety department nominates the reactor manager. Could Belgium explain how the reactor managers for NPPs are	The safety analysis report (SAR) for NPP includes qualification requirements for positions involved in safety related activities (including reactor managers). The RB verifies that these requirements are met (such is the case prior to the nomination of a reactor manager). The case being, deviations may be accepted based on justification file submitted by licensee to the regulatory body for approval. For some positions explicitely mentioned in SAR, a

			nominated? Could Belgium further elaborate on the role of FANC / Bel V in the nomination process of reactor managers?	specific exam has to be passed by the applicant in front of an evaluation committee composed of licensee representatives and regulatory body representatives.
59	Article 11.2	IIG.1b	The report mentions: "Major safety upgrades ... [...] are financed by annual provisions (1/10 each year)". Could you please explain in more detail how this financing is organized? Can you explain one tenth of what is meant? Is there a kind of fund? Are the modifications limited to what has been provisionally saved?	With each Ten-Yearly Review (PSR), provisions are made for the next 10 years. 1/10 of this budget is allocated to each year. This is not a strict limit however and important modifications with a positive influence on nuclear safety or any other important improvement, will be executed. This not only means that the budget for a specific year can be exceeded; even if the costs would surpass the provisions for the total period of 10 years, the modifications will always have priority over any cost considerations.
60	Article 12	Pag. 62 / 64	It is very interesting the establishment of human performance improvement plans and the use of human error reduction tools. Could you please indicate how to measure the objectives and results of these plans? Which is the percentage of decrease in human failures?	Electrabel-ENGIE use several indicators: number of task observations, number of people who succeed in the training 'HU coach', number of deviations (management expectation not respected) reported per category…. Three main indicators provide a global picture: the HU clock (reset of the day count, each time an event is caused by human error and two performance indicators), the HU Index (number of deviations with HU root cause pondered with their importance between 1 and 4) and the HU ratio making the ratio between the number of events in category 1 (most important) or 2 compared to category 3 and 4 (less important). This last indicator monitors the trend in reporting HU events. They are used worldwide (more info can be found in INPO guidelines) and allow to benchmark us.
61	Article	II.H, 63	The use of subcontracting may	Currently the Belgian Licensee, Electrabel, follows his own interal

	12		have an impact on organizational reliability and safety. New regulations in France now provide that (a) major safety related activities can only be performed by first or second tier subcontractors and that (b) the control of NPP operation, including analysis of incidents of safety related findings, and emergency preparedness and response matters cannot be dealt by contractors or subcontractors. Is there any requirement in the Belgian nuclear regulation that aims at a better control of contractors and subcontractors activities at NPP sites? Has subcontracting been identified as a potential issue regarding nuclear safety?	procedure that limits the subcontractors cascade. This procedure indicates that a contractant can have only one level of subcontractor, unless for very specific cases or huge projects.
62	Article 12	IIH.1 and 2	Improvement plans for the years 2010-2012 are mentioned. What were the developments in the reporting period?	The HU development program during the reporting period (2013-2015) has been defined at department level. A summary list of actions is provided herewith : Maintenance Departement: - Improve the work preparation - Increase work supervision (control quality level 1 by peer) - Clarify role and responsibilities in maintenance (common maintenance services for the site – specific maintenance services for each nuclear reactor unit) Operations department :

				- Reinforce the leadership role of shift supervisors (evaluation of team members performance during simulator training, team self-assessment based on WANO SOER 2013-1 Operators Fundamentals) - Training and qualification on Operations fundamentals Care Departement : - Care Radiation Protection : Define clear criteria for formalized pre-postjob briefings + film on PJB and secured communication for training - Care Radiation Protection : Coaching first line managers to reinforce management expectations during Daily meeting - Care : Task observations focused on use of HU tools - Care Nuclear Safety : Develop Control quality level 2 related to HU tools Engineering : - Clarification of interfaces with Maintenance - Long Term Operation Tihange 1 : creation of Program Support Office for better integration of good practices, planning and management of workload Fuel : - More task observations - Training on use of fuel handing tools and machines - Update procedures In 2015, due to events related to personal responsibility, rigor, questioning attitude and conservative decision, a plan has been established to change the safety culture of all employees at the Tihange NPP. The licensee worked on a long term action plan called "Rigueur & Responsabilité". Final evaluation of the plan is awaited by the end of 2018.
63	Article 13	p.70	In 2010, FANC and Bel V asked the licensees of nuclear facilities (including the NPPs and RRs) to	The Royal Decree on the safety requirements for nuclear installations was published on the 30 November 2011, before the issue of the IAEA GSR part 2. Article 5 of this royal decree describes the

