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☐ **Internal Note**
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Author(s) : Sylvain Nootens
Jurgen Claes

Classification:	None
Number:	2022-06-14-JC/SNOO-7-4-4-EN
Date:	2022-06-30
Title:	Practical guide for the reduction of frequency of radioactivity analysis in water

Summary:	This guide describes the approach to be followed by suppliers when drawing up and submitting a proposal to reduce the frequency of the control points (PDC-points) in their auto-control programme (application of Article 5, §4, RD 31/05/2016).

Effective date:	2022-01-01

Document approval

Review	Author	Verification	Approval
0	Sylvain Nootens	Jurgen Claes	Geert Biermans

Distribution

Intern : GLTOE, ICT
Path name : https://spsportal.fanc.be/sites/GLTOE/SRT_Env_FC/20220614-JC-SNOO-7-4-4-EN_Reduction_frequencies_EDWD.docx
Extern : Suppliers (food- and water production industry)

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Document History Log

Review	Review date	Modification description	By
0	2022-06-14	Initial version in EN	S. Nootens/J. Claes

1. Objective

Parameters to be analysed for the Euratom Drinking water Directive (2013/51/Euratom; H3, Rn222 and TID) can be exempted or reduced in frequency when certain conditions are met. Article 5 §4 of the Royal Decree 31/05/2016 states that the control of the parametric values – according the minimum frequency given in table 1 of Annex 1 – may not be longer required if, after a period of four consecutive years it can be established that the parametric value is unlikely to be exceeded.

In that case, the supplier may apply to the Agency for a reduction in the frequency of its self-monitoring programme.

This note provides insight into the conditions that have to be met and sets out the procedure to be followed by suppliers to request these possible reductions in frequencies.

2. Scope

Application of article 5 of the Royal Decree of 31 May 2016 (transposition of the 2013/51/Euratom) on protection from radioactive substances in water intended for human consumption.

3. Reduction of the monitoring frequency

The principles and conditions of FANC follow the principles as adopted in the general drinking water directive (EU) 2020/2184 of the European Parliament and of the Council of 16 December 2020 (Part C, Annex 2) setting out the requirements for the assessments of physico-chemical and microbiological parameters for water intended for human consumption which does not concern the radioactivity analyses.

More specific, the conditions are based upon the maximum and average value that is obtained for each control point or PDC (after at least 4 years of monitoring and minimum 2 analyses). The approach was confirmed to be in line with the possibility laid down in Annex II, point 1 of Council Directive 2013/51/Euratom and endorsed on 21/09/2021 by the European Commission (ENER.D.3).

The possible reduction of frequency is specific for each first level analyses type (H-3, Rn-222 and TID, the latter in Belgium assessed via the analysis of total α and residual β) – Table 1 – and is valid for contact and for incorporation or drinking water.

Table 1: Reduction proposal of the monitoring frequency for radioelements in water intended for human consumption after 4 years of monitoring and after approval of the request at FANC. These reduction frequencies are specific for each analysis type (H-3, Rn-222 and TID - i.e. α total and β residual) of each control point (PDC) of each supplier and are calculated on the basis of the respective average and maximum values of each control point after at least 4 years of monitoring and minimum 2 analyses.

H-3	Mean ≤ 30 Bq/L		Mean > 30 Bq/L and ≤ 60 Bq/L		Mean > 60 Bq/L	
	Max. value < 100 BQ/L	Max value ≥ 100 BQ/L	Max. value < 100 BQ/L	Max value ≥ 100 BQ/L	Max. value < 100 BQ/L	Max value ≥ 100 BQ/L
Frequency rate	1/5 of the initial frequency	No reduction	1/3 of the initial frequency	No reduction	1/2 of the initial frequency	No reduction
Minimum frequency rate that FANC accepts	0.1 (once every 10 years)	initial frequency	0.2 (once every 5 years)	initial frequency	0.2 (once every 5 years)	initial frequency
Rn-222	Mean ≤ 30 Bq/L		Mean > 30 Bq/L and ≤ 60 Bq/L		Mean > 60 Bq/L	
	Max. value < 100 BQ/L	Max value ≥ 100 BQ/L	Max. value < 100 BQ/L	Max value ≥ 100 BQ/L	Max. value < 100 BQ/L	Max value ≥ 100 BQ/L
Frequency rate	0	1/3 of the initial frequency	1/3 of the initial frequency	1/2 of the initial frequency	1/2 of the initial frequency	No reduction
Minimum frequency rate	0	0.2 (once every 5 years)	0.2 (once every 5 years)	0.2 (once every 5 years)	0.2 (once every 5 years)	initial frequency
TID	Mean ≤ 0,03 mSv/y		Mean > 0,03 mSv/y and ≤ 0,06 mSv/y		Mean > 0,06 mSv/y	
	Max. value < 0.1 mSv/y	Max value ≥ 0.1 mSv/y	Max. value < 0.1 mSv/y	Max value ≥ 0.1 mSv/y	Max. value < 0.1 mSv/y	Max value ≥ 0.1 mSv/y
Frequency rate	1/5 of the initial frequency	1/3 of the initial frequency	1/3 of the initial frequency	1/2 of the initial frequency	1/2 of the initial frequency	No reduction
Minimum frequency rate that FANC accepts	0.1 (once every 10 years)	0.2 (once every 5 years)	0.2 (once every 5 years)	0.2 (once every 5 years)	0.2 (once every 5 years)	initial frequency

