Process Hazard Analysis Human Factors Checklist

Facility: _____

Date: _____

Team Members: _____

Item	Question	Answer (Y, N, N/A)	Justification	Recommendations
HOUSEKEEPING AND GENERAL WORK ENVIRONMENT				
1.	Are working areas generally clean?			
2.	Is normal and emergency lighting sufficient for all area operations?			
3.	Is there adequate backup power for emergency lighting?			
4.	Are provisions in place to limit the time a worker spends in an extremely hot or cold area?			
5.	Are employees protected from excessive noise (e.g., the noise does not affect mental workload and cognitive ability as opposed to physical harm – "It is so loud I cannot concentrate")?			
6.	Are alarms audible above background noise both inside the control room and in the process area?			
7.	Are adequate signs posted near maintenance, cleanup, or staging areas to warn workers of special or unique hazards associated with the areas?			
ACCESSIBILITY / AVAILABILITY OF CONTROLS AND EQUIPMENT				
8.	Are all controls accessible?			
9.	Is communications equipment adequate, easily accessible, and functional?			
10.	Is emergency equipment accessible without presenting further hazards to personnel?			
11.	Are adequate supplies of protective gear readily available and in good working condition for routine and emergency use?			
12.	Would others quickly know if a worker is incapacitated in a process area?			

Item	Question	Answer (Y, N, N/A)	Justification	Recommendations
13.	Is the workplace arranged so that workers can maintain a good working posture while performing necessary movements to conduct routine tasks?			
14.	Can operators/maintenance workers safely perform all required routine/ emergency actions, considering the physical arrangement of equipment (e.g., access to equipment, or proximity of tasks to rotating equipment, hot surfaces, and hazardous discharge points)?			
15.	Are valves that require urgent manual adjustments (e.g., emergency shutdown) easily identifiable and readily accessible?			
16.	Are the right tools (including special tools) available and used when needed?			

LABELING

Item	Question	Answer (Y, N, N/A)	Justification	Recommendations
17.	Has responsibility for maintaining and updating labels been assigned?			
18.	Does the labeling program include components (e.g., small valves) that are mentioned in the procedures even if they are not assigned an equipment number?			
19.	Are all important equipment (vessels, pipes, valves, instruments, controls, etc.) legibly, accurately, and unambiguously labeled?			
20.	Are remote startup/shutdown switches clearly labeled and protected from inadvertent operation?			
21.	Are emergency exit and response signs (including wind socks) adequately visible and easily understood?			
22.	Are signs that warn workers of hazardous materials or conditions adequately visible and easily understood?			

FEEDBACK / DISPLAYS / CONTROLS

Item	Question	Answer (Y, N, N/A)	Justification	Recommendations
23.	Are the displays adequately visible from all relevant working positions?			
24.	Do separate displays present similar information in a consistent manner?			

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Item	Question	Answer (Y, N, N/A)	Justification	Recommendations
25.	Do the displays give adequate feedback for all operational actions?			
26.	Does the computer check that values entered by operators are within a valid range?			
27.	Is adequate information about normal and upset process conditions clearly displayed in the control room?			
28.	Are the alarms displayed by priority?			
29.	Is an alarm summary permanently on display?			
30.	Are critical safety alarms easily distinguishable from control alarms?			
31.	Are nuisance alarms corrected and redundant alarms eliminated as soon as practical to help prevent complacency toward alarms?			
32.	Are automatic safety features provided when a process upset requires rapid response?			
33.	Are automatic safety features provided when a process upset may be difficult to diagnose due to complicated processing of various information?			
34.	Is the layout of the consoles logical, consistent, and effective?			
35.	Are the controls distinguishable, accessible, and easy to use?			
36.	Do all controls meet standard expectations (color, direction of movement, etc.)?			
37.	Do the control panel layouts reflect the functional aspects of the process or equipment?			
38.	Does the control arrangement logically follow the normal sequence of operation?			
39.	Can operators safely intervene in computer-controlled processes?			
40.	Can process variables be adequately controlled with the existing equipment?			
41.	Do operators believe that the control logic and interlocks are adequate?			
42.	Does a dedicated emergency shutdown panel exist? If so, is it in an appropriate location?			
43.	Are instruments, displays, and controls promptly repaired after a malfunction?			

