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**ФЕДЕРАЛЬНОЕ АГЕНТСТВО  
ПО ТЕХНИЧЕСКОМУ РЕГУЛИРОВАНИЮ И МЕТРОЛОГИИ**

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**НАЦИОНАЛЬНЫЙ  
СТАНДАРТ  
РОССИЙСКОЙ  
ФЕДЕРАЦИИ**

**ГОСТ Р  
54505 –  
2011**

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**Безопасность функциональная**

**УПРАВЛЕНИЕ РИСКАМИ  
НА ЖЕЛЕЗНОДОРОЖНОМ ТРАНСПОРТЕ**

Москва  
2011



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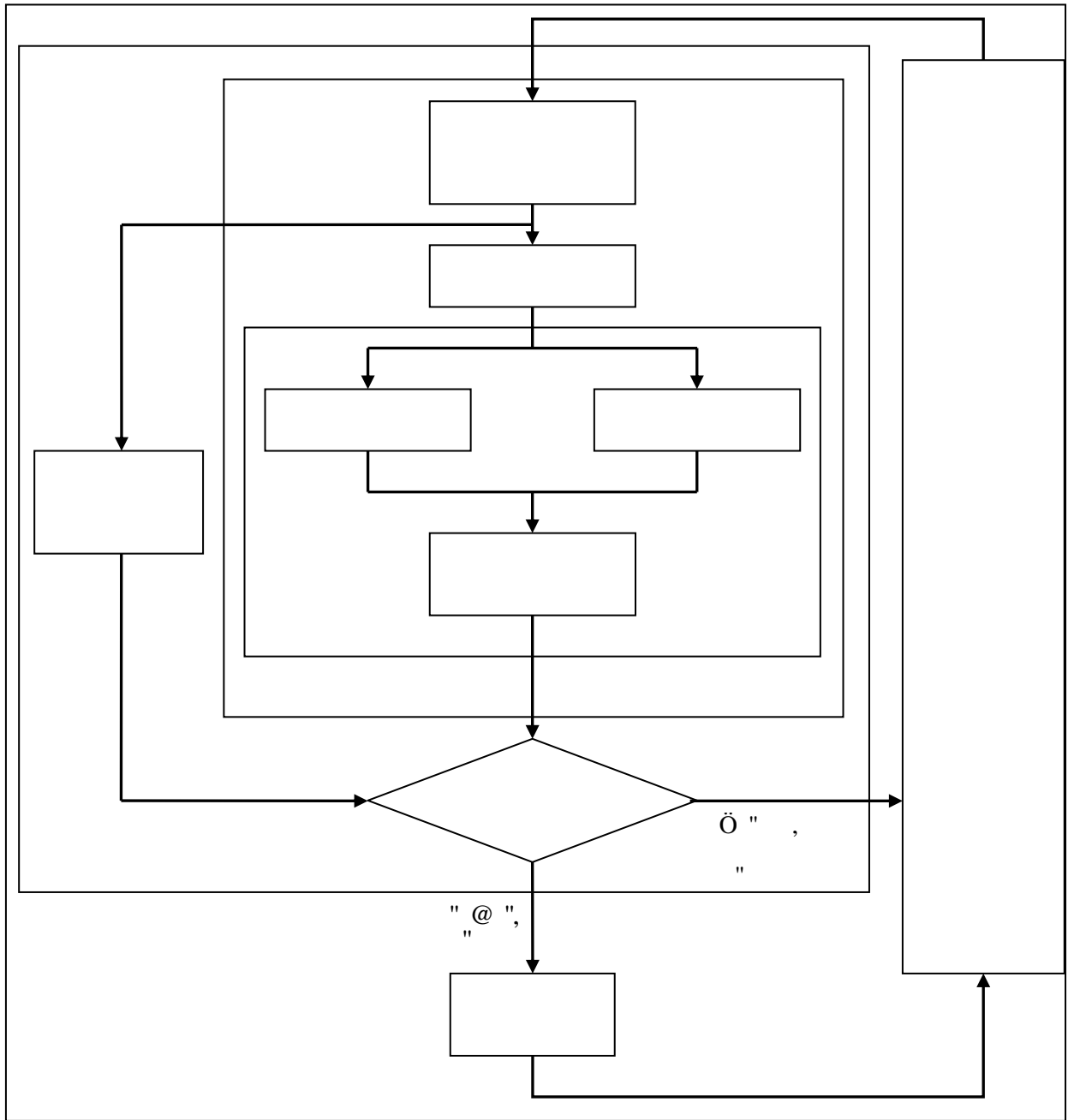