			perform a gap analysis between their management system and the requirements of the safety guide GS-R-3. Q.: Do you have similar plan with IAEA GSR part 2 which supersedes GS-R-3?	regulatory expectations with regards to the management system. This article reflect the 2008 WENRA reference levels that are mainly based on the safety guide GS-R-3 and is currently the binding regulation that nuclear operators have to comply with So far, there is no planned gap analysis with the safety guide GSR part 2.
64	Article 13	page 68	Quality Assurance Have you regulation for elements important to safety, yet non safety-relate.? If not how do you regulated? Are those elements listed in the Q-List of the NPP´s with any indication o requirement?	In Belgium, we do not use this distinction: only SSCs “importants pour la sûreté” – sometimes translated as “safety related”, sometimes as “important for safety” are defined. The regulation (SRNI-2011)asks for their classification : “All structures, systems and components important to safety, including Instrumentation & Control software, shall be identified and classified according to their importance for safety”. For the new ultimate additional means installed after the Stress Tests, a new specific class has been defined, with specific requirements associated to this new class. These requirements have been discussed with the safety authorities. The Q-list gives an overview of the classification and required qualification level of all safety related SSC's installed on site.
65	Article 14	p. 74	Belgium reports that “The installations of the SCK•CEN are also subject to periodic safety reviews. Previously, the reactors BR1 and BR2 had to undergo a 5-yearly safety review according to the licence for operation of the SCK•CEN installations. In 2003, the periodicity of the safety reviews was changed by royal decree to 10 years for all the SCK•CEN installations, as is the	1. The FANC changed his approach on PSR and issued new guidance (which now recommend the use of SSG-25): - the PSR exercice had to be a more in-depth review - 5 years was too short for an in-depth review, many actions of the preceeding PSR were not completed at the upcoming PSR, and consequently delayed to the next PSR - this also allowed a better closure of the actions plan and avoided overlap on PSRs 2. Yes, the PSR includes all 14 safty factors of IAEA SSG-25. The PSA assessment of BR2 was not updated at its last PSR, based on a justification of the Licensee.

			practice for nuclear power plants. The current (2016) periodic safety review is based on IAEA SSG-25." It is a quite unusual tendency to increase the periodicity of safety reviews with increasing age of the facilities. What are the reasons for this decision? Does the periodic safety review for research reactors include all 14 safety factors given in IAEA SSG-25, also including a complementary probabilistic safety analysis?	
66	Article 14.1	II.I.1 NPPs, pag. 71	It is explained that the SAR of the older units (Doel 1 & 2 and Tihange 1) were rewritten "although minor deviations from the standard table of content of RG 1.70 exist". Are these minor deviations related to specific reactor design, and if not why are there any differences? Please provide additional information.	Cases of deviations from RG 1.70 are: chapter 3.B, documenting the positions taken on NUREG-0737 (post-TMI actions); the insertion in 1992 of a chapter 3.6 "Protection from external hazards" created in the frame of the first PSR of DOEL 1&2; the adoption of the French layout for the Tihange 1 Technical Specifications (still as chapter 16, but completely different structure); the addition of a chapter "0" for Tihange 1 summarizing peridoc safety reviews and reactor power increase following steam generators replacement.
67	Article 14.1	II.I.1 NPPs, pag. 71	It is mentioned that the table of contents of the SAR was recently extended. Does it include the post Fukushima lessons learned? Please provide additional information.	It has been convened in the framework of the Stress-Tests action plan that a new chapter will be added to the SAR for the description of the new equipments (Ultimate means, CSBO means…). These chapters are now under redaction by the licensee. For the improvements of existing SSCs, the modification process includes an update of the SAR.

