we have sensors recording problems ...

... and wish to add remote sensors

There seems to be a relationship...
A RemoteSensor is a Sensor. But it doesn’t have ranges or states that the system can control.

Does a RemoteSensor have ProblemIntervals? In this design it does!
RemoteSensor has an inherited relationship with ProblemInterval that it ignores as well.

1. The subclass extends its superclass with new behaviors.
2. The subclass is not merely a utility or helper class.
3. The subclass is a special kind of an object.
4. An object never needs to transmute into an instance of another class.
Inheritance is useful, but we need to redesign the class structure!

The two kinds of sensor are, well, kinds of sensor. What relationship does that indicate? A common superclass (or interface).
a better approach: a new base class

RemoteSensor
previousReading

ActiveSensor
range operationalState
activate monitor assess

Problem Interval
timeDetected worstValue timeCorrected
getDuration

Pull what is common to two kinds of thing into a superclass that represents the common thing.

Inheritance 101.
You can do this while creating a design from scratch.

You can do this when re-designing a system in response to change. This is a daily practice in the agile approaches to software development. Those folks call it refactoring. We will discuss this practice more next week.
design heuristic

a commonsense rule intended to increase the probability of solving some problem
last time, some heuristics for the use of inheritance
more general...
system topology
heuristics

a heuristic: distribute intelligence horizontally as uniformly as possible
an example: room temperature monitor
tongue–in–cheek heuristic
beware action as object

a heuristic: distribute intelligence horizontally as uniformly as possible

an example: room temperature monitor

tongue–in–cheek heuristic
distribute action uniformly

'before'

- Furnace
- Heat Flow Regulator
  - Temperature Sensor
  - Occupancy Sensor
  - Desired Temp Panel

Panel
distribute action uniformly

after Step 1
distribute action uniformly

after Step 2

Furnace → Heat Flow Regulator → Room
  - Temperature Sensor
  - Occupancy Sensor
  - Desired Temp Panel

God classes: data or behavior

tongue-in-cheek heuristic: choose n-1
<proxy exercise>

on paper...
dates of interest

10/26/09  →  10/30/09
10/27/09  →  11/03/09
10/29/09  →  11/05/09

*** postponing things by a week ***

Friday: project designs are due (or: iteration 2 is due)

Tuesday: discuss designs in class ... informal presentations

Thursday: midterm exam