



Exercise I

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Workshop Example - Brewery in the US



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An American brewery south of Columbia, South Carolina, wants besides fire insurance cover against earthquake, storm and flooding. The brewery exists for 50 years and brews beer according to traditional methods.

The factory lies particularly favourable at the crossing of two highways and a railway track as well as close to a river, the Bull Swamp Creek. The owner considers insurance a routine issue. On demand a detailed plan of the factory could be supplied.

Address:

Fresh Foam Brewery
Savannah Highway 132 (crossing Whetstone Road)
29112 Swansea
South Carolina - US

Total sum insured: 50 Mio. US\$

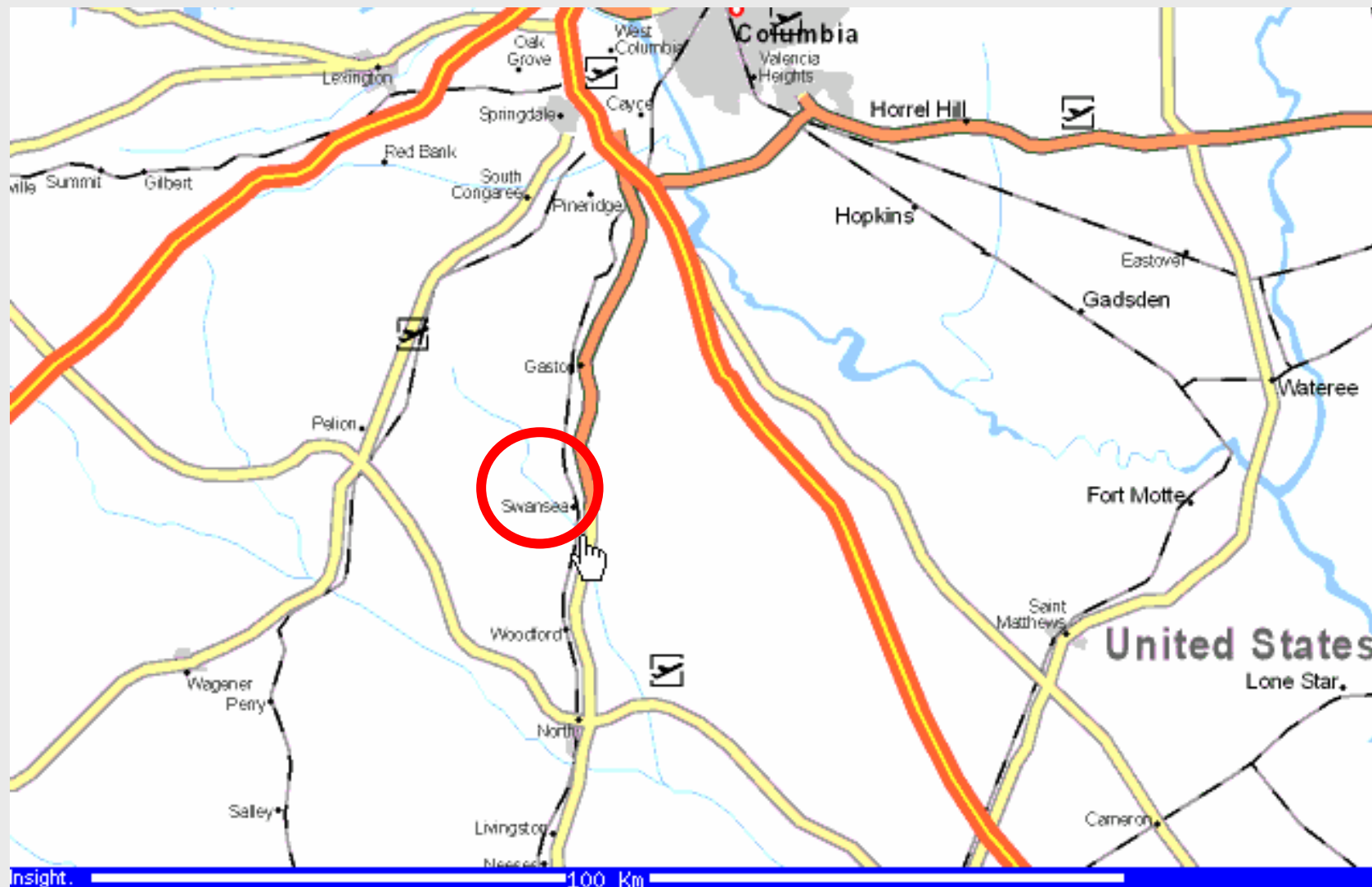
No deductibles, no limits

Workshop Example - Brewery in the US

Geographic location according to the internet (www.multimap.com)



