



Recommendation ITU-R F.1565-1
(11/2019)

Performance degradation due to interference from other services sharing the same frequency bands on a co-primary basis, or from other sources of interference, with real digital fixed wireless systems used in the international and national portions of a 27 500 km hypothetical reference path at or above the primary rate

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Note: This ITU-R Recommendation was approved in English under the procedure detailed in Resolution ITU-R 1.

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RECOMMENDATION ITU-R F.1565-1

Performance degradation due to interference from other services sharing the same frequency bands on a co-primary basis, or from other sources of interference, with real digital fixed wireless systems used in the international and national portions of a 27 500 km hypothetical reference path at or above the primary rate

(2002-2019)

Scope

This Recommendation* specifies performance degradation due to interference from other services sharing the same frequency bands on a co-primary basis, or from all other sources of interference, with real digital fixed wireless systems used in the international and national portions of a 27 500 km hypothetical reference path at or above the primary rate. These performance degradations are defined, for each direction of real fixed wireless links, for synchronous digital hierarchy (SDH) systems designed according to Recommendation ITU-T G.828, or for other systems designed according to Recommendation ITU-T G.826.

Keywords

Fixed wireless system, hypothetical reference path, interference, performance degradation, real fixed wireless systems link.

Abbreviations

BBER	Background bloc error ration
EPO	Error performance objective
ESR	Errored second ration
FWS	Fixed wireless systems
HRC	Hypothetical reference connection
HRP	Hypothetical reference path
SESR	Severely errored second ration
SDH	Synchronous digital hierarchy

Related ITU Recommendations and Reports

Recommendation ITU-R F.1094 – Maximum allowable error performance and availability degradations to digital fixed wireless systems arising from radio interference from emissions and radiations from other sources

Recommendation ITU-R F.1668 – Error performance objectives for real digital fixed wireless links used in 27 500 km hypothetical reference paths and connections

Recommendation ITU-T G.826 – End-to-end error performance parameters and objectives for international, constant bit-rate digital paths and connections

Recommendation ITU-T G.828 – Error performance parameters and objectives for international, constant bit-rate synchronous digital paths

* The structure and format of this Recommendation may need to be revised in the future to include the detailed technical information from the *recommends* part to a separate Annex.

The ITU-R Radiocommunication Assembly,

considering

- a) that there is a need to establish the allowable aggregate performance degradation due to interference from other co-primary services sharing the same bands with real fixed wireless systems (FWS) links in the international and national portions of a hypothetical reference path (HRP) defined in Recommendations ITU-T G.826 and ITU-T G.828;
- b) that there is a need to establish the allowable aggregate performance degradation due to interference from any source and applications other than co-primary in the considered frequency band of real FWS links in the international and national portions of a HRP;
- c) that Recommendation ITU-R F.1668, based on Recommendations ITU-T G.826 and G.828, specifies error performance objectives for real digital fixed wireless links which may form part of the international and national portion of a 27 500 km HRP and hypothetical reference connections (HRC);
- d) that Recommendation ITU-R F.1094 provides the maximum allowable error performance and availability degradations to digital fixed wireless systems arising from radio interference from co-primary services and emissions from other sources,

recommends

1 that, in each direction of any real digital FWS link of length L_{link} , in the international portion of an HRP at or above the primary rate, the allowable degradation in performance resulting from the aggregate of the emissions from systems of other co-primary services should not exceed the limits given by means of equation (1) in any month, using the values in Tables 1 and 2 for synchronous digital hierarchy (SDH) systems designed according to Recommendation ITU-T G.828 and values in Tables 3 and 4 for other systems designed according to Recommendation ITU-T G.826 (see Notes 1, 2, 3, 4, 10 and 11); the Tables are derived from the overall EPO presented in Recommendation ITU-R F.1668 and considering the appropriate maximum allowable value of degradation for frequency sharing on a primary basis (interservice sharing) $Y\% = 10\%$ established by Recommendation ITU-R F.1094.

$$\text{Degradation in EPO due to interference} = B_j \times (L_{link}/L_R) + C_j \quad (1)$$

where:

$j = 1$	for $L_{min} \leq L_{link} \leq 1\,000$ km	(intermediate country)
$j = 2$	for $1\,000$ km $< L_{link}$	(intermediate country)
$j = 3$	for $L_{min} \leq L_{link} \leq 500$ km	(terminating country)
$j = 4$	for 500 km $< L_{link}$	(terminating country)

Error performance objective (EPO) is substituted by the parameters errored second ration (ESR), severely errored second ratio (SESR) and background block error ratio (BBER) as appropriate.