68	Article 14.1	p. 71	From the objectives of the PSR described on page 71, one might get the impression that maintaining a certain level of safety is prioritised. It would be appreciated if Belgium could clarify that continuous improvement according to the Vienna declaration is considered as the highest priority.	Continuous improvement receives the highest priority, but this has to be done continuously and independently from the periodic safety reviews. The periodic safety review is a global evaluation in order to demonstrate that the same level of safety has been at least maintained during the period between two periodic safety reviews (10 years). Furthermore, a comparison to the most recent safety regulations and practices is performed. This comparison, together with the conclusions of the global evaluation, should practically speaking always lead to improvements. The conclusions of this global evaluation, taking into account the proposed improvements, should justify the unit's further safe operation.
69	Article 14.1	p. 72	On page 72, it is stated that in case of a major modification, a new licence has to be granted and signed by the Minister of Home Affairs and the Belgian King. After the licence has been signed, the licensee holds a valid and legally binding licence to perform the modification. Why does the Health Physics Department, an internal organisation of the licensee, have to authorise the implementation of the modification?	The Health Physics Department, does not authorise the modification itself a second time, but the practical aspects of the implementation of the modification in the installation(s) : work procedures, preliminary training, radioprotection, incident management, ...
70	Article 14.1	Section II, para II.I.1	It is stated in paras I.C.3 and II.I.1 of the Report that probabilistic safety assessments have been performed for Belgian NPPs.	Please see pages 73 and 100 of the Belgian national report: PSAs studies cover level 1 & 2 PSAs for internal initating events and internal fire and flooding. Spent fuel pools are not included in the scope.

			What was the PSA scope? What are probabilistic estimates obtained as a result of PSA?	
71	Article 14.1	p.71	More recently, the table of content of the SAR was extended: • To include a new section (in Chapter 3) on the Probabilistic Safety Assessment performed for that plant (a consequence of the periodic safety reviews). Q.: What are the contents of the PSA chapter/section? According to which standard or guidelines the new content was prepared?	The different steps of the elaboration of the PSA models are described in this chapter. The considered plant operating states, initiating events and the databases used are listed. Finally, the results are given. In addition and following the WENRA requirements and the associated Royal Decree of 30/11/2011, a list of the most important equipment (High Safety Significant components) will be in the near future also included.
72	Article 14.1	p.73	Replacement of technologically obsolescent systems (instrumentation and control systems) addressing software qualification issues. Q.: Do you have safety related components with software and according to which standard the software qualification was performed?	Among the I&C systems that need to be replaced because of their obsolescence, there are computer based systems that perform important to safety functions. Such systems performing Category A functions (in the sense of the IEC 61226) have to comply with the requirements of the IEC 60880 and of the "Common position of international nuclear regulators and authorised technical support organisations" published by Bel V, BfS, CNSC, CSN, ISTec, ONR, SSM and STUK.
73	Article 14.2	-	As mentioned in the report, for Tihange 1, Doel 1 and Doel 2 a PSR with a Long Term Operation (LTO) scope according to IAEA	The licensee Electrabel duly followed the IAEA safety guides for the LTO of the three concerned units (Tihange 1, Doel 1 and Doel 2). SALTO missions have been conducted by IAEA in 2012-2015-2016 in Tihange and are ongoing (2016-2017-2018) in Doel. In Tihange,

			safety guide was developed and a LTO-action plan was determined. Are the Ageing Management Programms (AMPs) and Time Limiting Ageing Analysis (TLAAs) going to follow the IAEA Safety Report No. 82 guidelines? Is the Equipment Qualification Programme already in place? Is it implemented or is going to be implemented an Obsolescence Programme? Please provide additional information.	the IAEA SALTO mission concluded that the LTO Program is fully in line with IAEA standards. The licensee Electrabel follows the SR-82 guidelines for the AMPs and TLAAs. In particular the Equipment qualification Programme and an Obsolescence Programme exist.
74	Article 15	Table 8, pag.79	The report shows the impact of release limits, but it says that "the total maximum is not the sum of the dose due to the gaseous release and the dose due to the liquid release". What does correspond to the total maximum? Please provide additional information.	The total maximum corresponds to the maximum of (impact of gazeous release + impact of liquid release) and not of (maximum impact of gazeous release) + (maximum impact of liquid release) because the most exposed individual by each type of release does not belong to the same age category
75	Article 15	Pag. 80	It was mentioned that "the releases that took place effectively are only a few per cent of the limit values, except for tritium where the limit values had been chosen based on the operational experience of similar plants". Could you explain the difference in the choice of the limit values of	The initial release limits were determined according the US rules 10 CFR 50 appendix I (design criteria) and 40CFR190 (ALARA aspect). In 2001, the GRR-2001 transposed the European Directive 96/29/Euratom into the Belgian regulation. Following entry into force of this Decree, the radiological impact of the existing release limits of the NPPs were reevaluated according the new dose definition, the new conversion factors, and some improvements in the calculation methodology (consideration of additional radionuclides, review of