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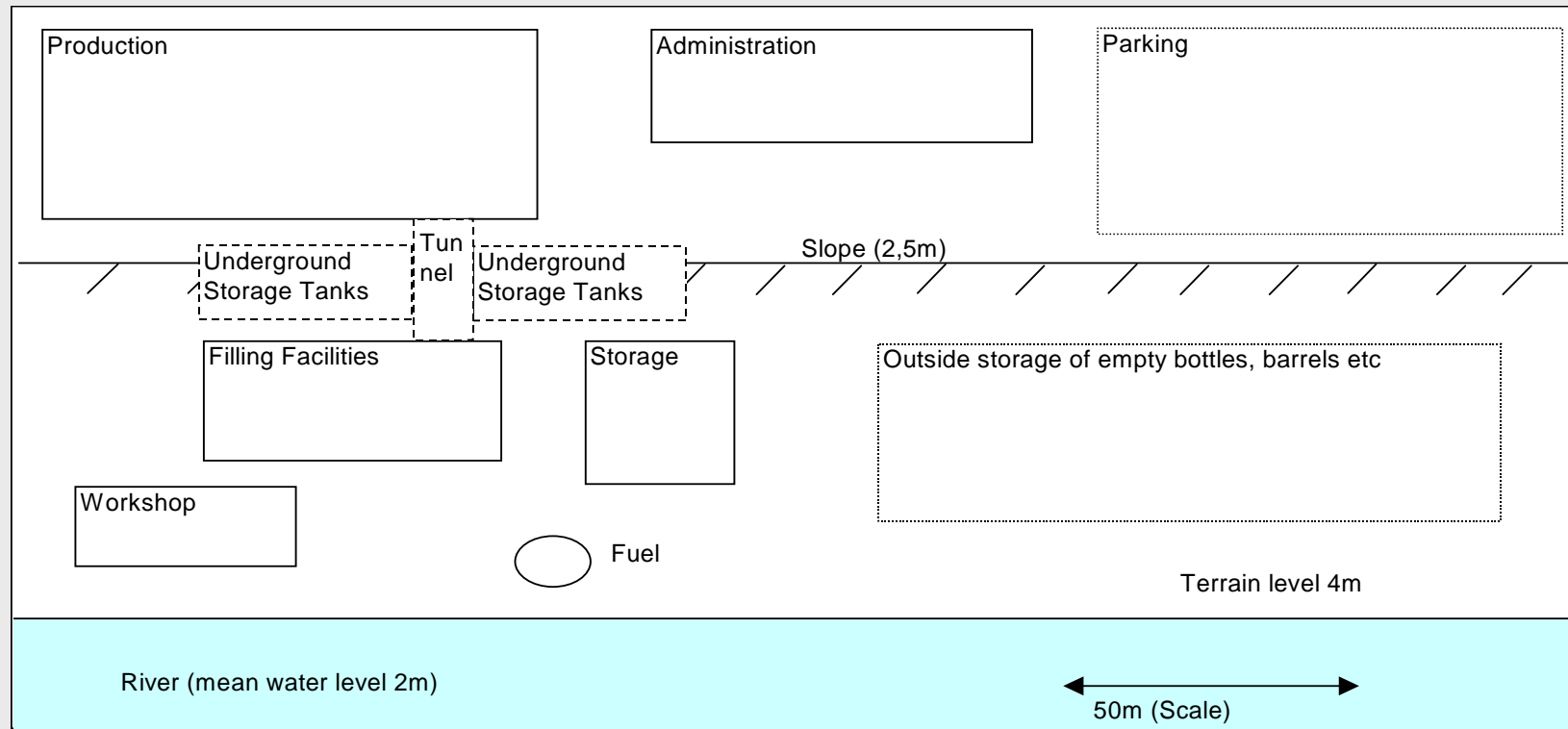