L_{min} : lower limit of L_{link} , used to scale the objectives to the real case, provisionally equal to 50 km

L_R : reference length, $L_R = 2\,500$ km

B_R : block allowance ratio, $B_R = (0 < B_R \leq 1)$;

TABLE 1

Parameters for the objectives for degradation of performance due to interference for intermediate countries according to Recommendation ITU-T G.828

Parameter	Bit rate (kbit/s)	$L_{min} \leq L_{link} \leq 1\ 000\ km$		$1\ 000\ km < L_{link}$	
		B_1	C_1	B_2	C_2
ESR	1 664	$5 \times 10^{-5} (1 + B_R)$	0	5×10^{-5}	$2 \times 10^{-5} \times B_R$
ESR	2 240	$5 \times 10^{-5} (1 + B_R)$	0	5×10^{-5}	$2 \times 10^{-5} \times B_R$
ESR	6 848	$5 \times 10^{-5} (1 + B_R)$	0	5×10^{-5}	$2 \times 10^{-5} \times B_R$
ESR	48 960	$1 \times 10^{-4} (1 + B_R)$	0	1×10^{-4}	$4 \times 10^{-5} \times B_R$
ESR	150 336	$2 \times 10^{-4} (1 + B_R)$	0	2×10^{-4}	$8 \times 10^{-5} \times B_R$
SESR	1 664-150 336	$1 \times 10^{-5} (1 + B_R)$	0	1×10^{-5}	$4 \times 10^{-6} \times B_R$
BBER	1 664-48 960	$2.5 \times 10^{-7} (1 + B_R)$	0	2.5×10^{-7}	$1 \times 10^{-7} \times B_R$
BBER	150 336	$5 \times 10^{-7} (1 + B_R)$	0	5×10^{-7}	$2 \times 10^{-7} \times B_R$

TABLE 2

Parameters for the objectives for degradation of performance due to interference for terminating countries according to Recommendation ITU-T G.828

Parameter	Bit rate (kbit/s)	$L_{min} \leq L_{link} \leq 500\ km$		$500\ km < L_{link}$	
		B_3	C_3	B_4	C_4
ESR	1 664	$5 \times 10^{-5} (1 + B_R)$	0	5×10^{-5}	$1 \times 10^{-5} \times B_R$
ESR	2 240	$5 \times 10^{-5} (1 + B_R)$	0	5×10^{-5}	$1 \times 10^{-5} \times B_R$
ESR	6 848	$5 \times 10^{-5} (1 + B_R)$	0	5×10^{-5}	$1 \times 10^{-5} \times B_R$
ESR	48 960	$1 \times 10^{-4} (1 + B_R)$	0	1×10^{-4}	$2 \times 10^{-5} \times B_R$
ESR	150 336	$2 \times 10^{-4} (1 + B_R)$	0	2×10^{-4}	$4 \times 10^{-5} \times B_R$
SESR	1 664-150 336	$1 \times 10^{-5} (1 + B_R)$	0	1×10^{-5}	$2 \times 10^{-6} \times B_R$
BBER	1 664-48 960	$2.5 \times 10^{-7} (1 + B_R)$	0	2.5×10^{-7}	$5 \times 10^{-8} \times B_R$
BBER	150 336	$5 \times 10^{-7} (1 + B_R)$	0	5×10^{-7}	$1 \times 10^{-7} \times B_R$

TABLE 3

Parameters for the objectives for degradation of performance due to interference for intermediate countries according to Recommendation ITU-T G.826

