PRODUCTION DOWNTIME COST PER DAY (DC) = 150,00 EUR

1.	What are the functions and associated performance standards of the asset in its present operating context?																	
2.	In what ways does it fail to fulfil its functions?																	
3.	What causes each functional failure?																	
4.	What happens when each failure occurs?																	
5.	In what way does each failure matter?																	
6.	What can be done to predict or prevent each failure?																	
7.	What should be done if a suitable proactive task cannot be found?																	

	Question 1	Question 2	Question 3	Question 4	Question 5	Question 6	Question 7	Question 8	Question 9	Question 10	Question 11	Action	Action	Action	Action	Calculation result	Calculation result	
element	function	failure mode	cause of functional failure	consequence of functional failure	how it matters	preventive action	if no preventive action	causing downtime?	spare part available on the market (SSP)	spare part cost	on stock? (yes/no)	if Q9 is "NO" and Q11 is "NO", calculate VTDC "Vendor Total Downtime Costs"	if Q9 is "NO" and Q11 is "YES", calculate " VSPIV - Vendor Spare Parts Inventory Value"	if Q9 is "YES" and Q11 is "YES", calculate SSPIV "Standard Spare Parts Inventory Value"	delivery days if not put on stock (if Q11 is no)	VDDC (EUR) - vendor downtime costs due to delivery days	**VTDC** (EUR) - vendor total downtime costs	remark
B 31.1 Preheater	preheats inlet air when required	heater does not raise inlet air temperature when required	Valve V11.1 does not open due to the failure	steam can not flow through the heater, frosen downstream elements	damage on the downstream condenzator B32	supervising of inlet temperture (TIRC 208)	N/A	yes	yes	570,00 EUR	yes	-	-	SSPIV	N/A	N/A	N/A	low price, one spare part replaces more than one installed
			Steam trap V61.1 float blocked				N/A	yes	yes	270,00 EUR	no	-			N/A	N/A	N/A	does not fit to the max spare parts inventory value, steam drained
		raise inlet air temperature when not required	Valve V11.1 does not close due to the failure	to high inlet air temperature	cooling not performed as required	supervising of inlet temperture (TIRC 208)	N/A	no	yes	valve V11.1 is already put on stock	valve V11.1 is already put on stock	-	-	-	N/A	N/A	N/A	if V11.1 is unexpectable open it is possible to lower inlet air temperature with cooler B32
		Pheheater B31.1 leaks	frosen, usage time, vibration	wet floor and wet product	product quality	visual inspection or pressure test	N/A	yes	no	5.900,00 EUR	no	**VTDC**	-	-	10	1.500,00 EUR	**7.400,00 €**	
TIRC 208 Regulator	regulate preheating temperature	does not operate	bad preheating	wrong temperature	damage on the downstream condenzator B32	calibration	N/A	yes	yes	273,00 EUR	yes	-	-	SSPIV	N/A	N/A	N/A	low price, one spare part replaces more than one installed
B 21 Grit filter EU4	filtering inlet air	broken filter	frosen, wet,	no filtration of the inlet air	faster clogging of the next filter	measuring dP with PDI204	N/A	no	yes	50,00 EUR	yes	-	-	SSPIV	N/A	N/A	N/A	low price, frequently change
		clogged filter	dust quantity on the filter	lower air flow, higher energy consuption	more energy costs		N/A	no										
PDI 204	pressure difference indicator	does not measure	broken, damaged	wrong dP result	wrong decision about filter condition	calibration	N/A	no	yes	197,00 EUR	yes	-	-	SSPIV	N/A	N/A	N/A	low price, one spare part replaces more than one installed
B 22 Fine dust filter EU7	filtering inlet air	broken filter	frosen, wet,	no filtration of the inlet air	faster clogging of the next filter	measuring dP with PDI205	N/A	no	yes	55,00 EUR	no	-	-	-	N/A	N/A	N/A	does not fit to the max spare parts inventory value, failure very rear
		clogged filter	dust quantity on the filter	lower air flow, higher energy consuption	product can not be dryed as required, more energy costs		N/A	no										
PDI 205	pressure difference indicator	does not measure	broken, damaged	wrong dP result	wrong decision about filter condition	calibration	N/A	no	yes	the same as PDI 204	already put on stock	-	-	-	N/A	N/A	N/A	the same spare part as for PDI 204
PDAH 205 (switch)	providing alert for clogged filter B22	does not indicate clogged filter	broken, damaged	no alert	no information about clogged filter	calibration	N/A	no	yes	150,00 EUR	yes	-		SSPIV	N/A	N/A	N/A	low price, one spare part replaces more than one installed
B32 Condensator	cooling down inlet air	condensator does not lower inlet air temperature when required	Valve V11.2 does not open due to the failure	too high humidity of inlet air	humidity of inlet air effects product quality	supervising of inlet temperture (TIRC 209)	N/A	yes	yes	750,00 EUR	yes	-		SSPIV	N/A	N/A	N/A	low price and long delivery
			too low cooling water flow due to the blocked pipes				N/A	yes	N/A	N/A	N/A	-	-	-	N/A	N/A	N/A	preventive cleaning of the pipes required
		condensator lower inlet air temperature when not required	Valve V11.2 does not close due to the blockage	to low inlet air temperature	heating not performed as required	supervising of inlet temperture (TIRC 209)	N/A	no	yes	valve V11.2 is already put on stock	valve V11.2 is already put on stock	-	-	-	N/A	N/A	N/A	it is possible to rise inlet air temperature with main heater B31-2

