

Getting a quick handle on major site hazards

1. Go to the regulation under Section 200 of the Canadian Environmental Protection Act (CEPA) <http://www.cepa2.ec.gc.ca> and refer to the list of substances available from the above web page or in Schedule 1 of the regulations. Are any of these likely to be present on site in more than the threshold quantity shown? Also consider whether you have other chemical inventories that could have adverse offsite impact. If so, continue to step 2.
2. Divide the site into areas for hazard review, using the plot plan. Screen to determine scope of review by examining each area for serious hazard potential (consider what *could* be on site, not just what is usually there)
3. Look at the worst case scenario(s) for impacts, offsite and on site. Scenarios can be analyzed using various tools.
 - The Dow Fire and explosion index, (F&EI)
Available from the AICHE @ www.aiche.org
 - The Dow Chemical Exposure Index (CEI)
Available from the AICHE @ www.aiche.org
 - The US EPA has a simple consequence analysis screening tool (RMP-Comp) that can be down loaded and used to determine the potential impact of various scenarios.
Available from the US EPA web address;
<http://yosemite.epa.gov/oswer/Ceppoweb.nsf/content/rmp-comp.htm>
4. Suggested criteria for further study of hazards:

For fire or explosion hazards consider further study when;

- Dow Fire and explosion index, (F&EI) is 128 or higher,
- or when overpressure is 7 KPa or higher, at vulnerable building locations,
- or for fire hazards, when radiation to people is 4.7 kWm^{-2} for 40 seconds (or equivalent thermal load) or higher, or radiation to buildings is 12.6 kWm^{-2} or higher.

For toxic hazards consider further study when;

- the Dow Chemical Exposure Index (CEI) is 200 or higher,
- or when distance from the event centre to significant off site populations such as a residential area is less than the HD2 distance; where HD2 is the distance corresponding to an ERPG2 (Emergency Response Planning Guide 2) concentration as calculated using the Dow CEI guide or the EPA RMP-Comp tool, or other methods,
- or when distance from the event centre to any off site population is less than the HD3 distance; where HD3 is the distance corresponding to an ERPG3 (Emergency Response Planning Guide 3) concentration as calculated using the Dow CEI guide or other methods,

- or if the potential impact on personnel or the environment is otherwise significant.
5. If any of the above criteria are met prioritize operating units for more detailed hazard review using a suitable risk matrix.
 6. Use HAZOP (or similar hazardous scenario identification technique) on critical processes (equipment, etc.), supplemented by checklist in Appendix B of CCPS *Guidelines for Hazard Evaluation Procedures* (reference)
 7. Once all significant hazards have been identified in the high risk process areas, complete an assessment to ensure that the hazard has been appropriately mitigated using sufficient protection systems. This can be part of the HAZOP process where the risk is assessed as scenarios are identified, or use a layer of protection analysis (LOPA) to more systematically determine whether sufficient independent protection layers have been employed. See text Layer of Protection Analysis - Simplified Process Risk Assessment **AICHE/CCPS - Center for Chemical Process Safety 2001.**