Parameter	Bit rate (Mbit/s)	$L_{min} \leq L_{link} \leq 1\ 000\ km$		$1\ 000\ km < L_{link}$	
		B_1	C_1	B_2	C_2
ESR	1.5-5	$2 \times 10^{-4} (1 + B_R)$	0	2×10^{-4}	$8 \times 10^{-5} \times B_R$
ESR	> 5-15	$2.5 \times 10^{-4} (1 + B_R)$	0	2.5×10^{-4}	$1 \times 10^{-4} \times B_R$
ESR	> 15-55	$3.75 \times 10^{-4} (1 + B_R)$	0	3.75×10^{-4}	$1.5 \times 10^{-4} \times B_R$
ESR	> 55-160	$8 \times 10^{-4} (1 + B_R)$	0	8×10^{-4}	$3.2 \times 10^{-4} \times B_R$
ESR	> 160-3 500	Under study	Under study	Under study	Under study
SESR	1.5-3 500	$1 \times 10^{-5} (1 + B_R)$	0	1×10^{-5}	$4 \times 10^{-6} \times B_R$
BBER (see Note 6)	1.5-3 500	$1 \times 10^{-6} (1 + B_R)$	0	1×10^{-6}	$4 \times 10^{-7} \times B_R$

TABLE 4

Parameters for the objectives for degradation of performance due to interference for terminating countries according to Recommendation ITU-T G.826

Parameter	Bit rate (Mbit/s)	$L_{min} \leq L_{link} \leq 500$ km		500 km $< L_{link}$	
		B_3	C_3	B_4	C_4
ESR	1.5-5	$2 \times 10^{-4} (1 + B_R)$	0	2×10^{-4}	$4 \times 10^{-5} \times B_R$
ESR	> 5-15	$2.5 \times 10^{-4} (1 + B_R)$	0	2.5×10^{-4}	$5 \times 10^{-5} \times B_R$
ESR	> 15-55	$3.75 \times 10^{-4} (1 + B_R)$	0	3.75×10^{-4}	$7.5 \times 10^{-5} \times B_R$
ESR	> 55-160	$8 \times 10^{-4} (1 + B_R)$	0	8×10^{-4}	$1.6 \times 10^{-4} \times B_R$
ESR	> 160-3 500	Under study	Under study	Under study	Under study
SESR	1.5-3 500	$1 \times 10^{-5} (1 + B_R)$	0	1×10^{-5}	$2 \times 10^{-6} \times B_R$
BBER (see Note 6)	1.5-3 500	$1 \times 10^{-6} (1 + B_R)$	0	1×10^{-6}	$2 \times 10^{-7} \times B_R$

2 that, in each direction of any real digital FWS link of length L_{link} belonging to the long-haul inter-exchange network section of the national portion of an HRP at or above the primary rate, the allowable degradation in performance resulting from the aggregate of the emissions from systems of other co-primary services should not exceed in any month, the provisional limits given in Table 5 for SDH systems designed according to Recommendation ITU-T G.828 and in Table 6 for other systems designed according to Recommendation ITU-T G.826 (see Notes 1, 2, 3, 4, 10 and 11); the Tables are derived from the overall EPO presented in Recommendation ITU-R F.1668 and considering the appropriate maximum allowable value of degradation for frequency sharing on a primary basis (interservice sharing) $Y\% = 10\%$ established by Recommendation ITU-R F.1094.

TABLE 5

Objectives for degradation of performance due to interference for real SDH FWS links belonging to the long-haul inter-exchange network section of the national portion of the HRP according to Recommendation ITU-T G.828

Rate (Mbit/s) \ Parameter	1.664 (VC-11, TC-11)	2.240 (VC-12, TC-12)	6.848 (VC-2, TC-2)	48.960 (VC-3, TC-3)	150.336 (VC-4, TC-4)
ESR	$0.001 \times A$	$0.001 \times A$	$0.001 \times A$	$0.002 \times A$	$0.004 \times A$
SESR	$0.0002 \times A$				
BBER	$5 \times 10^{-6} \times A$				$1 \times 10^{-5} \times A$

TABLE 6

Objectives for degradation of performance due to interference for real FWS links belonging to the long-haul inter-exchange network section of the national portion of the HRP at or above the primary rate according to Recommendation ITU-T G.826

Parameter \ Rate (Mbit/s)	1.5 to 5	> 5 to 15	> 15 to 55	> 55 to 160	> 160 to 3 500
ESR	0.004 A	0.005 A	0.0075 A	0.016 A	For further study
SESR	0.0002 A	0.0002 A	0.0002 A	0.0002 A	0.0002 A
BBER	$2 A \times 10^{-5}$ (see Note 5)	$2 A \times 10^{-5}$	$2 A \times 10^{-5}$	$2 A \times 10^{-5}$	$1 A \times 10^{-5}$

where:

$$A = (A_1 + 0.002) L_{link}/100 \quad \text{for } 50 \text{ km} \leq L_{link} \leq 100 \text{ km}$$

$$A = A_1 + 2 \times 10^{-5} L_{link} \quad \text{for } 100 \text{ km} < L_{link}$$

