COLLABORATIVE JOB PLANNING - TUBE CLEANING

Plant Name: _____

Asset Name:

	Job Date:	Job Date:	
	Performed By:	Performed By:	Notes
JOB PARAMETERS			
Material being removed from tubes			
Material identified as	Scale	Scale	What is the material to be cleaned?
Material class	Hard/Brittle	Hard/Brittle	Identify the class of material to inform best cleaning methods.
Material hazard?	None - standard PPE	None - standard PPE	Speficy if there is hazardous material danger (GHS).
PPE requirements for material	2	2	Include historical data or MSDS to identify the level of PPE required to safely
Severity of fouling	25% plugged	25% plugged	How much material buildup is in the tubes on a SCALE of 0-5, where 0 = less
% plugged tubes	Visual	IRIS	How many of the total number of tubes in the exchanger are fully plugged wi
Inspection protocol			Understand the required level of cleaning per inspection protocol (visual, edd
Tube specifications			
Length	40 ft	40 ft	Overall length of tubes to be cleaned
Tube OD	7/8" (.875)	7/8" (.875)	
Wall thickness	16 Gauge tube (0.065")	16 Gauge tube (0.065")	
Tube ID	0.745"	.745"	Tubing is typically measured by OD. To clean the inside of the tubes, you ne
Number of tubes	2000	2000	
Tube pattern	Square	Square	Commonly square or triangular - will help determine automated options
Tube pitch	1.1"	1.1"	Typically, Tube Pitch = Tube OD x 1.25
Tube material & pressure limit	SS	SS	Consider maximum pressure specifications to avoid damage from water jets
Exchanger configuration			
Straight tube or u-tube	straight	straight	
Bends	NA	NA	If applicable, identify number and type of bends. Will limit rigid length of tool a
Tube face diameter	60"	60"	
Access to attach automated equipment	Bolt	Bolt	Identify whether exchanger has access to bolt on equipment or attach clamp
Channel head and/or bell head?	18" channel head	18" channel head	Will dictate guide tube requirements for automated options
Multi-pass/baffles?	No	No	Consider access limitations
Fin Fan?	No	No	Will dictate attachment requirements for automated options
Horizontal or Vertical orientation?	Vertical	Vertical	
Domed bundle or Open?	Open	Open	Specify also if open at end.
Jobsite considerations			
Job location	3rd level	3rd level	Describe location considerations, i.e. ground level, upper level, scaffold, conf
Distance of pump to water	100 ft	100 ft	Distance/access of pump to adequate water source determines how much h
Pressure of supply water	100 psi	100 psi	To determine size of supply hose
Connection & size of supply hose	3/4" Chicago	3/4" Chicago	
Water quality	Process	Process	Understand the water soource and ensure you have enough water to feed y
Distance of pump to job	150 ft	150 ft	Distance/access of pump to job determines how much hose you need from p
Drainage/effluent containment			
Vacuum truck	No	No	Will a vacuum truck be utilized? Consider access.
Physical barriers/barricades	3/4" ply shield	3/4" ply shield	Identify protections against nozzle(s) exiting open tubes
Containment/disposal	Blast bag	Blast bag	Specify containment and disposal requirements, i.e. blast bag, catch pans, v
EQUIPMENT & TOOLING REQUIREMENTS			
Determine optimal cleaning pressure			
Historical data	10000 psi	10000 psi	What pressure has been used to clean this job before?
Test/Theshold		4000 psi	Use cleaning tube sheet/gasket surfaces or other auxiliary equipment (i.e. va
Optimal pressure	10000 psi	12500 psi	Optimal pressure is typically 3-5 times the threshold pressure;
Pump			
Horsepower	325	325	
Pressure	10k psi	20k psi	
Flow	45 gpm	22 gpm	
Dump activation	foot pedal	pneumatic	Foot pedal, pneumatic dump valve, electrical switch?
Lances			
Quantity	5/2	6/4	
Size	50 ft	50 ft	
Length	1	3	
Connection	1/8" NPT male	3/8-24 RH	
Tooling			
Tool manufacturer/model	StoneAge BN13	StoneAge BN15	
Tool inlet	P2 (1/8 NPT)	MP6	
Flow	10 gpm	7 gpm	If using multiple tools/nozzles, identify flow per nozzle
Head type	Universal	Universal	Universal, polisher, unplugger?
Collet size	NA	ABX 121-512	For backout prevention, if applicable
Guide tube size & length	NA	ABX 117, 30.5"	
Discharge Hose(s)			
Document each length and size of hose below:			Specify size an length for each hose used.
Quantity	5	3	
Hose 1 Size	1/2" 10k	6/4	
Hose 1 Length	50 ft	50 ft	
Operating Pressure			Reference jetting.stoneagetools.com > Pressure Calculators
Pressure loss on lance	4572 psi	2203 psi	
Pressure loss on discharge hose	235 psi	206 psi	
Total pressure loss	4807 psi	2409 psi	
Pressure at nozzle(s)	5193 psi	17591 psi	
Automated Equipment			
AE selected	NA	ABX 3L with LWP	
Attachment options	NA	LWP with Bolted slotted clamps	
Access limitations	NA		
Additional considerations	NA		Consider available space for equipment setup
Results			Time of day, lighting, etc.
Setup time	30 min	1 hr	
Operating time	22 hr	7.5 hr	
Total time on job	22.5 hr	8.5 hr	
Water used	10560 g	9450 g	
Quality of cleaning	Passed visual inspection	Passed IRIS inspection	Passed inspection?
Opportunities			
Improve safety, quality of cleaning, save water/fuel, reduce # of operators, reduce operating time	Definitely improve safety, quality of cleaning, time on job; maybe save water disposal & fuel	For high percentage of plugs, consider using AutoStroke	
AUTHORIZATION			
Signed:			
	Plant authorization	*Plant authorization*	
Signed:			
	Contractor authorization	*Contractor authorization*	