			tritium and other radionuclides? What were the criteria used to establish the limits of the other radionuclides?	pathways, integration of local habits, ..). As the newly calculated radiological impacts were found acceptable (well below 1mSv/y) and in line with international practices, the release limits (Bq of specified nuclides) were not modified.
76	Article 15	II.J, 76	Could Belgium provide the reference levels that would be implemented in case of a nuclear emergency (radiation doses that would imply sheltering, evacuation, or ingestion of stable iodine tablets)?	Protective action Intervention guidelines as stated in the regulation in force: - General sheltering (for 24hr maximum) 5 — 15 mSv (total effective dose integrated over 24hr). - General evacuation (except special groups, to be defined) 50 — 150 mSv (total effective dose integrated over 1 weeks, sheltering not accounted for). - Stable iodine - for children (< 18 y, pregnant and breastfeeding women) 15 — 50 mSv (thyroid equivalent dose from inhalation during passage of the cloud, sheltering not accounted for). - for adults 50 — 150 mSv (thyroid equivalent dose from inhalation during passage of the cloud, sheltering not accounted for). In the revised version of the EP&R (still to be approved), the guidelines will be limited to providing the lowest value of the range for each protective action, considered as generally justified.
77	Article 15	II.J.3. (b) (5), Page 79, Para 2	It is mentioned that "During the last years, additional effort was set on the avoidance of search dose starting from the statement that a significant part of the workers exposure came from the initial step of just finding the equipment(s) on which one has to intervene". Belgium may like to provide the details of these	The operator uses a software package to keep track of the dose rate range in each room of the RCA. Videos and photos are also taken and are available when preparing the work to help locate equipment more quickly once in the RCA.

			additional effort.	
78	Article 16	Section II.K.2 a), p84	The 4th notification level, NR or “reflex” level is defined to cope with “fast kinetics” events. Who will decide that an event is of “fast kinetics”? Also how would it work in case an accident is occurring outside Belgian territory? Would the plants in the vicinity (Borssele, Chooz B, Cattenom and Gravelines) be aware of special requirements for such events? Further, how the “reflex” zones would be defined for a) Belgian plants and b) plants outside Belgian territory?	Events leading to a notification level “NR” include, by definition, all events leading or likely to lead to population exposure that exceeds any intervention level (for sheltering, ITB or evacuation) within less than 4 hours. The radius was calculated based on the accidents scenario's specific for each Belgian reactor and their associated consequences (total effective dose or thyroid equivalent dose) after 4 hours. For NPP's the maximum value of the reflex radius (3.5 km) is driven by the thyroid dose for the 1 year child. The accident scenario's responding to the definition of the reflex phase were identified and EAL's and generic criteria (e.g. complete loss of the cooling, effective or supposed damage to an nuclear building, exceeding given radioactivity releases limits at the stack) were defined that will automatically lead to the declaration of a 'reflex' notification by the licensee. Applying the principles of the reflex phase to neighbouring NPP's and the reflex radius of 3.5 km only the French Chooz NPP must be considered. However, the extent of the reflex zone on the Belgian territory is very limited and covers only uninhabited forest areas.
79	Article 16	II.K.2.(a), Page 84, Para 1	It is mentioned that automatic protective actions are defined within a predefined reflex zone to cope with events of fast kinetics. Belgium may like to inform that what is the basis for determining the radius of this zone and how it is different from precautionary action zone for which protective measures are implemented.	Events leading to a notification level “NR” include, by definition, all events leading or likely to lead to population exposure that exceeds any intervention level (for sheltering, ITB or evacuation) within less than 4 hours. The radius was calculated based on the accidents scenario's specific for each Belgian reactor and their associated consequences (total effective dose or thyroid equivalent dose) after 4 hours. For NPP's the maximum value of the reflex radius (3.5 km) is driven by the thyroid dose for the 1 year child. The so-called 'reflex' zone is equivalent to a PAZ were sheltering will automatically applied when specific EAL's or generic criteria (e.g.

