



Creative Brewery Maintenance

BA Collab Hour - May 12th 2022

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BREWING FOR
THE GOOD OF
OUR COMMUNITY,
EMPLOYEES, AND
ENVIRONMENT.



Maine Beer Company



Do what's right.



Hello!

We are Seán Diffley & Jon Gagne.

Seán is the Director of Engineering at Allagash Brewing Company.

Jon is the Engineering Manager at Maine Beer Company.



Maine Beer Company



Do what's right.



Maintenance

Brewery maintenance, is the process of implementing processes to reduce breakdowns, increase uptime, and promote overall reliability.

Some *Definitions*



Reactive Maintenance

Is concerned with tasks that come after a piece of equipment breaks down. The advantage of reactive maintenance is that the initial costs are significantly lower.



Preventive Maintenance

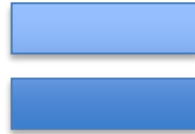
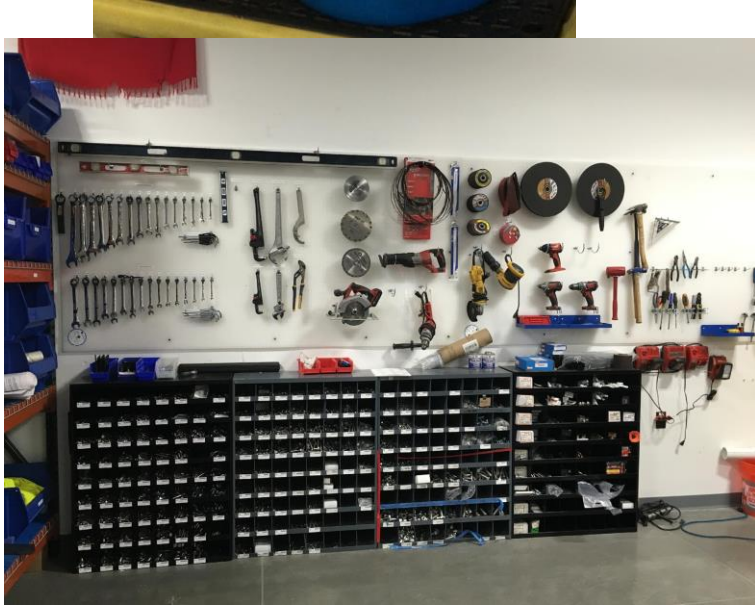
A preventive maintenance (PM) strategy requires doing tasks proactively according to a usage- or calendar-based schedule.



Predictive Maintenance

A method of preventing the failure of expensive manufacturing equipment, by analyzing data throughout production to pinpoint unusual behavior ahead of time.

Why is Maintenance **Critical**?



Why is Maintenance Critical?



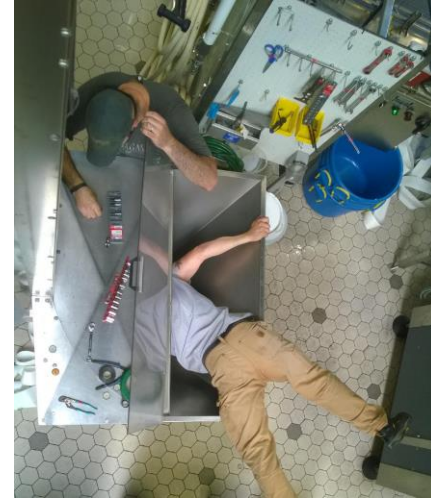
Safety

Employee and equipment safety is the foundation of any maintenance program.



Quality

Brewery Operations can not achieve their QC standards if their tools, systems or equipment are not at 100%.



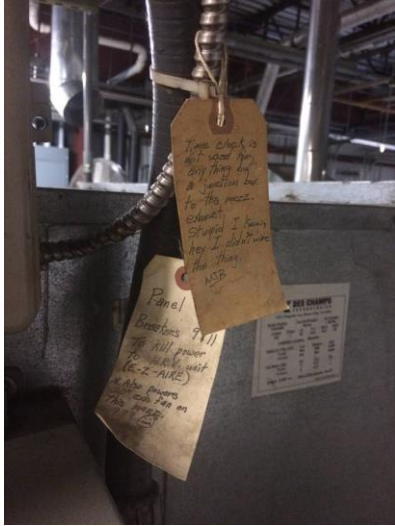
Reliability

When brewery equipment runs at its expected capacity, brewery operations are likewise sustained



***Creative Maintenance
Strategies***

Maintenance Creative Strategies



Communication

Clear and simple communication plans reduce lost time, money and productivity.



