Collection of Black Snakes from highways

- There exists political/social hue and cry about danger of exploded remnants of class-8 truck and trailer tires, brought to a head by several recent fatal accidents
- Trucking industry desires to get ahead of the PR problem by taking lead on investigating solutions, favoring proposals least onerous to industry
- You are tasked to develop black snake gathering device (post-explosion)

Assignment. Determine:
1. Users (or ‘customers’: operators in different duty cycles; owners; maintainers; distributors; society – be specific as to who users are and what their stake is)
2. Needs (or ‘customer requirements’: first list individually for each user, then create a combined and summarized set of needs)
3. Functional requirements (mechanical actions which device must perform; first list FR’s for each need (what functions enable satisfaction of the need), then create combined and summarized set of functional requirements)
4. Consider:
   a. Users, needs, and functional requirements must be independent of form (i.e. must not suggest how a design solution (device) might be configured or equipped).
   b. Needs and functional requirements are qualitative (not numerical).
   c. Summarized lists of needs and functional requirements must be lean – necessary to satisfy users, also sufficient to satisfy users – no more, no less. Focus on significant issues (to keep key form-determiners in view), and avoid matters of normal good mechanical design (like robustness) unless there is a need for an extraordinary level.
5. Beware – simple regurgitation of the problem as stated above will not be sufficient to meet any purpose (i.e. tell us something that isn’t already written – add value).
6. Note – hard to create an expert design without attaining some state of expertise. Expect to do a fair amount of gathering of domain knowledge. Not at all a bad idea to summarize what you found out.

Notes on presentation for MECH 3200:
- Be concise. It is harder to craft a technical brief that can be picked up at a glance than it is to ramble on in pages of dense prose. You are expected to accomplish the former.
- Be complete. Since there is no one correct answer to a design problem, and every answer must be proven by a logical case, simple statement of your ‘answer’ is insufficient. You need to back it up.