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Item	Question	Answer (Y, N, N/A)	Justification	Recommendations
44.	Do administrative features exist that govern when instruments, displays, or controls are deliberately disabled or bypassed and that govern their return to normal service at the appropriate time?			
45.	Does a formal mechanism exist for correcting human factors deficiencies identified by the operators (e.g., modifications to the displays, controls, or equipment to better meet operators' needs)?			

PROCEDURES

Item	Question	Answer (Y, N, N/A)	Justification	Recommendations
46.	Do written procedures exist for all operating phases (i.e., normal operations, temporary operations, emergency shutdown, emergency operation, normal shutdown, and startup following a turnaround or after an emergency shutdown)?			
47.	Are safe operating limits documented, providing consequences of deviating from limits and actions to take when deviations occur?			
48.	Are programs adequate to maintain procedures current and to ensure that employees are only using the current procedures?			
49.	Do operators believe that the procedure format and language are easy to follow and understand?			
50.	Are the procedures accurate (i.e., do they reflect the way in which the work is actually performed)?			
51.	Do the procedure titles accurately describe the nature of the procedure?			
52.	Is each step of the procedure written as a command?			
53.	Are separate procedure steps used for each action instead of burying multiple actions in the text of a single step?			
54.	Is each procedure step specific enough to leave no room for interpretation (e.g., no vague word meanings, desired quantity or value clear, to what equipment the step applies)?			
55.	Are note, warning, and caution statements used appropriately (e.g., listed before the applicable procedure step and do not include actionable steps themselves)?			

Item	Question	Answer (Y, N, N/A)	Justification	Recommendations
56.	If procedures require calculations, are the steps to perform the calculations clear and easy to understand?			

WORKLOAD AND STRESS FACTORS

Item	Question	Answer (Y, N, N/A)	Justification	Recommendations
57.	Are the number and frequency of manual adjustments required during normal and emergency operations limited so that operators can make the adjustments without a significant chance of mistakes as a result of overwork or stress?			
58.	Is the number of manual adjustments during normal operations sufficient to avoid mistakes as a result of boredom?			
59.	Have the effects of shift duration and rotation been considered in establishing workloads?			
60.	Is the number of extra hours an operator must work if his or her relief fails to show up sufficiently limited so that worker safety is not adversely affected?			
61.	Is the number of hours an operator or maintenance worker must work during startup or turnarounds sufficiently limited so that worker safety is not adversely affected?			
62.	Can additional operators (e.g., from other areas or from offsite) be called in quickly to help during an emergency?			
63.	Is the staffing level appropriate for all modes of operation (normal, emergency, etc.)?			
64.	Are shift turnover communications adequate to communicate plant operating conditions from off-shift to on-shift personnel?			
65.	Are shift turnover communications maintained in an accessible log?			

TRAINING

Item	Question	Answer (Y, N, N/A)	Justification	Recommendations
66.	Have personnel involved with completing this human factors checklist been trained such that they have a basic understanding of human factors?			
67.	Is all training consistent with the written procedures?			

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Item	Question	Answer (Y, N, N/A)	Justification	Recommendations
68.	Does operator and maintenance worker training include training in appropriate emergency response?			
69.	Do operators practice emergency response while wearing emergency protective equipment?			
70.	Are periodic emergency drills conducted?			
71.	Are emergency drills witnessed by observers and critiqued?			
72.	Is special or refresher training provided in preparation for an infrequently performed operation?			
73.	When changes are made, are workers trained in the new operation, including an explanation of why the change was made and how worker safety can be affected by the change?			
74.	Do operators and maintenance workers receive adequate training in safely performing their assigned tasks before they are allowed to work without direct supervision?			
75.	Are operators and maintenance workers trained to request assistance when they believe they need it to safely perform a task?			
76.	Are operators trained to shut down the process when in doubt about whether it can continue to operate safely?			

Data sources:

ABS Consulting, Human Factors Checklist

AcuTech Process Risk Management, Human Factors Checklist

Bridges, Bill, "Human Factors Elements Missing from Process Safety Management (PSM)", March 2010

Contra Costa County Latent Conditions Checklist

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