FACILITY SITING CHECKLIST

I. Space Between Process Components

No.	Question	Response	Recommendations
1.	Have adequate provisions been made for relieving explosions in process equipment?		
2.	Are operating units and the equipment within units spaced to minimize potential damage from fires or explosions in adjacent areas?		
3.	Are there safe exit routes from each unit?		
4.	Has equipment been adequately spaced and located to safely permit anticipated maintenance (e.g., pulling heat exchanger bundles, dumping catalyst, lifting with cranes) and hot work?		
5.	Are vessels containing highly hazardous chemicals located sufficient far apart? If not, what hazards are introduced?		
6.	Is there adequate access for emergency vehicles (e.g., fire trucks)?		
7.	Can adjacent equipment or facilities withstand the overpressure generated by potential explosions?		
8.	Can adjacent equipment and facilities (e.g., support structures) withstand flame impingement?		

II Location of Large Inventories

No.	Question	Response	Recommendations
1.	Are large inventories of highly hazardous chemicals located away from the process area?		
2.	Is temporary storage provided for raw materials and for finished products at appropriate locations?		
3.	Are the inventories for highly hazardous chemicals held to a minimum?		
4.	Where applicable, are reflux tanks, surge drums, and rundown tanks located in a way that avoids the concentration of large volumes of highly hazardous chemicals in any one area?		
5.	Where applicable, has special consideration been given to the storage and transportation of explosives?		
6.	Have the following been considered in the location of material handling areas:		
	fire hazards?		
	location relative to important buildings?		
	safety devices (e.g., sprinklers)?		
	slope of the area (is it level)?		

III. Location of the Motor Control Center

No.	Question	Response	Recommendations
1.	Is the motor control center (MCC) located so that it is easily accessible to operators?		
2.	Are circuit breakers easy to identify?		
3.	Can operators safety open circuit breakers? Have they been trained?		
4.	Is the MCC designed such that it could not be an ignition source? Are the doors always closed? Is a no-smoking policy strictly enforced?		
5.	Is the MCC designed and meant to be a safe haven?		

IV Location and Construction of the Control Room(s)

No.	Question	Response	Recommendations
1.	Is the control room built to satisfy current corporate overpressure and safe-haven standards?		
2.	Does the construction basis for the control room satisfy acceptable criteria (e.g., the Factor Mutual recommendations)?		
3.	Are the workers in the control room (or escape routes from the control room) protected from all of the following?		
	toxic, corrosive, or flammable sprays, fumes, mists, or vapors?		
	thermal radiation from fires (including flares)?		
	overpressure and projectiles from explosions?		
	contamination from spills or runoff?		
	noise?		
	contamination of utilities (e.g., breathing air)?		
	transport of hazardous materials from other sites?		
	possibility of long-term exposure of employees to low concentrations of process material?		
	odors?		
	impacts (e.g., from a forklift)?		
	flooding (e.g., ruptured storage tanks)?		

IV Location and Construction of the Control Room(s) *(continued)*

No.	Question	Response	Recommendations
4.	Are vessels containing highly hazardous chemicals located sufficiently far from the control room?		
5.	Were the following characteristics considered when the control room location was determined:		
	types of construction of the room?		
	types/quantities of materials?		
	direction and velocity of prevailing winds?		
	types of reactions and processes?		
	operating pressures and temperatures?		
	ignition sources?		
	fire protection facilities?		
	drainage facilities?		
6.	If windows are installed, are they of rigid construction with sturdy panes (e.g., woven-wire reinforced glass)?		
7.	Is at least one exit located in a direction away from the process area? Do exit doors open outward? Are emergency exits provided for multistory control buildings?		
8.	Are the ends of the horizontal vessels facing away from the control rooms?		

IV Location and Construction of the Control Rooms (s) *(continued)*

No.	Question	Response	Recommendations
9.	Are critical pieces of equipment in the control room well protected? Is adequate barricading provided for the control room?		
10.	Are open pits, trenches, or other pockets where inert, toxic, or flammable vapors could collect located away from control buildings or equipment handling flammable fluids?		
11.	Where piping, wiring, and conduit enter the building, is the building sealed at the point of entry? Have other potential leakage points into the building been adequately sealed?		
12.	Is the control room located a sufficient distance from sources of excessive vibration?		
13.	Is a positive pressure maintained in control rooms located in hazardous areas?		
14.	Could any structures fall on the control room in the event of an accident?		
15.	Is the roof of the control room free from heavy equipment and machinery?		