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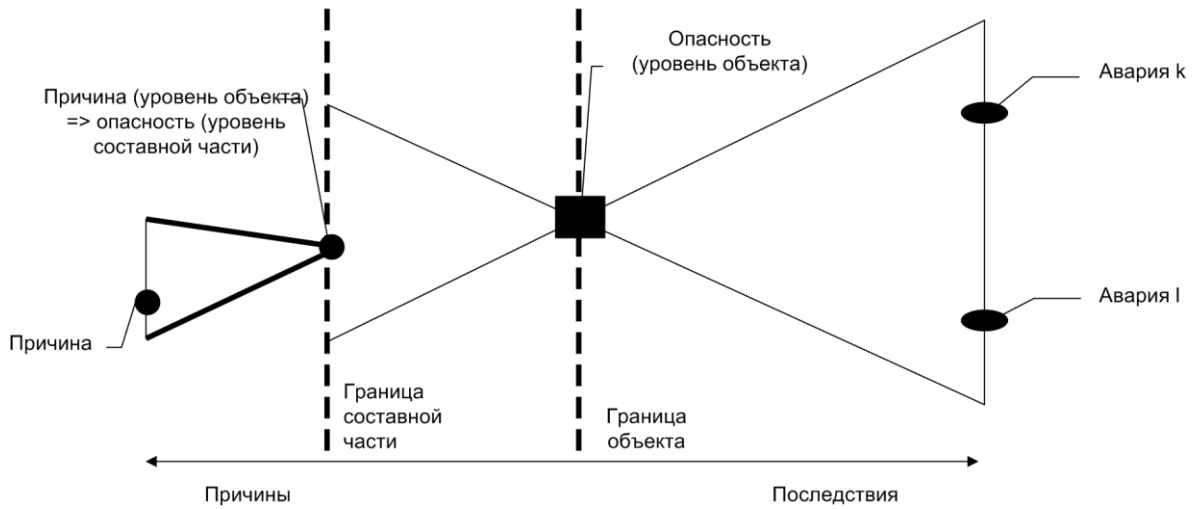
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$$\bar{C} = \frac{\sum_{i=1}^N C_i}{N}, \quad * 6)0$$

C<sub>i</sub> "ó " " i (i=" 3 ÌN),

$$R = F_R\{C, P\} = f \cdot \bar{C} \quad * 0$$

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$$f = \frac{20}{1} = 20 \text{ 1/}$$

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	40 ≤ f < 100
	15 ≤ f < 40
	6 ≤ f < 15
	2 ≤ f < 6
	f < 2

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$$\bar{C} = (58,56 + 1623,12 + 209,28 + 869,15 + 628,75 + 4459,78 + 1063,38 + 104,48 + 2680,11 + 314,63 + 975,70 + 135,39 + 80,00 + 1800,00 + 5573,62 + 1596,35 + 810,00 + 6238,05 + 356,00 + 2134,07) / 20 = 1585,50$$

