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We would like to describe a possible strategy to deal with quadratic cost functionals in the gradient under linear state laws in optimal design. We will try to emphasize:

1. General quadratic cost functionals, not necessarily positive definite.
2. General linear state laws, not necessarily elliptic, so that some dynamical situations can also be accommodated.
3. Treatment independent of dimension.

In particular, two specific situations can be analyzed in full: one for a typical elliptic equation in conductivity, and one under a wave equation as state law. (Received July 25, 2006)