

HEART Worksheets

Initial event 1.3

Task			
1 - Truck parking			
Description			
Field operator tells to truck driver to park the truck close to the tank that requires refilling			
Generic Task Unreliability			
Routine, highly practised, rapid task involving relatively low level of skill		0.02	
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
Disruption of normal work-sleep cycles	1.1	0.3	1.03
Task pacing caused by the intervention of others	1.06	0.4	1.024
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability		2.11E-02	

Initial event 1.4

Task			
6 - Hose connection			
Description			
Field operator connects the flexible hose and verify that it is well connected			
Generic Task Unreliability			
Restore or shift a system to original or new state following procedures, with some checking	0.003		
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
Task pacing caused by the intervention of others	1.06	0.3	1.018
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	3.05E-03		

Initial event 1.5

Task			
Intervention in case of liquid spillage			
Description			
Liquid unloading is a manned operation and in case of liquid spillage the operator can immediately detect it and consequently stop transferring pump and close valves			
Generic Task Unreliability			
Restore or shift a system to original or new state following procedures, with some checking		0.003	
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
A shortage of time available for error detection and correction	11	0.5	6
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	1.80E-02		

Initial event 1.6

Task			
Second operator (truck driver) monitors			
Description			
Liquid unloading is a manned operation and in case of liquid spillage the operator can immediately detect it and consequently stop transferring pump and close valves			
Generic Task Unreliability			
Restore or shift a system to original or new state following procedures, with some checking		0.003	
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
A shortage of time available for error detection and correction	11	0.5	6
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	1.80E-02		

Initial event 2.2

Task			
Field operator connect balancing line			
Description			
Before starting the unloading procedure, and after open of on/off valve on roof tank, field operator connect the balancing line to truck and tank in order to allow the liquid transfer			
Generic Task Unreliability			
Restore or shift a system to original or new state following procedures, with some checking		0.003	
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
Task pacing caused by the intervention of others	1.06	0.3	1.018
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	3.05E-03		

Initial event 2.3

Task			
Field operator intervene on high pressure alarm on Tank			
Description			
In case of high pressure alarm on Tank the operator stops the transferring operation			
Generic Task Unreliability			
Restore or shift a system to original or new state following procedures, with some checking		0.003	
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
A channel capacity overload, particularly one caused by simultaneous presentation of non-redundant information	6	0.5	3.5
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	1.05E-02		

Initial event 3.2

Task			
Connect earthing to truck			
Description			
Before starting the unloading procedure the field operator connects the truck to the earthing connection in order to prevent static electricity			
Generic Task Unreliability			
Restore or shift a system to original or new state following procedures, with some checking		0.003	
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
Task pacing caused by the intervention of others	1.06	0.2	1.012
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	3.04E-03		

Initial event 3.3

Task			
Field operator connect balancing line			
Description			
Before starting the loading procedure, and after open of on/off valve on roof tank, field operator connect the balancing line to truck and tank in order to allow the liquid transfer			
Generic Task Unreliability			
Restore or shift a system to original or new state following procedures, with some checking		0.003	
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
Task pacing caused by the intervention of others	1.06	0.3	1.018
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	3.05E-03		

Initial event 4.2

Task			
Field operator connect balancing line			
Description			
Before starting the unloading procedure, and after open of on/off valve on roof tank, field operator connect the balancing line to truck and tank in order to allow the liquid transfer			
Generic Task Unreliability			
Restore or shift a system to original or new state following procedures, with some checking		0.003	
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
Task pacing caused by the intervention of others	1.06	0.3	1.018
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	3.05E-03		

Initial event 4.3

Task			
Field operator intervene on high pressure alarm on Tank			
Description			
In case of low pressure alarm on Tank the operator stops the transferring operation			
Generic Task Unreliability			
Restore or shift a system to original or new state following procedures, with some checking		0.003	
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
A channel capacity overload, particularly one caused by simultaneous presentation of non-redundant information	6	0.5	3.5
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	1.05E-02		

Initial event 5.2

Task			
Field operator checks level inside tanker			
Description			
During the unloading operations field operator checks the level in the tank in order not to exceed maximum allowable liquid level			
Generic Task Unreliability			
Completely familiar, well designed, highly practised, routine task occurring several times per hour		0.0004	
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
Little or no independent checking or testing of output	3	0.5	2
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	8.00E-04		