Organization

Clean and uncluttered storage workspace saves time and money



Standardise

Minimizing as far as possible the number of different brands and models of product used for the same task

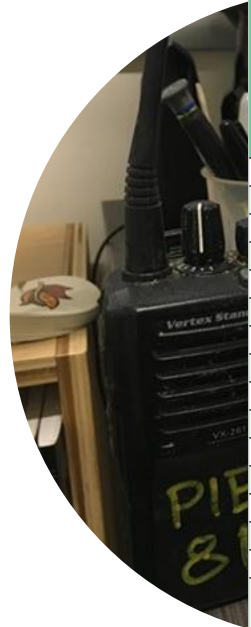
Communication

Keep it simple - leverage technology

- Finding People
- Routine Checks
- Communication of Work



Communication - Finding People





ENGINEERING PHONE LIST and SCHEDULES

Name	Area	Phone Number	Schedule
Ben Baldus	Controls & Automation		Mon-Fri 8:00 - 16:30
Dan Sanford	Controls & Automation		Mon-Fri 7:00 - 15:30
Salim Raal	Controls/ Mechanical		Tu-Fri 13:00 - 21:30
Wade Hersey	Electrical		Mon-Thurs 13:00 - 23:30
Asa Korsen	Facilities		Mon-Thurs 13:00 -23:30
Oly	Facilities		Tu-Sat 6:30 - 15:00
Bob Kutch	Facilities		Mon-Fri 9:00 - 17:30
Luke Truman	Facilities		Mon-Fri 8:00 - 16:30
Charley Davis	Mechanical		Mon-Thurs 13:00 - 23:30
Sam Livingstone	Mechanical		Mon-Thurs 5:00 - 15:30
Dan Gagnon	Mechanical		Mon-Thurs 5:00 - 15:30
Liz Mycock	Admin/ Mechanical		Mon-Fri 8:00 - 16:30
Tyler Weidner	Mechanical		Tu-Fri 6:00 - 16:30
Eric Meader	Parts and Inventory		Mon-Fri 7:30 - 16:00
Travis Emery	IT		Mon, Wed 5:00 - 13:30, Tu,Thurs, Fri 5:00 - 10:00, 13:30 - 16:30 WFH
Seán Diffley	Engineering	Mon-Fri 7:30 - 16:00	

Communication - Routine Checks

Daily Rounds -

Bare minimum for any maintenance program

Boiler Rounds					
	Monday	Tuesday	Wednesday	Thursday	Friday
AM	Sam	Sam	Sam	Sam	Eric
MID	Chuck	Tyler	Eric	Tyler	Sean
PM	Luke	Chuck	Luke	Chuck	

Auxiliary Rounds					
	Monday	Tuesday	Wednesday	Thursday	Friday
AM	Sam	Sam	Sam	Sam	Eric
PM	Chuck	Chuck	Chuck	Chuck	Pickles