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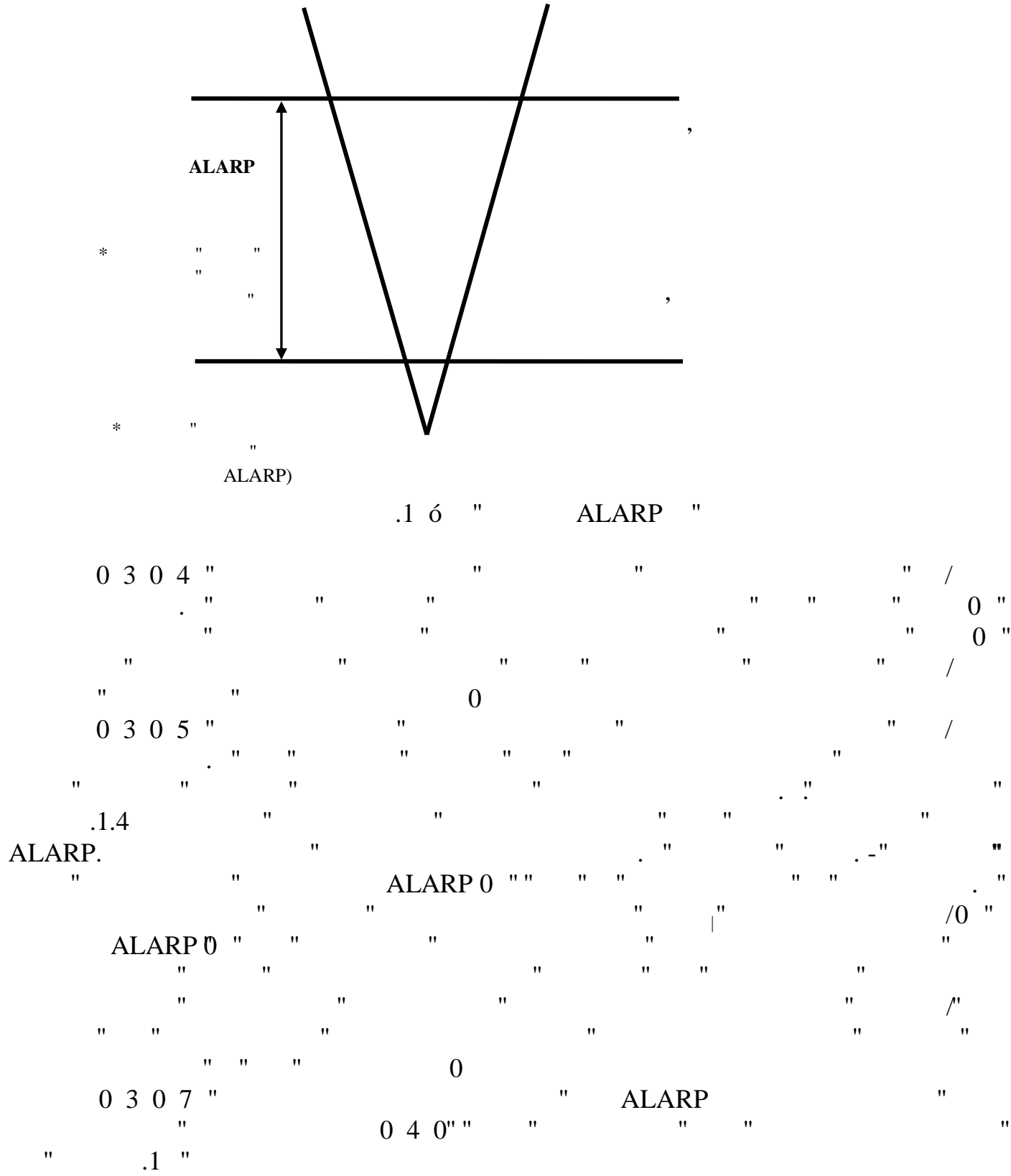
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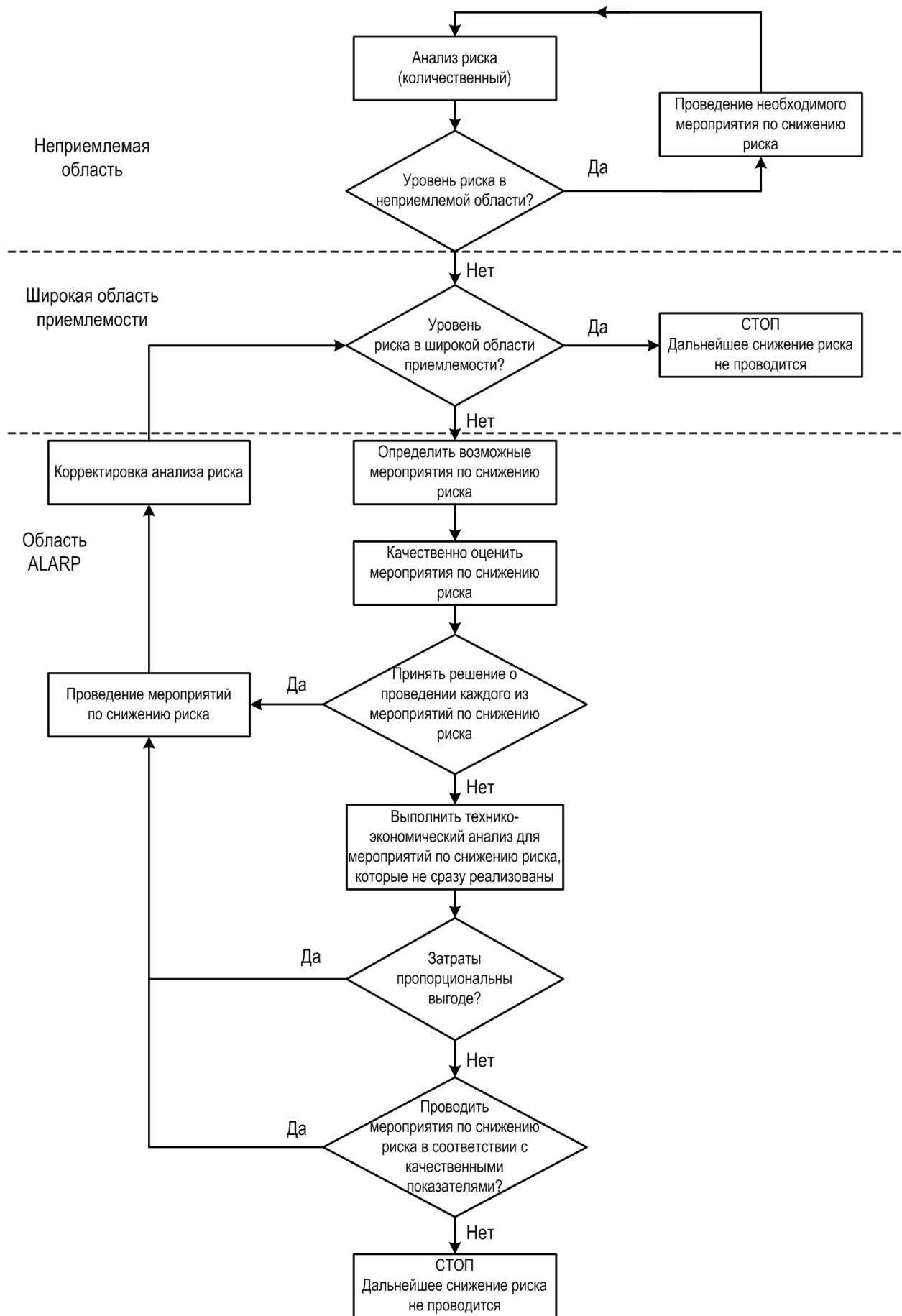
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.1.6

