Part II: Application of concepts

Question 3 (8 Points): Risk Acceptance Criteria

(8 Points) Consider a person using a technical system 10 times a year. In average the person uses the system for 2 min each time. The technical system is in a hazardous condition due to hazard 1 twice a year and it takes about 24 hours to restore the system to safe operation. The probability that hazard 1 leads to an accident is 1%, but if an accident happens, the person is killed inevitably. There is also a second hazard which leads to an accident in 100% of all case: Here it takes only 1h to restore the system. The probability that this hazard kills the person is very low with 10^{-5}. This hazard occurs in average every second year.
Calculate the individual risk of fatality and decide whether the MEM criterion is fulfilled or not. You can simplify your calculation by assuming that a year has 10000h.

$$RF_{total} = \sum_{All\ hazards\,i} A_i \cdot F_i \cdot \frac{N_{endangered,i}}{N_{all}} \cdot HR_i$$

$$IRF_i = \sum_{hazard_j} NP_i \cdot \left[HR_j \cdot (D_j + E_{i\,j}) \cdot \sum_{accidents_k} A_{jk} \cdot F_{jk} \right]$$