		Condensator B32 leaks	broken, damaged	wet floor and wet inlet air	product quality	visual inspection or pressure test	N/A	yes	no	9.000,00 EUR	no	VTDC	-	-	10	1.500,00 EUR	10.500,00 EUR	
B36 Drop separator	separating water drops from inlet air	separator B36 leeks	broken, damaged	wet floor and wet inlet air	product quality	visual inspection	N/A	yes	no	1.000,00 EUR	yes	-	VSPIV	-	30	4.500,00 EUR	5.500,00 EUR	low price but long delivery
		drainage blocked	downstream drainage blocked	wet floor and wet inlet air	product quality	visual inspection	N/A	no	N/A	N/A	N/A	N/A	-	-		0,00 EUR	N/A	preventive cleaning of the pipes required, drain pipe can be by-passed
TIRC 209 Regulator	regulate inlet air cooling	does not operate	bad dehumidification	too high inlet air humidity	product quality	calibration	N/A	yes	yes	the same as TIRC 208	already put on stock	-	-	-		0,00 EUR	N/A	the same spare part as for TIRC 208
B 13 By-pass flap	directing inlet air though main heater or through by-pass	wrong direction of inlet air (through main heater)	pneumatic positioner failure	slow cooling of inlet air	product quality	supervising of inlet temperture (TIRC 202)	N/A	yes	no	4.000,00 EUR	no	VTDC	-	-	20	3.000,00 EUR	7.000,00 EUR	
		wrong direction of inlet air (through by-pass)		inlet air temperature too low	product quality													
B 31.2 Main heater	raise inlet air temperature when required	heater does not raise inlet air temperature when required	Valve V11.3 does not open due to the failure	steam can not flow through the heater	too low inlet air temperature	supervising of inlet air temperture (TIRC 202)	N/A	yes	yes	the same as V 11.1	already put on stock	-	-	-		0,00 EUR	N/A	the same spare part as for V 11.1
			Steam trap float blocked V.61.3			supervising of inlet temperture (TIRC 202)	N/A	yes	yes	the same as V 61.1	already put on stock	-	-	-		0,00 EUR	N/A	does not fit to the max spare parts inventory value, steam drained
		raise inlet air temperature when not required	Valve V11.3 does not close due to the blockage	to high inlet air temperature	cooling not performed as required effecting product quality	supervising of inlet temperture (TIRC 202)	N/A	yes	yes	valve V 11.3 is already put on stock	already put on stock	-	-	-		0,00 EUR	N/A	
		Main heater B31.2 leaks	frosen, usage time, vibration	wet floor and wet product wet HEPA filter	product quality	visual inspection or pressure test	N/A	yes	no	10.000,00 EUR	no	VTDC	-	-	10	1.500,00 EUR	11.500,00 EUR	
B 22 HEPA filter EU12	filtering inlet air	broken filter	frosen, wet,	no filtration of the inlet air	product quality	measuring dP with PDI212	N/A	yes	yes	250,00 EUR	no	N/A	-	-		0,00 EUR	N/A	high price short delivery, failure very rear
		clogged filter	dust quantity on the filter	too low air flow, higher energy consuption	product quality													
PDI 212	pressure difference indicator	does not measure	broken, damaged	wrong dP result	product quality	calibration	N/A	yes	yes	the same as PDI 204	already put on stock	-		-		0,00 EUR	N/A	the same spare part as for PDI 204
PDAH 212 (switch)	providing alert clogged filter B22	does not indicate clogged filter	broken, damaged	no alarm	product quality	calibration	N/A	yes	yes	the same as PDAH 205	already put on stock	-		-		0,00 EUR	N/A	the same spare part as for PDAH 204
TIRC 202 Regulator	regulate inlet air temperature	does not operate	bad inlet air temperature	too high or too low inlet air temperature	product quality	calibration	N/A	yes	yes	the same as TIRC 208	already put on stock	-		-		0,00 EUR	N/A	the same spare part as for TIRC 208

N/A not applicable

spare parts inventary value limited to **3000,00 EUR**

VSPIV (EUR) - Vendor Spare Parts Inventory Value =	1.000,00 EUR	value to be compared between vendors
SSPIV (EUR) - Standard Spare Parts Inventory Value	1.990,00 EUR	value defined by maintenance strategy
	2.990,00 EUR	total inventary value
VTDC (EUR) - Vendor Total Downtime Costs =	36.400,00 EUR	value to be compared between vendors