Initial event 5.3

Task			
Field operator intervene on high level alarm on Tank			
Description			
In case of high level alarm on Tank the operator stops the transferring operation			
Generic Task Unreliability			
Restore or shift a system to original or new state following procedures, with some checking		0.003	
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
A channel capacity overload, particularly one caused by simultaneous presentation of non-redundant information	6	0.5	3.5
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	1.05E-02		

Initial event 6.2

Task			
Field operator connect balancing line			
Description			
Before starting the loading procedure, and after open of on/off valve on roof tank, field operator connect the balancing line to truck and tank in order to allow the liquid transfer			
Generic Task Unreliability			
Restore or shift a system to original or new state following procedures, with some checking		0.003	
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
Task pacing caused by the intervention of others	1.06	0.3	1.018
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	3.05E-03		

Initial event 6.3

Task			
Field operator intervene on high pressure alarm on Tanker			
Description			
In case of high pressure alarm on Tanker the operator stops the transferring operation			
Generic Task Unreliability			
Restore or shift a system to original or new state following procedures, with some checking		0.003	
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
A channel capacity overload, particularly one caused by simultaneous presentation of non-redundant information	6	0.5	3.5
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	1.05E-02		

Initial event 7.2

Task			
Field operator stops the loading pump			
Description			
When the level in the tank is reached field operator stops the loading pump			
Generic Task Unreliability			
Respond correctly to system command even when there is an augmented or automated supervisory system providing accurate interpretation of system stage		0.00002	
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
A mismatch between an operator's model of the world and that imagined by the designer	8	0.6	5.2
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	1.04E-04		

Initial event 7.3

Task			
Field operator intervene on high pressure alarm on Tanker			
Description			
In case of high pressure alarm on Tanker the operator stops the transferring operation			
Generic Task Unreliability			
Restore or shift a system to original or new state following procedures, with some checking	0.003		
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
A channel capacity overload, particularly one caused by simultaneous presentation of non-redundant information	6	0.5	3.5
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	1.05E-02		

Initial event 8.2

Task			
Field operator connect nitrogen blanketing line			
Description			
Before starting the loading procedure, and after open of on/off valve on roof tank, field operator connect the balancing line to truck and tank in order to allow the liquid transfer			
Generic Task Unreliability			
Restore or shift a system to original or new state following procedures, with some checking		0.003	
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
Task pacing caused by the intervention of others	1.06	0.3	1.018
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	3.05E-03		

Initial event 8.3

Task			
Field operator intervene on low pressure alarm on Tank			
Description			
In case of low pressure alarm on Tank the operator stops the transferring operation			
Generic Task Unreliability			
Restore or shift a system to original or new state following procedures, with some checking		0.003	
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
A channel capacity overload, particularly one caused by simultaneous presentation of non-redundant information	6	0.5	3.5
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	1.05E-02		

Initial event 9.2

Task			
Furnace operator error setting temperature			
Description			
Furnace operator does not regulate / adjust correctly the temperature of the furnace			
Generic Task Unreliability			
Respond correctly to system command even when there is an augmented or automated supervisory system providing accurate interpretation of system stage	0.00002		
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
Operator inexperienced (e.g. a newly qualified tradesman, but not an 'expert')	3	0.1	1.2
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	2.40E-05		

Initial event 9.3

Task			
Missing check by furnace operator			
Description			
Furnace operator does not observe air and temperature gauges or metal color and fluidity, and adjust temperature			
Generic Task Unreliability			
Respond correctly to system command even when there is an augmented or automated supervisory system providing accurate interpretation of system stage		0.00002	
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
Little or no independent checking or testing of output	3	0.1	1.2
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	2.40E-05		

Initial event 10.2

Task			
Missing check by furnace operator			
Description			
Furnace operator does not operate controls to move or discharge metal workpieces from furnaces			
Generic Task Unreliability			
Respond correctly to system command even when there is an augmented or automated supervisory system providing accurate interpretation of system stage		0.00002	
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
Little or no independent checking or testing of output	3	0.1	1.2
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	2.40E-05		

Initial event 10.3

Task			
Missing removal of molten metal by furnace operator			
Description			
Furnace operator does not operate controls to move or discharge metal workpieces from furnaces			
Generic Task Unreliability			
Respond correctly to system command even when there is an augmented or automated supervisory system providing accurate interpretation of system stage	0.00002		
Error Producing Conditions	Multiplier	Assessed Proportion of Effect	Assessed Effect
Operator inexperienced (e.g. a newly qualified tradesman, but not an 'expert')	3	0.1	1.2
Poor, ambiguous or ill-matched system feedback	4	1	4
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
	1	0	1
Human Error Probability	9.60E-05		