A_1 has provisionally been agreed to be in the range of 0.01 to 0.02 (1% to 2%) (see Notes 7 and 9);

3 that, in each direction of any real digital FWS link of length L_{link} forming all of the short-haul inter-exchange network section of the national portion of HRP, the allowable degradation in performance resulting from the aggregate of the emissions from systems of other co-primary services should not exceed in any month, the provisional limits given in Table 7 for SDH systems designed according to Recommendation ITU-T G.828 and in Table 8 for other systems designed according to Recommendation ITU-T G.826 (see Notes 1, 2, 3, 4, 10 and 11). The tables are derived from the overall EPO presented in Recommendation ITU-R F.1668 and considering the appropriate maximum allowable value of degradation for frequency sharing on a primary basis (interservice sharing) $Y\% = 10\%$ established by Recommendation ITU-R F.1094.

TABLE 7

Objectives for degradation of performance due to interference for real SDH FWS links forming all of the short-haul inter-exchange network section of the national portion of the HRP according to Recommendation ITU-T G.828

Parameter \ Rate (Mbit/s)	1.664 (VC-11, TC-11)	2.240 (VC-12, TC-12)	6.848 (VC-2, TC-2)	48.960 (VC-3, TC-3)	150.336 (VC-4, TC-4)
ESR	$0.001 \times B$	$0.001 \times B$	$0.001 \times B$	$0.002 \times B$	$0.004 \times B$
SESR	$0.0002 \times B$				
BBER	$5 \times 10^{-6} \times B$				$1 \times 10^{-5} \times B$

TABLE 8

Objectives for degradation of performance due to interference for real FWS links forming all of the short-haul inter-exchange network section of the national portion of the HRP at or above the primary rate according to Recommendation ITU-T G.826

Rate (Mbit/s) Parameter	1.5 to 5	> 5 to 15	> 15 to 55	> 55 to 160	> 160 to 3500
ESR	$0.004 B$	$0.005 B$	$0.0075 B$	$0.016 B$	For further study
SESR	$0.0002 B$	$0.0002 B$	$0.0002 B$	$0.0002 B$	$0.0002 B$
BBER	$2 B \times 10^{-5}$ (see Note 5)	$2 B \times 10^{-5}$	$2 B \times 10^{-5}$	$2 B \times 10^{-5}$	$1 B \times 10^{-5}$

The value of B has provisionally been agreed to be in the range of 0.075 to 0.085 (7.5% to 8.5%) (see Notes 7, 8 and 9);

4 that, in each direction of any real digital FWS link of length L link forming all of the access network section of the national portion of HRP, the allowable degradation in performance resulting from the aggregate of the emissions from systems of other co-primary services should not exceed in any month, the provisional limits given in Table 9 for SDH systems designed according to Recommendation ITU-T G.828 and in Table 10 for other systems designed according to Recommendation ITU-T G.826 (see Notes 1, 2, 3, 4, 10 and 11). The tables are derived from the overall EPO presented in Recommendation ITU-R F.1668 and considering the appropriate maximum allowable value of degradation for frequency sharing on a primary basis (interservice sharing) $Y\% = 10\%$ established by Recommendation ITU-R F.1094.

TABLE 9

Objectives for degradation of performance due to interference for real SDH FWS links forming all of the access network section of the national portion of the HRP according to Recommendation ITU-T G.828

Rate (Mbit/s) Parameter	1.664 (VC-11, TC-11)	2.240 (VC-12, TC-12)	6.848 (VC-2, TC-2)	48.960 (VC-3, TC-3)	150.336 (VC-4, TC-4)
ESR	$0.001 \times C$	$0.001 \times C$	$0.001 \times C$	$0.002 \times C$	$0.004 \times C$
SESR	$0.0002 \times C$				
BBER	$5 \times 10^{-6} \times C$				$1 \times 10^{-5} \times C$

TABLE 10

Objectives for degradation of performance due to interference for real FWS links forming all of the access network section of the national portion of the HRP at or above the primary rate according to Recommendation ITU-T G.826