$$\begin{aligned}
 & \frac{1}{1+r} \left[ \sum_{j=0}^{n-1} \frac{1}{(1+r)^j} \left( \sum_{i=0}^{j-1} \frac{1}{(1+r)^i} \right) \right] \\
 & = \frac{1}{1+r} \left[ \sum_{j=0}^{n-1} \frac{1}{(1+r)^j} \left( \frac{1 - (1+r)^{-j}}{1 - (1+r)^{-1}} \right) \right] \\
 & = \frac{1}{1+r} \left[ \sum_{j=0}^{n-1} \frac{1}{(1+r)^j} \left( \frac{1 - (1+r)^{-j}}{r} \right) \right] \\
 & = \frac{1}{r} \left[ \sum_{j=0}^{n-1} \frac{1 - (1+r)^{-j}}{(1+r)^{j+1}} \right] \\
 & = \frac{1}{r} \left[ \sum_{j=0}^{n-1} \frac{1}{(1+r)^{j+1}} - \sum_{j=0}^{n-1} \frac{(1+r)^{-j}}{(1+r)^{j+1}} \right] \\
 & = \frac{1}{r} \left[ \frac{1 - (1+r)^{-n}}{1+r} - \sum_{j=0}^{n-1} \frac{1}{(1+r)^{j+1}} \right] \\
 & = \frac{1}{r} \left[ \frac{1 - (1+r)^{-n}}{1+r} - \frac{1 - (1+r)^{-n}}{1+r} \right] \\
 & = 0
 \end{aligned}$$