				complete loss of the cooling, effective or supposed damage to an nuclear building, exceeding given radioactivity releases limits at the stack) are met. Due to the high population density in Belgium and around the Belgian NPP's, evacuation is not automatic.
80	Article 16.2	In III.F.3. Letter b (pag. 87)	According to the report, in the National Master Plan for Organisation in the Event of Emergencies, "the Information Cell is in charge of communications with the media and the population as well as with the neighbouring countries and specific target groups". Which institutions are part of the Information Cell? Who is in charge? Please provide additional information.	The organisation and working of the 'information cell' is under the responsibility of the Ministry of Home Affairs (General Direction Crisis centre - DG CC). This group is chaired by a communication expert of the DG CC and composed of communication experts from the organisation represented in the federal coordination committee (Decision making committee), i.e. representatives from concerned ministries (Public Health, Economy, Transport...), the regulatory body (FANC/Bel V), the Federal Agency for the Security of the Food Chain... The 'information cell' is permanently in contact with the communication experts of the local coordination committees and the licensee to coordinate the messages and ensure a coherent information of the population. The content of the information must be approved by the decision makers before being communicated to the population through the media by all communication actors at the national and local levels. Press conferences are organized at regular interval. A call centre is available within one hour from the time of notification. Published press communiqué will be copied to the IAEA, the EC and neighbouring countries in the framework of the ENAC (USIE), ECURIE and bilateral agreements. The coherence of the information for cross border events will be addressed through international or bilateral concertation.
81	Article 16.2	II.K.2., p84	Definition of the fourth level for the notification of emergencies,	Thank you for your comment

			which is dealing with events with fast kinetics, can be seen as area of good performance for Belgium.	
82	Article 17	p.95	"An action plan was launched as a result of the assessment, including:" What is the result of the action plan? What is realized from the plan?	All actions from the action plan concerning the protection of Belgian NPPs against external hazards have been completed by the licensee by the end of 2016. The last action completed was the improvements of the sewage systems for protecting the sites against internal flooding. The sites are now fully protected against all external hazards of a 10-000 year return period (flooding-earthquake-rains-...). The Belgian regulatory body is still reviewing the revaluation of the seismic hazard, ended by the licensee early 2016.
83	Article 17.1	Page 94	"The Tihange 2 and 3 and Doel 3 and 4 units were equipped with ultimate emergency systems" what about Doel 1&2 units? Is there a plan to provide them with this systems or different technical solutions were taken?	At page 94: "During the 1st periodic safety review of Doel 1 & 2, as external accidents had not been considered in the initial design, additional emergency systems were installed in a reinforced building (the Bunker)." These emergency systems are different from those of the other units (e.g., not the same redundancy, keeping the unit in hot shutdown for a longer time period, etc.), and protect the Doel 1 & 2 units against a range of internal and external hazards.
84	Article 17.1	Page 94	Did the airplane crash studies focus only on reactor buildings? Doel 1&2 units have one "GNH: the common nuclear auxiliary building" with most of safety systems and spent fuel pools for both units. Was this building's resistance to airplane crash and other external hazard evaluated?	For Doel 3 and 4 and Tihange 2 and 3, accidental aircaft crash, external fire and external explosion have been considered since the original licensing. For the three older units (Doel 1&2; Tihange 1), accidental aircraft crash and other external hazards (fire, explosion) have been considered since the first Periodic Safety Review (PSR). These analyses were not limited to the reactor building; the analyses are covering all SSCs that are necessary to bring the NPP to a safe shutdown. In this respect, also the GNH of Doel 1&2 has been evaluated against aircraft crash and external explosion. Later on (after 9/11/2001), intentional aircraft crash has also been

				considered. In these analyses, the focus was more oriented towards the resistance of the reactor buildings, but also considered the spent fuel pool in the GNH of the Doel 1&2 units. As indicated at pages 94-95, natural hazards (earthquake, flooding, extreme weather conditions) have been re-evaluated for all units on each site during PSRs and/or during the Stress Tests after March 2011.
85	Article 18	art.18	Strengthening of the application of Defense in Depth was an important lesson of Fukushima, also in the regulatory context of supervision. What, in the opinion of Belgium could or should be changed/added to the supervision programmes of regulatory authorities to increase the confidence in the application of DiD at the NPPs?	Belgium focused on the following aspects : - More importance of the compliance with the Technical Specifications (OLCs), namely related to the availability of safety systems - Better 4th level of DiD (mitigation) - National Emergency planning
86	Article 18.1	Section II.M.1 c), p99	The PGA level for Doel 1-2 has been determined in 1985 as 0.058 g. It is not clear whether in subsequent PSRs, including the post Fukushima Stress tests, the PGA value was brought to 0.1 g which is a minimum required by the IAEA. It is noted that Doel 1-2 containment and penetrations were assessed to be able to withstand the RLE of 0.17, but it is not clear whether other SSCs needed for a safe shutdown and	The SMR (seismic margin review) done during the stress addressed not only the containment but also the SSCs needed to shut down and to cool the units after an earthquake. The bunkered system were reviewed during this exercise. This exercise is of course not the same as a seismic design upgrade.