Rate (Mbit/s)	1.5 to 5	> 5 to 15	> 15 to 55	> 55 to 160	> 160 to 3500
Parameter					
ESR	0.004 <i>C</i>	0.005 <i>C</i>	0.0075 <i>C</i>	0.016 <i>C</i>	For further study
SESR	0.0002 <i>C</i>	0.0002 <i>C</i>	0.0002 <i>C</i>	0.0002 <i>C</i>	0.0002 <i>C</i>
BBER	$2 C \times 10^{-5}$ (see Note 5)	$2 C \times 10^{-5}$	$2 C \times 10^{-5}$	$2 C \times 10^{-5}$	$1 C \times 10^{-5}$

The value of *C* has provisionally been agreed to be in the range of 0.075 to 0.085 (7.5% to 8.5%) (see Notes 7, 8 and 9);

5 that for the error performance objectives evaluation in *recommends* 1 to 4, the error performance parameters for any real link are defined as follows:

- ESR is the ratio of errored second (ES) events to total seconds in the available time during a fixed measurement interval;
- SESR is the ratio of severely errored second (SES) events to total seconds in the available time during a fixed measurement interval;
- BBER is the ratio of background block error (BBE) events to total blocks in the available time during a fixed measurement interval. The count of total blocks excludes all blocks during SESs;

6 that, in case of EPO degradation due to interference from any source other than co-primary services sharing the same bands with real fixed wireless systems (FWS) links, Recommendation ITU-R F.1094 establishes the appropriate maximum allowable value of degradation for all other sources of interference $Z\% = 1\%$; therefore, the EPO degradation calculated according *recommends* 2, 3, 4 and 5 should be divided by a factor of 10;

7 that Annex 1 should be used as guidance in the application of this Recommendation.

NOTE 1 – The SES, BBE and ES events and the block structure for SDH multiplex and regenerator sections are defined in Recommendation ITU-T G.829; the SES, BBE and ES events and the block structure for paths are defined in Recommendations ITU-T G.826 and ITU-T G.828.

NOTE 2 – A real link is defined as a portion of a path coming from partitioning and it is characterized by its real length, L_{link} .

NOTE 3 – The error performance objectives apply only when the link is considered to be available. The entry and exit criteria into and from the unavailable state are defined in Recommendations ITU-T G.826 and ITU-T G.828.

NOTE 4 – According to Recommendations ITU-T G.826 and ITU-T G.828 the suggested evaluation period is one month for any parameter. In FWS links these objectives should be respected for any month (see Recommendation ITU-R P.581).

NOTE 5 – For systems installed based on designs prior to 1996, the BBER interference objective is $3 \times 10^{-5} \times A$ (or *B* or *C* accordingly).

NOTE 6 – For systems with bit rates of 1.5 to 5 Mbit/s designed prior to 1996, the BBER values in Tables 3 and 4 should be multiplied by a factor of 1.5.

NOTE 7 – The sum of the percentages $A_1\% + B\% + C\%$ shall not exceed 17.5%, in accordance with the allocations to the national portion of an international constant bit rate path given in Recommendations ITU-T G.826 and ITU-T G.828.

NOTE 8 – The provisional values agreed for $B\% + C\%$ are in the range 15.5% to 16.5%.

NOTE 9 – Depending on national network configurations administrations may reallocate the $A\%$, $B\%$ and $C\%$ block allowances among the sections of the national portion of a radio path.

NOTE 10 – In the case of multihop links the objectives derived according to this Recommendation apply to the overall links (irrespective of the date when each hop was brought into service and of the number of independent operators involved); the allocation of the objectives to each hop is under the responsibility of the network operators.

NOTE 11 – The limits on allowable interference from space services apply to the aggregate effect of emissions from space stations, direct long-term emissions from earth stations and interference due to the anomalous propagation of emissions from earth stations.

Annex 1

Application examples

This Annex shows some examples of the application of this Recommendation to real links, in order to derive the objectives when interference from co-primary services is concerned.

The calculations in the first two examples are made for ESR, SESR and BBER for a link in the international portion of a HRP with length, L_{link} , of 105 km.

Furthermore:

- An intermediate country is assumed.
- B_R is assumed to be equal to 1.
- The evaluation time is one month (30 days).

Example 1:

Bit rate: 150 336 kbit/s (VC-4, TC-4), i.e. objectives according to Recommendation ITU-T G.828.

