

### Chapter 13. Energy Accidents

**Homework 13.1.** (Contributed by Toru Muta) Suppose that an oil refinery is considering whether they install additional fire protection equipment or not. This equipment can protect some facilities from severe fire disasters, and reduce the loss from 100 million US\$ to 10 million US\$, following  $L(x) = 100 \cdot e^{-9.16x} + 10$ , where  $L$  is the loss in million US\$, and  $x$  is the spending on this equipment per year. The probability of severe fire disasters is supposed to be once per 50 years. Solve the optimal spending. What is the loss in the severe fire disaster at the optimal spending?

**Homework 13.2.** (Contributed by Derek Klingeman) How do renewable energy technologies impact energy safety and energy security? How does the US government promote increased renewable energy supplies and how does this differ from its promotion of nuclear power several decades earlier?

**Homework 13.3.** (Contributed by Rachel Wimbish) How do simple failures of equipment or procedures escalate unpredictable events into energy disasters?

**Homework 13.4.** (Contributed by Anant Garg) What information does a manager of an energy company need to know in order to make a risk assessment in regards to energy accidents?