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Title Project : Industrial relocation

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Type : Prevention

Departement : Industrial

Undesirable Events

Code	Description
E1	Work-related illness
E2	Drop in productivity
E3	Drop in quality
E4	Inadequate design
E6	Explosion and fire
E5	Pollution
E7	.....

Factors

Code	Description
F1	Mechanical
F2	Electrical
F3	Human
F4	Physical

sources of dangers

sources of danger : F1

Code	Description
F11	Moving elements : Chucks, tools, robots, turntables, grinders, conveyer belts
F12	Handling : Bridge crane, forklit, stacker, motorized trailer
F13	Physical explosions : Dust, gas, vapor, tank depressurizing, liquid on very hot surfaces
F14	Heights : Ladders, staircases, catwalks
F15	Movement : Obstacles on the ground, slopes, openings in the ground
F16	Devices and elements under pressure : Compressors, gas cylinders, hydraulic or pneumatic lines

F17	Elements under strain
F18	staircases
F19	catwalks...

sources of danger : F2

Code	Description
F21	DC or AC electrical current
F22	Static electricity

sources of danger : F3

Code	Description
F31	Hight-risk behavior
F32	Stress
F33	Static electricity

sources of danger : F4

Code	Description
F41	Ambient lighting
F42	Video screens
F43	Ambient noise
F44	Vibrations
F45	Contact temperature
F46	Work station design
F47	Hostile environments
F48	.....

Impacts

Code	Description
IP	On performance
IC	On cost
ID	On delays
IE	on the environment

Probability Scale

Relative concentration of risk		Probability of occurrence
0.0	0.15	0.1
0.15	0.25	0.3

0.25	0.5	0.5
0.5	0.75	0.7
0.75	0.9	0.9

Estimation of Impact

	Impact : IP	Impact : IC	Impact : ID	Impact : IE
E1	7	7	3	1
E2	9	7	6	1
E3	7	6	6	1
E4	6	6	4	5
E5	7	5	2	9
E6	7	7	7	8

Les Matrices AHP

E1

	F1	F2	F3	F4	Weight
F1	1.0	5.0	3.0	0.5	0.28
F2	0.2	1.0	0.5	0.13	0.06
F3	0.33	2.0	1.0	0.14	0.1
F4	2.0	7.69	7.14	1.0	0.56

E2

	F1	F2	F3	F4	Weight
F1	1.0	3.0	0.25	0.5	0.14
F2	0.33	1.0	0.11	0.14	0.05
F3	4.0	9.09	1.0	2.0	0.52
F4	2.0	7.14	0.5	1.0	0.29

E3

	F1	F2	F3	F4	Weight
F1	1.0	4.0	0.33	2.0	0.22
F2	0.25	1.0	0.13	0.5	0.06
F3	3.03	7.69	1.0	7.0	0.62
F4	0.5	2.0	0.14	1.0	0.11

E4

	F1	F2	F3	F4	Weight
F1	1.0	2.0	4.0	7.0	0.51
F2	0.5	1.0	3.0	5.0	0.31
F3	0.25	0.33	1.0	2.0	0.12
F4	0.14	0.2	0.5	1.0	0.06

E5

	F1	F2	F3	F4	Weight
F1	1.0	6.0	8.0	2.0	0.54
F2	0.17	1.0	3.0	0.33	0.11
F3	0.13	0.33	1.0	0.17	0.05
F4	0.5	3.03	5.88	1.0	0.3

E6

	F1	F2	F3	F4	Weight
F1	1.0	0.33	3.0	4.0	0.25
F2	3.03	1.0	5.0	7.0	0.57
F3	0.33	0.2	1.0	2.0	0.11
F4	0.25	0.14	0.5	1.0	0.07

Calculation of the risk factor concentration for each undesirable event

Undesirable event	Linked risk factor category	Factors of category Xi	Weighting:Yi	Xi*Yi	Fraction of total Eq	Probability of Occurence	Max Impact	Level of Risk
E1	F1	7	4.0	28.0	--	--	--	--
	F4	7	3.0	21.0	--	--	--	--
			Sub-Total E1	49.0	0.23	0.3	7.0	2.1
E2	F1	7	4.0	28.0	--	--	--	--
	F3	3	2.0	6.0	--	--	--	--
	F4	7	3.0	21.0	--	--	--	--
			Sub-Total E2	55.0	0.26	0.5	9.0	4.5
E3	F3	3	2.0	6.0	--	--	--	--
			Sub-Total E3	6.0	0.03	0.1	7.0	0.7
E4	F4	7	3.0	21.0	--	--	--	--
			Sub-Total E4	21.0	0.1	0.1	6.0	0.6

Undesirable event	Linked risk factor category	Factors of category Xi	Weighting:Yi	Xi*Yi	Fraction of total Eq	Probability of Occurence	Max Impact	Level of Risk
E5	F4	7	3.0	21.0	--	--	--	--
	F1	7	4.0	28.0	--	--	--	--
			Sub-Total E5	49.0	0.23	0.3	9.0	2.7
E6	F1	7	4.0	28.0	--	--	--	--
	F2	2	1.0	2.0	--	--	--	--
			Sub-Total E6	30.0	0.14	0.1	8.0	0.8
			Total	210.0	100 %			

Result : Limit ACCEPT = 2.5

Accepted Risks	
Code	Description
E1	Work-related illness
E3	Drop in quality
E4	Inadequate design
E6	Explosion and fire

Risks à reduire	
Code	Description
E2	Drop in productivity
E5	Pollution