

ORANGE COUNTY FIRE AUTHORITY

HUMAN FACTORS REVIEW CHECKLIST for Compliance with OSHA 1910.119

A. Operator/Process Interface

- Is process control instrumentation clear?
- Is operating information accessible?
- Are displays of process control instrumentation clearly identified?
- Are there adequate process control displays?
- If displays are shared with another unit, does it cause any problem at times?
- Are computer displays clearly formatted?
- Are the effects of changes to process control operations clearly defined to the process control operator?
- Does instrument layout minimize chance of error?
- Will the keys for locked control functions be readily available during an emergency? (The items in question are the control functions that are generally locked during normal operation but may be required in a plant upset.)
- Are shutdown switches and other controls required for emergency operation readily accessible to the operator from a safe location?
- Are valves and piping clearly labeled and identified to avoid wrong line up?

B. Automatic Control versus Manual Control

- How automated is the process control system at present: over, under, or proper?
- Will any greater degree of automation be required to make the process safer?
- Will increased automation make the process more complex?

C. Task Design and Job Organization

- Is the operator likely to be overloaded during a process upset in the unit?
- Is the operator's length of shifts and rotation time acceptable?
- Are the operator's individual responsibilities clearly defined?
- Is there a team responsibility for operating the unit?
- Is operator assistance readily available during an upset?
- Is the operator also an emergency responder?
- Is there backup assistance available when an operator must respond to an emergency?
- Is there a program for incident investigation and follow-up?

D. Work Place and Working Environment

- Are there physical obstacles or discomforts for prolonged periods associated with operator's movement in the plant area (e.g., poor accessibility of equipment, slip/trip hazards, narrow and low crawl space, etc.) during normal operation?
- Are environmental conditions (e.g., illumination, noise, temperature, and/or humidity) satisfactory?
- Handrails, stairs, steps, platforms are in good condition and do not present a hazard.
- Are confined spaces in the Unit clearly marked such as vessel skirts ?

E. Training

- Are training requirements for operating the unit defined?
- Are training methods developed?
- Are the process control operators and field operators cross-trained?

- Are operator's training records up to date?
- Is there continuous and/or refresher training?

F. Procedures

- Are procedure manuals readily available?
- Are the procedure manuals updated periodically?
- Are procedures clear and concise?
- Are additional procedures required?

**CONTROL ROOM/OPERATOR SHELTER
FACILITY SITING REVIEW CHECKLIST**

A. Building and Structure

- Type of structure reviewed.
- Distance between structure and process equipment?
- Distance between structure and storage of toxic chemicals (if present)?
- Is the building of blast-resistant design?
- What construction materials have been used for the building?
- What design standards have been followed for the construction of the building?
- Are the windows made of safety glass?
- Are the window sashes and frames reinforced?
- How many general exit and escape routes available?
- Are doors and windows hung to avoid projecting into or blocking walkways and exits?
- Is structural steel grounded?
- What is the electrical classification for the building?
- Is the building pressurized in accordance with National Fire Protection Association (NFPA) 496?
- Is there an evacuation plan in place for all nonessential personnel per Federal OSHA code 29 CFR 1910.38a?
- Are self-contained breathing tanks provided for essential personnel?
- Is the building provided with early warning of toxic material intrusion via appropriate monitors?

B. Floor Drains

- Are floor drains plugged?
- Are necessary drains provided with liquid seals (e.g., sinks, showers)?
- Is outfall of sanitary sewer maintained at atmospheric pressure by routing to a vented manhole, thereby assuring high liquid levels during heavy rain will not back process materials into building?

C. Wall Penetrations

- What piping are connected into the building, such as water, steam, air, waste?
- Is there any process material piped into the building?
- Do all electrical conduits have internal seals at point of entry?
- Are all wall penetrations weather sealed?

D. Vapor Intrusion

- Is the heating, ventilating, and air conditioning (HVAC) system air intake located at an elevated point, typically 25 feet above grade?
- Is the building pressurization system working properly?

- How often is the pressurization/HVAC system tested?

E. Liquid Process Leak

- Are berms, curbing, or surface grade sloped to prevent liquid spills from draining toward building?

F. Fire Control

- Do procedures exist to prohibit sample material from being brought into the control room building?
- Does the building contain a lab?
- If it does, are there appropriate fire control procedures in place?
- Are fire extinguishers available inside the building?