			cooling, and in particular the bunkered system, will be able to withstand such an earthquake. Please can you provide some information?	
87	Article 18.1	Section II.M. a), p98	The design basis for the bunker at Doel is the impact of an aircraft with the weight of 90 tons and 85 m/s. Does this apply for the bunker for units 3-4 or also for the units 1-2? Has the impact of an aircraft crash on the bunker been assessed during the Stress test, in the same way as the impact on the containment, and what are the results?	The aircraft loadings as indicated in the question were applied at the (original) licensing of Doel 3 and 4 and Tihange 2 and 3. Consequently, these loadings were not only applied to the reactor buildings, but indeed also to the bunkered buildings. The protection of Doel 1 & 2 against aircarft crash was dealt with after the original design, namely at the occasion of the first Periodic Safety Review (PSR). Consequently, because of limitations in the possibility for a posteriori backfitting, Doel 1 and 2 were evaluated and protected against less severe aircraft crash loadings. The impact of an intentional aircraft crash has been evaluated following the 2001 September 11 events (i.e. before the stress test of 2011). The results are summarised in section II.L.1.a (p. 94) of our National Report.
88	Article 18.1	p. 99	On page 99, Belgium explains that the additional systems to cope with external accidents will strengthen the third level of defence in depth. Could Belgium explain what the main design requirements for the safety systems on level 3 of defence in depth are and whether all design requirements for safety systems are met by the additional systems?	The additional systems to cope with external accidents are of course designed for the considered design loadings (external explosion, aircraft crash, etc.), but in addition they are also designed with principles that are considered for "normal" safety systems (in particular, the systems are redundant; supported by their own emergency support systems, etc.). These systems designed for external accidents, can also be used to cope with several internal accidents (e.g. transients) in case normal safety systems would fail. However, they cannot cope with LOCA or secondary line breaks. In this respect, the additional systems for external accidents provide to some extent a strengthening of the third level of defence-in-depth for internal events.

89	Article 18.1	p.99	… the safety rules were less numerous and less detailed than they were for the later Belgian units that were started between 1980 and 1985. For instance, physical separation was less strictly applied, seismic and post-accidental qualification were less developed,… Q.:Do you have requirements regarding post-accidental qualification of SSC in your legislation? Does the qualification of SSC in Belgian NPP include also qualification for design extension or severe conditions?	Yes. In the Royal Decree on "Safety Requirements for Nuclear Installations" of 30 November 2011 (MB-BS 2011 12 21), a.o. in section II article 20.7.3 (Residual heat removal function): "Means for removing residual heat from the shutdown core, during and after anticipated operational occurences or in accidental conditions must be foreseen, taking into account single failure and loss of off-site power " and article 21 (design extension conditions).
90	Article 19.2	p. 73	Can Belgium discuss in more detail the role of the Health Physics De-partment, Bel V and FANC in cases where the operational limits and conditions will be changed? According to IAEA Safety Standard SSG-12, OLCs need to be approved by the regulatory body. Changes to the OLCs require the approval of the regulatory body; see also SSG-12 para. 3.60 a) and d).	Changes to the Operational Limits and Conditions need to be justified by a safety assessment and have to be approved by the internal Health Physics Department and by the Regulatory Body, according to article 9.2 of SRNI-2011 (the Royal Decree of 30 November 2011). The detailled process is described page 72 of the Belgian report under article 14 "Assessment and Verification of Safety".
91	Article 19.3	II.N.1 c)	In article 19, II.N.1 c) it is stated that “for policy-related	Strict handling is applied to all quality documents of the following types: policy note, quality manual, operational procedure and

