



Document title	Threshold and target values for radioactivity core indicator
Code	3-2 Rev1
Category	CMNT
Agenda Item	3 – Development of dose-based indicator threshold values and approach for the next indicator evaluation
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Submitted by	Poland
Reference	

Background

This document contains draft part on “Good Environmental Status” of the radioactivity core indicator report and describes the new proposed threshold values and target values.

Action requested

The Meeting is invited to

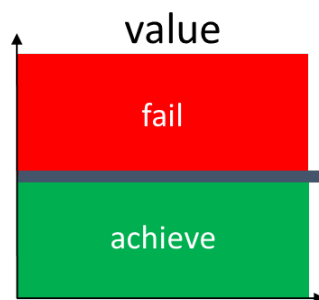
- discuss on the proposal for methodology for deriving threshold values.
- agree on threshold values for core indicator on radioactive substances

Good Environmental Status

According to the new BSAP ecological objective “**Minimal risk to humans and the environment from radioactivity**”, new threshold values have been proposed which are based on radiological reference criteria for protection of the public and the environment and thus are to guarantee the safety of biota and meet the criterion for the safety of fish consumption.

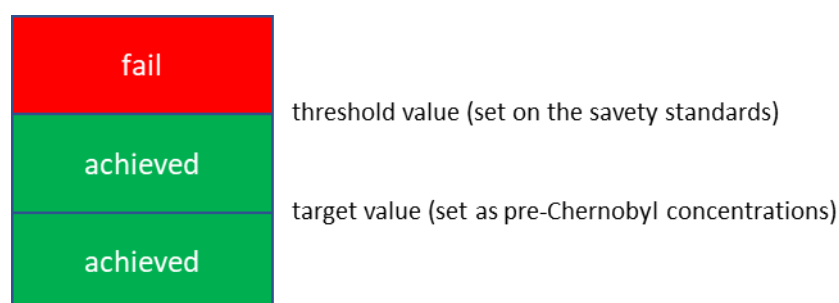
For setting the threshold value, the annual threshold dose of 10 μSv from artificial radionuclides, which is the effective dose to members of the public for calculations (EC Basic Safety Standards, 2013) was used. Based on this value, the threshold value for fish was evaluated assuming an average annual fish consumption of 25 kg. The threshold value for fish determined in this way was 31 Bq kg^{-1} and on its basis, the threshold value for seawater was determined using concentration ratio (calculated on the basis of many years of monitoring data series). The recommended threshold value for seawater is 180 Bq m^{-3} . Using the determined threshold values for fish and seawater, the total dose rate from both sources was calculated. The total dose to fish derived from the threshold values ($53 \cdot 10^{-4} \mu\text{Gy h}^{-1}$) meets the criteria for the protection of fauna and flora which according to ICRP (2008) is equal to the lower value of the 'derived consideration reference levels' (DCRL), which is equal to 40 $\mu\text{Gy h}^{-1}$.

The good status is achieved when the activity concentration of radionuclide caesium-137 (^{137}Cs) is below 31 Bq kg^{-1} for fish and 180 Bq m^{-3} for seawater.



Good environmental status figure 1. Good status is achieved when the activity concentration levels of the radionuclide caesium-137 (^{137}Cs) are below the threshold value. The threshold values are 31 Bq kg^{-1} for fish and 180 Bq m^{-3} for seawater.

Considering the significant contamination with radioactive isotopes, including ^{137}Cs , which occurred as a result of the Chernobyl accident, the most desirable situation from the point of view of environmental status of the Baltic Sea would be to achieve pre-Chernobyl concentrations. Therefore, target values have also been set. The activity concentration of the radionuclide caesium-137 (^{137}Cs) set as target values for fish are 2.5 Bq kg^{-1} for herring, 2.9 Bq kg^{-1} for flounder and plaice, and 15 Bq m^{-3} for seawater. The quantitative boundaries used for defining the target values corresponds to pre-Chernobyl activity concentration levels, in other words the levels before 1986.



Threshold values are uniform across all assessment units due to uniform distribution of pre-Chernobyl radioactivity levels caused by atmospheric fallout from nuclear weapons testing.

The confidence of the threshold values is considered high, being based on the recommended safety standards (stringent safety criteria were used for the calculations) and on long-term monitoring data used for the calculation of the concentration ratio values.

Assessment Protocol

The evaluation of whether the threshold is achieved or not is carried out by calculating the mean value of all samples during the assessment period for each assessment unit and comparing these values against the threshold values.