Description of Assignment

A principle is a guideline or "rule of thumb" that is nearly universally applicable. Principles can be either prescriptive (they tell you how to do something) or descriptive (they describe a situation). Over the course of the semester, you will create the first entries in your own personal journal of policy principles that you will reference throughout the course of your career. Begin by writing down principles you observe or discern from the readings, guest lecturers and class discussions. The deliverable for this assignment is to pick 8-10 principles you have uncovered during the semester. For each principle, come up with a shorthand name for it, state the principle in no more than 1-2 sentences, and then elaborate on it further in a short paragraph. In the elaboration, you may wish to explain the principle in more detail if needed, give an example of it, say where or how you discovered this principle, what/who inspired it, what situations it would be most useful for, etc. – whatever would be most helpful to you in remembering all the richness that is embodied in the principle.

Deliverable

2-3 of these principles will be due in class October 18th, and the remaining 6-8 principles will be due at the end of the semester, as indicated in the syllabus.

Some suggestions on designing your policy principles:

Principles should be strongly stated, almost like a hypothesis, and framed in a way that you can do thought experiments to validate or invalidate the principle. Principles are statements of universal truth. Thus when you do thought experiments against your principle, you are chiefly looking for "violations" where your principle wouldn't be true. This is how you know when you've actually stumbled upon a principle that will always work for you and serve you well in your career, instead of case- or context-specific guidance that would break down with a change in environment, etc.

Example of a Good Principle

Shorthand tagline for principle:
If the politics don't fly, the system never will

Statement of the principle:
The ultimate success of a large, complex, engineering system is determined at least as much – and often more – by social and political factors as by technical performance.

Elaboration:
This descriptive principle comes directly from Brenda Forman in her excellent chapter entitled "The political process and systems architecting" in the book *The Art of Systems Architecting* by

Maier and Rechtin. Potent historical technology-based examples of this principle include the case of the Super Conducting Super Collider (SCSC) and the Space Exploration Initiative (SEI) of the early 1990s. The SCSC did not have a strong constituency of scientists, and the funds spent on the program would be largely concentrated in a few Congressional districts. The SEI was too expensive, and could not be justified in an era of declining budgets and post-Cold War peace. Examples from my own career include the rejection of innovative out-of-the-box space system architectures by Jimmy Hill and the other legacy grey beard "men who made the box." To think about this principle in a prescriptive manner might yield the advice "Always consider social and political factors in evaluating and selecting engineering system designs."