.1.7

$$\begin{aligned}
 & \frac{1}{1+r} \left[ \sum_{j=0}^{n-1} \frac{1}{(1+r)^j} \left( \sum_{i=0}^{j-1} \frac{1}{(1+r)^i} \right) \right] \\
 & = \frac{1}{1+r} \left[ \sum_{j=0}^{n-1} \frac{1}{(1+r)^j} \left( \frac{1 - (1+r)^{-j}}{1 - (1+r)^{-1}} \right) \right] \\
 & = \frac{1}{1+r} \left[ \sum_{j=0}^{n-1} \frac{1}{(1+r)^j} \left( \frac{1 - (1+r)^{-j}}{r} \right) \right] \\
 & = \frac{1}{r} \left[ \sum_{j=0}^{n-1} \frac{1 - (1+r)^{-j}}{(1+r)^{j+1}} \right] \\
 & = \frac{1}{r} \left[ \sum_{j=0}^{n-1} \frac{1}{(1+r)^{j+1}} - \sum_{j=0}^{n-1} \frac{(1+r)^{-j}}{(1+r)^{j+1}} \right] \\
 & = \frac{1}{r} \left[ \frac{1 - (1+r)^{-n}}{1+r} - \sum_{j=0}^{n-1} \frac{1}{(1+r)^{j+1}} \right] \\
 & = \frac{1}{r} \left[ \frac{1 - (1+r)^{-n}}{1+r} - \frac{1 - (1+r)^{-n}}{1+r} \right] \\
 & = 0
 \end{aligned}$$

.1.9

$$\begin{aligned}
 & \sum_{k=1}^K f_{ik} \times i_k - f_{ik} \times i_k \\
 & = \sum_{k=1}^K f_{ik} \times i_k - f_{ik} \times i_k \\
 & = 0
 \end{aligned}$$

$$C_{ik} = \frac{1}{\sum_{i=1}^I \sum_{k=1}^K c_{ik}} \left[ \sum_{i=1}^I \sum_{k=1}^K c_{ik} \cdot \frac{1}{c_{ik}} \right]$$

$$K = \left\{ \begin{matrix} 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50 \end{matrix} \right\}$$

$$i = \left\{ \begin{matrix} 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50 \end{matrix} \right\}$$

ALARP

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**.2 MEM**

Minimum Endogenous Mortality =  $\frac{1}{R_m}$

$$R_m = \frac{1}{\sum_{i=1}^I \sum_{k=1}^K c_{ik} \cdot \frac{1}{c_{ik}}}$$

$R_1 \approx 10^{-5}$

$R_2 \approx 10^{-4}$

$R_3 \approx 10^{-3}$

DRA +





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(ISO Guide 73:2009) (Risk management óVocabulary)

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