V. Location of Machine Shops, Welding Shops, Electrical Substations, Roads, Rail Spurs, and Other Likely Ignition Sources

No.	Question	Response	Recommendations
1.	Are likely ignition sources (e.g., maintenance shops, roads, rail spurs) located away from release points for volatile substances (both liquid and vapor)?		
2.	Are process sewers located away from likely sources of ignition?		
3.	Are all vessels containing highly hazardous chemicals or components containing material above its flash point located away from likely sources of ignition?		
4.	Are the flare and fired heater systems located to minimize hazards to personnel and equipment, with consideration given to normal wind direction and wind velocity, as well as heat potential?		

VI. Location of Engineering, Lab, Administration, or Other Buildings

No.	Question	Response	Recommendations
1.	Are administration buildings located away from inventories of highly hazardous chemicals?		
2.	Are administration buildings located away from release points for highly hazardous chemicals?		
3.	Are workers in administration buildings protected from all of the following:		
	toxic, corrosive, of flammable sprays, fumes, mists, or vapors?		
	thermal radiation from fires (including flares)?		
	overpressure and projectiles from explosions?		
	contamination of utilities (e.g., water)?		
	contamination from spills or runoff?		
	noise?		
	transport of hazard materials from other sites?		
	flooding (e.g., ruptured storage tanks)?		

VII. Unit Layout

No.	Question	Response	Recommendations
1.	Are large inventories or release points for highly hazardous chemical located away from vehicular traffic within the plant?		
2.	Could specific siting hazards be posed to the site from credible external forces such as high winds, earth movement, utility failure from outside sources, flooding, natural fires, and fog?		
3.	Is there adequate access for emergency vehicles (e.g., fire trucks)? Are access roads free of the possibility of being blocked by trains, highway congestion, spotting of rail cars, etc.?		
4.	Are access roads well engineered to avoid sharp curves? Are traffic signs provided?		
5.	Is vehicular traffic appropriately restricted from areas where pedestrians could be injured or equipment damaged?		
6.	Are cooling towers located such that fog that is generated by them will not be a hazard?		
7.	Are the ends of horizontal vessels facing away from personnel areas?		
8.	Is hydrocarbon-handling equipment located outdoors?		

VII. Unit Layout *(continued)*

No.	Question	Response	Recommendations
9.	Are pipe bridges located such that they are not over equipment, including control rooms and administration buildings?		
10.	Is piping design adequate to withstand potential liquid loads?		

VIII. Location of Unit Relative to Onsite and Offsite Surroundings

No.	Question	Response	Recommendations
1.	Is a system in place to notify neighboring units, facilities, and residents if a release occurs?		
2.	Are there detection systems and/or alarms in place to assist in warning neighboring units, facilities, and residents if a release occurs?		
3.	Do neighbors (including units, facilities, and residents) know how to respond when notified of a release? Do they know how to shelter in place and when to evacuate?		
4.	Are large inventories or release points for highly hazardous chemicals located away from publically accessible roads?		
5.	Is the unit, or can the unit be, located to minimize the need for offsite or intrasite transportation of hazardous materials?		

VIII. Location of the Unit Relative to Onsite and Offsite Surroundings *(continued)*

No.	Question	Response	Recommendations
6.	Are workers in adjacent units and neighboring plants, and the public and environmental receptors, protected from all of the items listed below? In addition, are workers in this unit protected from the effects of adjacent units or facilities for all of the items listed below?		
	releases of highly hazardous chemicals?		
	toxic, corrosive, or flammable sprays, fumes, mists, or vapors?		
	thermal radiation from fires (including flares)?		
	overpressure from explosions?		
	contamination from spills or runoff?		
	odors?		
	contamination of utilities (e.g., sewers)?		
	transport of hazardous materials from other sites?		
	impacts (.e.g., airplane crashes, derailments)?		
	flooding (e.g., ruptures storage tank)?		

IX. Location of Firewater Mains and Backup (e.g., Diesel) Pumps

No.	Question	Response	Recommendations
1.	Are firewater mains easily accessible?		
2.	Are firewater mains and pumps protected from overpressure and blast debris impact?		
3.	Is an adequate supply of water available for firefighting?		
4.	Are the firehouse doors pointed away from the process area so the doors will not be damaged by an explosion overpressure?		