Workshop Example - Brewery in the US

Site plan with insurance relevant information



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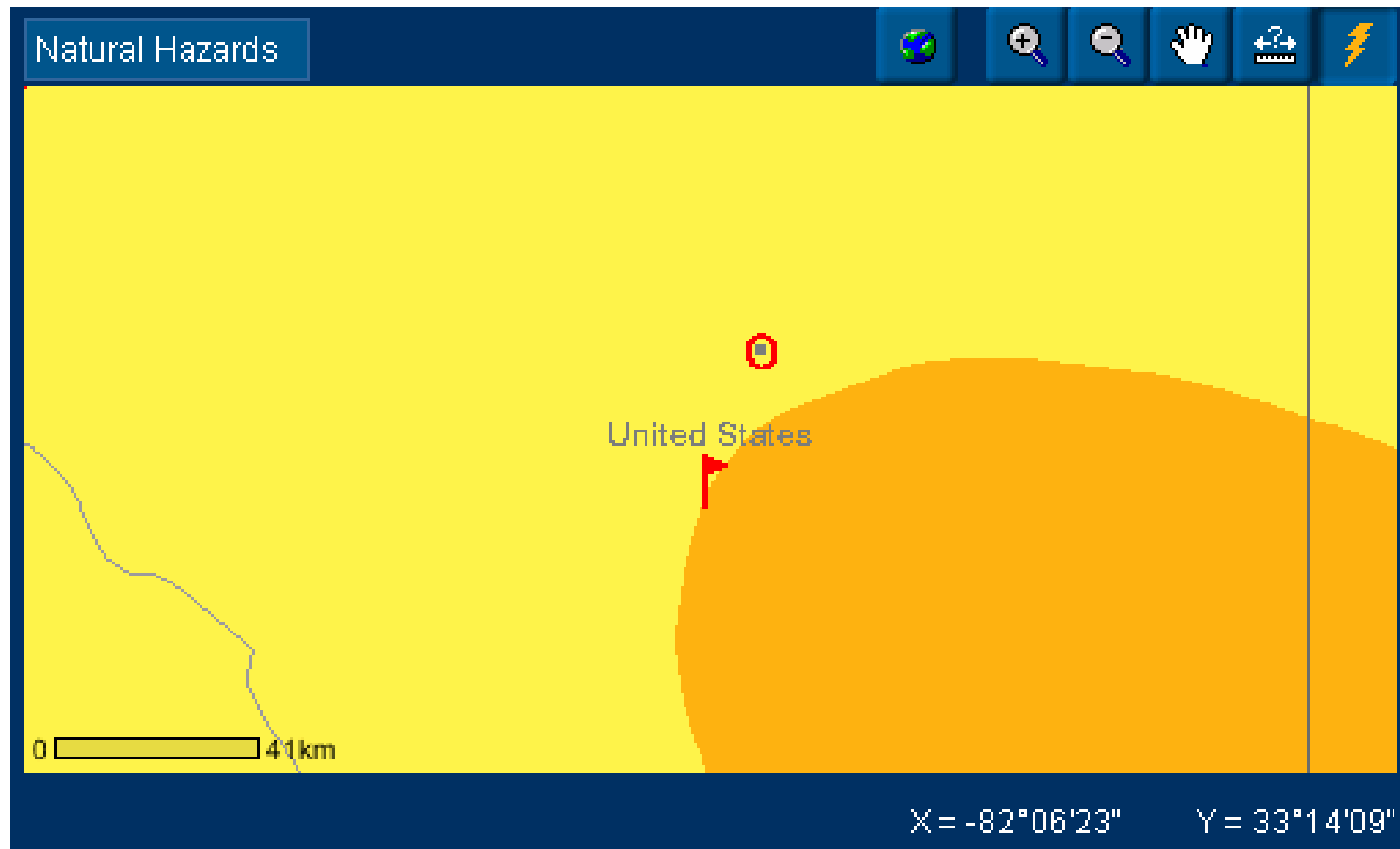
Building	Structure/Material	Contents	Process	SI (Mio. US\$)
Administration	Brick	Office Materials, Files, Data, Comp.		8
Parking	Tarmack	app. 40 Cars		
Production	Brick	Water Tubes, Brewery Vat	Brew. process, Fermentation	17
Undergr. Storage	Brick	Beertanks, Electr. Switchboards	Cooling, Storage	9
Filling Facilities	Concrete	Electr. Switchboards, Fill. Machines	Filling, Pasteurization	9
		Pasteurization Tanks		
Storage	Wood	Full Bottles, Barrels etc.	Storage	4
Outside Storage		Empty Bottles, Barrels etc.	Storage	1
Workshop	Concrete	Tools, Machines	Repair	1
Fuel	Aluminium	Petrol		1

Example Earthquake

Earthquake hazard according to CD-Rom „World of natural hazards“



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Earthquake

-  Zone 0: MM V and below
-  Zone 1: MM VI
-  Zone 2: MM VII
-  Zone 3: MM VIII
-  Zone 4: MM IX and above

Example Earthquake

Vulnerability

Vulnerability:

Intensity	VI	VII	VIII	IX
Loss [% of TSI]	0.4	2	7	15



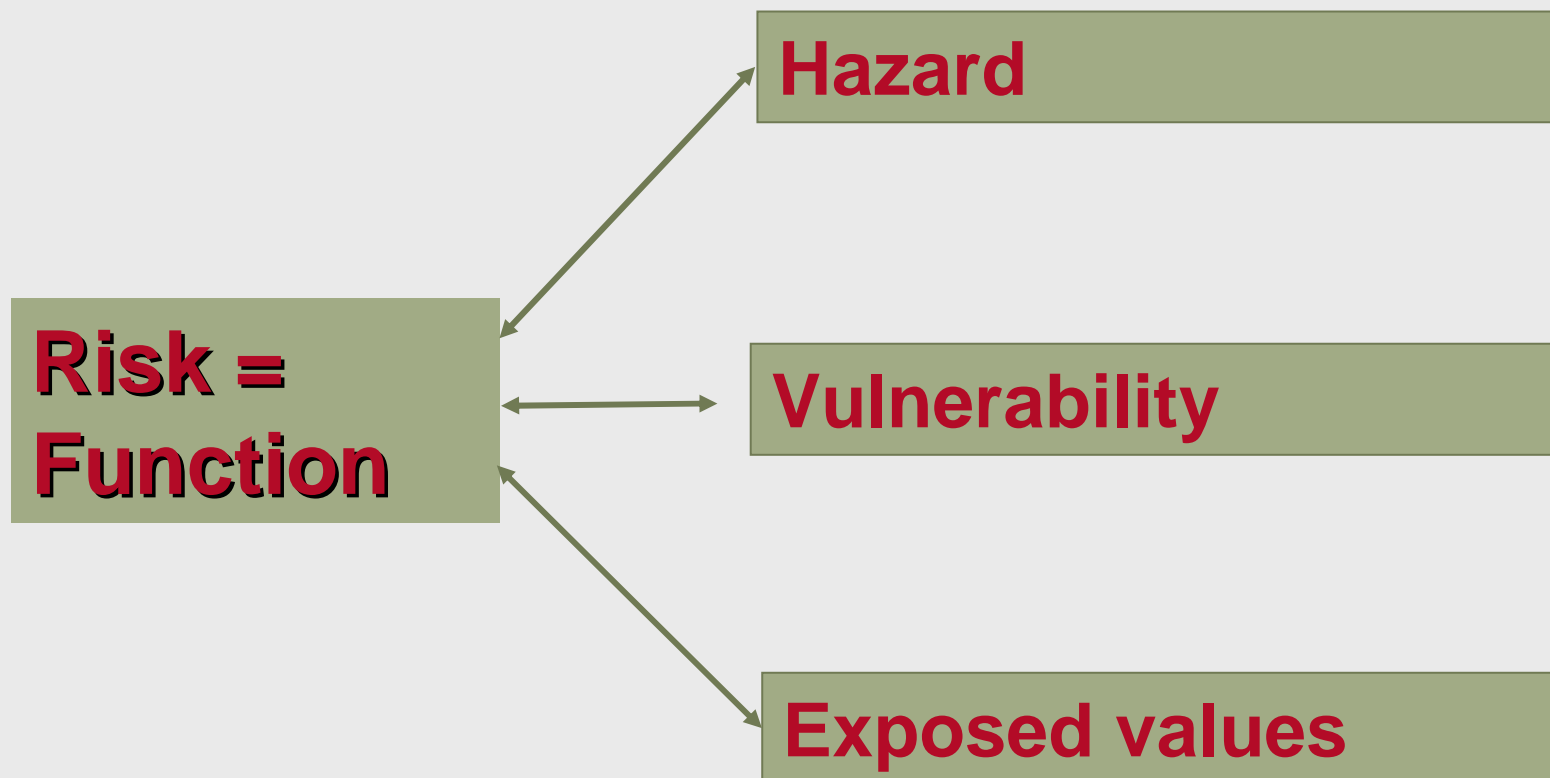
Exercise I (Results)

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How can we assess the expected loss?



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Hazard

1. Evaluation of the hazard level for a specific return period
2. Modification of the hazard level due to local effects
3. Assessment of the return period of other hazard levels



Vulnerability

4. Evaluation of loss ratios for all hazard levels
5. Adjustment of loss ratios due to risk specific factors



Calculation

6. Loss calculation for each hazard level
7. Summation of losses weighted by return period

Example Earthquake



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Example Earthquake

Hazard



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1. Basic hazard level:

Intensity VI – VII

2. Local factors:

Amplification, Liquefaction - potential due to location next to a river

Modified Intensity: VII +

3. Assessment of the return period of other hazard levels :

Factor 3 - 4

Intensity	VI	VII	VIII	IX
Return period	125	500	1500	4500

Example Earthquake

Vulnerability



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4. Vulnerability:

Intensity	VI	VII	VIII	IX
Loss [% of TSI]	0.4	2	7	15

5. Vulnerability is increased due to the age of the factory. (Faktor 1.3)

Intensity	VI	VII	VIII	IX
Loss [% of TSI]	0.5	2.6	9.1	19.5

Example Earthquake

Calculation



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6. Calculation

Intensity (MMI)	VI	VII	VIII	IX
Return Period (Years)	125	500	1500	4500
Loss (% of TSI)	0.5	2.6	9.1	19.5

$$\begin{aligned} 7. \text{ Rate} &= 0.5\% \cdot 1/125 + 2.6\% \cdot 1/500 + 9.1\% \cdot 1/1500 + 19.5\% \cdot 1/4500 \\ &= 0.0196\% = 0.196\text{‰} \end{aligned}$$