Note 1: A minimum of two analysis are required to qualify for a reduction demand. If the frequency is 0.25 (1 sample/analysis every 4 years), a second analysis is required in the 5th year before claiming for a reduction.

Note 2: Dividing the initial sampling frequency by a factor of 2, 3 or 5 may lead to impractical non-rounded values. If this is the case, frequency value is round up to 0.1, 0.2, 0.25, 0.5, (0.75) or 1 if the reduction frequency is less than or equal to 1 and to round up to the nearest unit (2, 3, 4, ...) when the latter is greater than 1 (example: a frequency of 2.3/year becomes 2 whereas 2.7 becomes 3).

Note 3: If the total α analyses are always less than 0.1 Bq/L and the residual β analyses are always less than 0.2 Bq/L, the TID is never calculated because it is always considered to be less than 0.1 mSv/year. In this case, the supplier may assume that the average TID is less than 0.03 mSv/year and follow the corresponding frequency reduction and minimum frequency parameters.

4. Procedure to be followed by the supplier

The procedure to be followed by the supplier to request a reduction in the frequency of its own monitoring programme from FANC can be described as follows:

1. **Log on** to the DXP platform: https://dxp.fanc.be/.
2. **Download the latest versions of the guides and templates** in the "Help" section (https://dxp.fanc.be/EDWD/Help). The Excel Template for the Frequency Reduction Proposal or Request will be available in the downloaded ZIP file.
3. **Export the Excel PDC-list file** of your auto-control programme.
4. **Copy** the data from the PDC-List export into the frequency reduction proposal file (please use the "Copy" and "Paste as values" function !).
5. **Export the values of all the analyses that are present in the DXP database.**
6. **Calculate per active PDC point the mean and max value** for H-3, Rn-222 and TID (also for α total and β residual; b total is optional).

NB : If there was no α total or β residual violation you have no TID values; according to note 3 in the frequency reduction table you may then fill in 0 or < 0.03 mSv/year.

7. Fill in the average and maximum value per PDC point in the frequency reduction proposal file.
8. **Determine the new frequencies** via the frequency table (Table 1); e.g. 1/5th of the initial frequency 1 is 0.2 = 1 sample per 5 years; the absolute minimum is 0.1 with the exception of Rn-222 which can become 0.
9. **Enter the structural message** in the "change request comment" for each PDC point.

Example : In our TEMPLATE example, for supplier Y, this gives for the first 2 lines:

a. *4year (f1); H3 (mean=7, max=8, f0.2); Rn (mean=71, max=85, f0.5); TID (mean=0.039, max=0.046; f0.5)) - alpha total and beta residual should not be mentioned in the structural message but should be present in the reduction proposal file.*
   - 4year (f1) during the first 4-year period, the frequency for this item was 1;
   - H3 (mean=7, max=8, f0.2) the max and mean value for H3 for this point, according to the table this is 1/5th of the original frequency so f0.2 or 1 per 5 years;
   - Rn: with the values for Rn this means 1/2 of the original frequency so f0.5 or 1 per 2 years;
   - TID: this means 1/3 of the original frequency is 0.33 or rounded up to f0.5.

b. *4year (f5); H3 (mean=5; max=12; f1); Rn222 (mean=15; max=26: f0); TID (mean=0; max=0; f1)*
   - the initial frequency of this point was 5 times per year;
   - according to the max and mean values this leads to the frequency for H3 = f1, Rn = 0, aT/bR (or TID) = f1. This means that radon does not need to be measured anymore, the others for this point are reduced to 1x/year.

10. **Give the date** when you want the new regime to come into force; this can be retroactive (e.g. 1/01/2022 as long as the date is > the last measurement in the database and > 4 years measurement period).
11. **Upload the frequency reduction proposal table to "Attachments".**
12. **Update the data for the PDC points** (fill in the new proposed frequencies as present and determined in the excel file).
13. If necessary, update other data, such as administrative data, new volumes at the PDC points, new lab...).
14. **Submit the proposal** to be approved by the FANC.