			procedures, operational procedures and instructions, more strict handling requirements have been established." Please, could you provide further detail on what those "more strict requirements" are, if are they related with documents updating procedures or record keeping procedures and what is the involvement of the regulatory body regarding the fulfilment of those requirements?	instruction. Quality documents with strict handling are inspected and approved/rejected by at least four roles: author, reviser, verifier and approver. Quality documents with strict handling are subject to systematic inspection. The strict handling guarantees that quality documents: • Are correct upon creation or modification; • Remain correct via systematic inspection. These requirements are independent from the inspection of the regulatory body.
92	Article 19.4	d) Certain studies relating ... pag 73	Please explain how is the severe accident program management of each NPP. Do those programs include Post Fukushima lessons learned? Please provide additional information.	For the Belgian NPPs, the Severe Accident Management Guidelines were developed and implemented between 1998 and 2002. The goal of the SAMGs is to stop core meltdown, preserve as much as possible the integrity of remaining barriers and limit and delay radioactive releases for as much and as long as possible and, if this becomes impossible, to mitigate the consequences of the accident. Depending on the plant site, SAMGs are either based on or inspired by procedures from Westinghouse, and are regularly updated to take into account international operating experience. SAMGs have been submitted to audit by the Belgian TSO. Custom tailoring the severe accident strategies benefits from the participation to international severe accident research programmes (like the MCCI tests, BIP-3,...) and from modelling efforts, using computer codes, severe accident scenarios and specific phenomena (by Tractebel Engineering). To improve NPP severe accident management capabilities, all plants have been equipped, long before Fukushima, with PARs in the containment and currently filtered containment venting systems are either being built or planned.

				The severe accident management programme is re-assessed through the PSR. The Stress Tests also led to a reassessment, and gave rise to the integration of the Post-Fukushima update of the WOG SAMG. Review is currently ongoing to ensure full compliance with the upcoming regulations based on WENRA RL 2014.
93	Article 19.5	II.N.1 e)	In article 19, II.N.1 e) it is stated that "The Engineering Department has the overall responsibility for the Technical Support Process." For Belgian multi-unit sites: Are these Engineering Departments shared across all units in each site, or is there one department per unit? Is there a regulatory requirement in that regard? Please provide additional information.	The engineering department is organised by site. It is then subdivided into subdivisions focussing on specific domains, like I&C, mechanics, projects…. On the regulatory side, the requirements for the organisational structure are set up in the Royal decree of 30 november 2011 that is mainly based on the WENRA RL. (art. 4.1: "The licensee documents and justifies his organisational structure by specifying the general policies, links of responsibility and authority, internal communication networks, tasks and number of staff required, which he implements in order to comply with the general requirements concerning the safe and reliable operation of his installation(s), in all operating conditions and in accident situations.") The organisational structure is described in the SAR. Any modification to the licensee organisational structure shoud follow the modification process (as described in the Belgian report pg 72-72)– requiring the approval of the regulatory body for important modification.
94	Article 19.6	p. 105	In the Belgian National Report, there are no incidents reported for the last three years, neither in the section on Article 6 nor in the section on Article 19. Could Belgium explain why no events have been reported? To our	The number of events with INES > 0, with a link to the FANC web site giving a description of the events is given page 11 in section I.C.3 f) of the Belgian report.

			knowledge, at least one event happened in 2015 (based on information from IAEA's incident reporting system and a FANC press release), leading to an inoperability of several safety trains. Can Belgium provide the required statistics of incidents in Belgian NPPs during the reporting period?	
95	Article 19.7	-	Has Belgium indicators of the reduction of human related events caused by the use of International / Internal Operating Experience Feedback? Please provide additional information.	The Continuous Improvement Management Department (CIM) of Electrabel coordinates the human performance program. Initially CIM did use the internal operating experience to identify the main human errors related to the root causes of the events in our nuclear fleet. Then, an international benchmarking was conducted to identify the best HU tools and program to fit our needs (addressing the most common HU errors). The HU program is reviewed every year in function of the results (statistics on use of HU tools, internal OE, …). Continuous improvement in this area is achieved by adapting the strategy to address the identified weaknesses. Each department makes a yearly self-assessment of their HU program and results (KPI, events, …) and develops the new action plan for the next year. HU tools have remained the same so far but focused actions for specific HU tools are defined (reinforce coaching, adapt training, communication with examples from OE, clarification on the use of HU tools : when, how…).