Number of blocks/s: 8 000

The objectives are calculated from equation (1) and with B_1 and C_1 from Table 1.

$ESR = 2 \times 10^{-4} (1 + 1) \times 105/2\,500 + 0 = 168 \times 10^{-7}$	Number of ES/month = 44
$SESR = 1 \times 10^{-5} (1 + 1) \times 105/2\,500 + 0 = 84 \times 10^{-8}$	Number of SES/month = 3
$BBER = 5 \times 10^{-7} (1 + 1) \times 105/2\,500 + 0 = 4.2 \times 10^{-8}$	Number of BBE/month = 871

Example 2:

Bit rate: 140 Mbit/s, i.e. objectives according to Recommendation ITU-T G.826.

Number of blocks/s: 8 000

The objectives are calculated from equation (1) and with B_1 and C_1 from Table 3.

$$\text{ESR} = 8 \times 10^{-4} (1 + 1) \times 105/2\,500 + 0 = 672 \times 10^{-7}$$

$$\text{Number of ES/month} = 175$$

$$\text{SESR} = 1 \times 10^{-5} (1 + 1) \times 105/2\,500 + 0 = 84 \times 10^{-8}$$

$$\text{Number of SES/month} = 3$$

$$\text{BBER} = 1 \times 10^{-6} (1 + 1) \times 105/2\,500 + 0 = 8.4 \times 10^{-8}$$

$$\text{Number of BBE/month} = 1\,742$$

The calculations in the next two examples are made for ESR, SESR and BBER for links in the national portion of an HRP (objectives according to Recommendation ITU-T G.826).

Example 3:

The access portion of the network is 20 km long and it is formed by a single link:

Link $L_3 = 20$ km

Capacity: 2 Mbit/s

Number of blocks/s: 2 000

In this case the objectives are length independent; if $C = 0.075$ is assumed (see *recommends 4*) it gives:

$$\text{ESR} = 0.004 C = 3 \times 10^{-4} \text{ (equivalent to 778 ES/month)}$$

$$\text{SESR} = 0.0002 C = 1.5 \times 10^{-5} \text{ (equivalent to 39 SES/month)}$$

$$\text{BBER} = 2 \times 10^{-5} \times C = 1.5 \times 10^{-6} \text{ (equivalent to 7776 EB/month)}$$

EB: errored block.

Example 4:

The short haul portion of the network is 80 km long and it is formed by a single link:

Link $L_4 = 80$ km

Capacity: 34 Mbit/s

Number of blocks/s: 8 000

In this case the objectives are length independent; if $B = 0.075$ is assumed (see *recommends 3*) it gives:

$$\text{ESR} = 0.0075 B = 5.625 \times 10^{-4} \text{ (equivalent to 1 458 ES/month)}$$

$$\text{SESR} = 0.0002 B = 1.5 \times 10^{-5} \text{ (equivalent to 39 SES/month)}$$

$$\text{BBER} = 2 \times 10^{-5} \times B = 1.5 \times 10^{-6} \text{ (equivalent to 31 104 EB/month)}$$

Example 5:

Real link in long-haul portion of the network, designed according to Recommendation ITU-T G.828:

Link $L_5 = 75$ km

SDH transmission rate: VC-4 (150.336 Mbit/s)

Number of blocks/s: 8 000

$$\text{ESR} = 0.004 A = 0.004 (A_1 + 0.002) \times 75/100$$

$$\text{SESR} = 2 \times 10^{-4} \times A = 2 \times 10^{-4} \times (A_1 + 0.002) \times 75/100$$

$$\text{BBER} = 1 \times 10^{-5} \times A = 1 \times 10^{-5} \times (A_1 + 0.002) \times 75/100$$

In this case the objectives are length dependent; in Table 11 the minimum and the maximum limits ($A_1 = 0.01$ and $A_1 = 0.02$) are shown:

TABLE 11
Values for the objectives

A_1 value	ESR	SESR	BBER
0.01	36×10^{-6} (= 94 ES/month)	18×10^{-7} (= 5 SES/month)	9×10^{-8} (= 1 867 EB/month)
0.02	66×10^{-6} (= 171 ES/month)	33×10^{-7} (= 9 SES/month)	165×10^{-8} (= 3 422 EB/month)

NOTE – Rounding to immediately superior integer has been used for fractional results.