Identifying Hazards

Definition

Hazards are system conditions that, in combination with environmental conditions outside our control, can result in a loss.

Our task is to **write a list** of hazards, staying broadly general and covering all the losses.

For each of the **losses** defined earlier, we'll identify one or more **hazards**.

Thermostat Example

	Losses
L1	Room gets too cold (2 or more degrees below target)
L2	Room gets too hot (2 or more degrees above target)
L3	Damage to facilities, property, or the heating equipment itself
L4	Waste of fuel
L5	Physical harm to humans or pets

	Hazards	Losses
H1	HEAT ON when room is already warm (2 or more degrees above target)	L2, L4, L3
H1.1	Heater can't turn off	L2, L4
H2	HEAT OFF when room is already cold (2 or more degrees below target)	L1, L3, L4
H2.1	Heater can't turn on	L1
H3	Short cycles of HEAT ON and HEAT OFF	L4, L3?

This list of hazards is not yet complete; we have not identified hazards for *L5: Physical harm to humans or pets*, and we haven't expressed much about *L3: Damage to facilities, property, or the heating equipment itself*.

Desired Qualities

- Concise — We want a relatively short list
- General — We don't want to prematurely narrow our focus.
- Good coverage — For any accident we can think up, we want it to be described by at least one of the hazards on this list.
- Non-redundant — Overlap between hazards is ok, but if one loss is entirely a subset of another, perhaps consider consolidating them.
- Under our control — For them to be useful in guiding our actions, hazards should identify conditions we can actually do something about. Things outside our control (like weather, meteors, or the popularity of particular websites) are environmental conditions.
- Relevant — They should be associated with the losses in a meaningful way.

  Perhaps list what environmental condition would result in the loss.

Strategic Approaches

Ask "what is *risky but tolerable*?" vs. "what is *unacceptable*?" to distinguish from losses— What is a priority?

Relationship to other concepts

The relationship between **losses** and **hazards** lets us *prioritize* our safety efforts, focusing on preventing the system states that are relevant to producing these accidents— we don't need to examine every combination of system states.