X. Location and Adequacy of Drains, Spill Basins, Dikes, and Sewers

No.	Question	Response	Recommendations
1.	Are spill containments sloped away from process inventories and potential sources of fire?		
2.	Have precautions been taken to avoid open ditches, pits, sumps, or pockets where inert, toxic, or flammable vapors could collect?		
3.	Are process sewers that transport hydrocarbon closed systems?		
4.	Are concrete bulkheads, barricades, or berms installed to protect personnel and adjacent equipment from explosion and/or fire hazards?		

X. Location and Adequacy of Drains, Spill Basins, Dikes, and Sewers *(continued)*

No.	Question	Response	Recommendations
5.	Are vehicle barriers installed to prevent impact to critical equipment adjacent to high traffic areas?		
6.	Do drains empty to areas where material cannot pool?		
7.	Can dikes hold the capacity of the largest tank?		
8.	Is there a means of access in and out of dikes, pits, etc.?		

XI. Location of Emergency Stations (Showers, Respirators, Personal Protective Equipment, etc.)

No.	Question	Response	Recommendations
1.	Are emergency stations easily accessible?		
2.	Are first aid stations prudently located and adequately equipped?		
3.	Are safety showers heated/freeze protected/wind protected?		
4.	Is there a control room alarm?		

XII. Electrical Classification

No.	Question	Response	Recommendations
1.	Is there an electrical classification document?		
2.	Does the electrical classification appear correct and complete?		
3.	Has the electrical classification document been recently revised?		
4.	Have significant changes made since the system was originally constructed been included in the electrical classification document?		
	addition of new materials?		
	new sources of flammable gases or vapors?		
	new low points (e.g., sumps or trenches) at grade?		
	areas that have been enclosed since the system was constructed?		
5.	Are the design and maintenance of ventilation systems adequate?		
	safeguards to alert operators when a ventilation system fails?		
	ventilation systems being properly maintenance, and alarms and interlocks on these systems periodically function checked?		
	adequate maintenance being done to function check natural ventilation systems?		

XII. Electrical Classification *(continued)*

No.	Question	Response	Recommendations
	technical basis for design changes to the ventilation system?		
	ventilation systems verified to be adequate for new gas or vapor loads?		
6.	Are there adequate controls to ensure that electrically qualified equipment is replaced with equipment of equal or higher classification?		
7.	Are boundaries between electrically classified areas physical boundaries? If not:		
	are the boundaries marked?		
	are workers adequately informed of the boundaries of electrically classified areas and their significance?		
8.	Are Division 1 areas necessary (if there are any)?		
9.	Are there adequate controls (e.g., a hot work permit system) on repair and construction activities, including work by contractor personnel?		
10.	Does the electrical classification adequately reflect the effects of different modes of operation (e.g., normal operation, maintenance, startup, infrequent operating modes such as reactor regeneration or operation with a portion of the system bypassed)?		

XIII. Contingency Planning

No.	Question	Response	Recommendations
1.	What expansion or modification plans are there for the facility?		
2.	Can the unit be built and maintained without lifting heavy items over operating equipment and piping?		
3.	Are calculations, charts, and other documents available that verify facility siting has been considered in the layout of the unit? Do these documents show that consideration has been given to:		
	normal direction and velocity of wind?		
	atmospheric dispersion of gases and vapors?		
	estimated radiant heat density that might exist during a fire?		
	estimated overpressure?		
4.	Are appropriate security safeguards in place (e.g., fences, guard stations)?		
5.	Are gates located away from the public roadway so that the largest trucks can move completely off the roadway while waiting for the gates to be opened?		
6.	Where applicable, are safeguards in place to protect high structures against low-flying aircraft?		

XIII. Contingency Planning *(continued)*

No.	Question	Response	Recommendations
7.	Are adequate safeguards in place to protect employees against exposure to excessive noise, considering the cumulative effect of equipment items located close together?		
8.	Is adequate emergency lighting provided? Is there adequate redundant backup power for this lighting?		
9.	Are procedures in place to restrict nonessential or untrained personnel from entering areas deemed to be hazardous?		
10.	Are indoor safety control systems (e.g., sprinklers, fire walls) provided in buildings where personnel will frequently be located, such as control rooms and administrative buildings?		
11.	Are evacuation plans (from buildings, units, etc.) adequate and accessible to personnel?		
12.	Are evacuation drills routinely conducted?		