Year:	2016	Measurement/ Set Point	DATE-AM	PM	DATE-AM	PM	DATE-AM	PM	DATE-AM	PM		
Year:	2016		4/18	6:45	4/19	05:30	7:15	7:30	7:30	4/21	8 AM	6:30
Time:			6:00	Y	05:30	Y	7:15	Y	7:30	Y	8 AM	6:30
50 Glycol Pumps Running:	(Y/N)		YES	Y	YES	Y	YES	Y	YES	Y	Y	Y
50 Glycol Level:	(%)		75%	75	83%	75	83%	75	83%	75	75	75
50 Glycol Loop:	(30°-35°)		35°	OK	34°	OK	34°	OK	34°	OK	34°	OK
50 Glycol In:	(30°-35°)		34°	OK	36°	OK	37°	OK	36°	OK	34°	OK
50 Glycol Out:	(*)		87°	OK	87°	OK	91°	OK	87°	OK	111	113
50 Air Compressor 1 Temp:	(*)		87°	OK	87°	OK	112	OK	110	OK	141	149
50 Air Compressor 1 Pressure:	(psi)		111	141	111	189	114	160	123	114	14	14
50 Air Compressor 2 Temp:	(*)		192°	189	190°	115	114	192°	123	7025	7081	7081
50 Air Compressor 2 Pressure:	(psi)		115	123	6878	6916	6920	54	52	51	51	51
City Water Usage (4 digits):	(X100)		0802	8335	23K	30 K	12.5	15	15	20.2	20.2	20.2
50 CO2 Bulk:	(X1000)		27K	25.5	79%	15.3	Y	Y	Y	Y	Y	Y
Spent Yeast:	(%)		0%	3.5	No	Y	OK	OK	36% OK	OK	OK	OK
Pump Running:	(Y/N)		No	No	No	Y	OK	OK	52%	OK	OK	OK
50 Hop Cooler:	(34°+5) OK?		34°	OK	51°	OK	OK	OK	Y	Y	Y	Y
CLX Room:	(50°+5) OK?		52°	OK	64%	OK	Y	Y	Y	Y	Y	Y
CLX Room Humidity:	(50%) OK?		OK	66%	YES	NO	Y	Y	Y	Y	Y	Y
D.I.O. Recirc Pump Running?	(Y/N)		YES	NO	YES	NO	Y	Y	Y	Y	Y	Y
CO2 Bunker East:	(ppm)		2160	1050	1940	870	650	600	2530	1610	1700	1700
CO2 Bunker West:	(ppm)		1840	470	1750	710	600	600	1530	1700	1700	1700
CO2 Fudge:	(ppm)		1840	870	1550	Y	Y	Y	YES	OK	OK	OK
CO2 CTs:	(ppm)		YES	Y	YES	OK	OK	OK	63%	61	61	61
Exterior CT Pump Running?	(Y/N)		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Exterior CT Glycol Temp:	(31° +/- 3) OK?		134°	61	63°	97	97	90	90	90	90	90
100 Compressor Temp:	(*)		61°	61	103	97	97	90	90	90	90	90
100 Compressor Pressure:	(psi)		100	100	100	96%	96%	OK	OK	OK	OK	OK
100 Bulk CO2:	(%) Order @ 30%		35%	100	100	67%	67%	OK	OK	OK	OK	OK
100 Cellar Temp:	(%) Order @ 30%		62°	OK	OK	0430	330	2700	61° OK	280	280	280
100 Ambient CO2:	(ppm)		0360	380	0430	Y	Y	Y	Y	Y	Y	Y
100 Glycol Pumps Running:	(Y/N)		YES	Y	YES	Y	Y	Y	Y	Y	Y	Y
100 Glycol Temp:	(*)		28°	35°	30°	34	34	34	34	34	34	34
100 Glycol Level:	(%)		80%	75	70%	72%	72%	75%	75%	75%	75%	75%
Wild Bbl Room - CO2:	(ppm)		0620	430	0510	460	460	310	0570	460	460	460
Wild Bbl Room - Temp:	(62°/+5) OK?		OK	OK	OK	OK	OK	OK	62° OK	OK	OK	OK
Wild Bbl Room - Humidity:	(50%) OK?		OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
81 Inspection:	OK?		OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
TECHNICIAN:			EAM	LSD	EAM	LSD			LSP	EAM	LSD	
FRIDAY FUDGE HOURS:												
COMMENTS:												
4.3in/WC = 1% 320 in/WC = 75% FULL												

54 Pump
is ready
LOAD

Communication - *It's Simple*

Easy knowledge/status sharing ideas

- Paper checksheets & logs
- Peg boards for checksheets
- Parts tagging - new vs. repaired vs. broken

Date	Action / Description / Location	MRP Task / Location	Quality / MRP	Color / Mark	Status / Note	Comments
7/21/21			OK		BT	Replenish tank & check #1 (SPP) - 2 tanks swapped & used
8/5/21			✓		BT	Boilers - Tank
8/15/21					BT	Hoplings - Smiling Cat Milk - always check 1 cup per 100L
8/20/21			✓		BT	Don't forget
8/24/21					BT	Don't forget 100L per day - 100L per day
8/24/21			✓		BT	Don't forget 100L per day - 100L per day
8/27/21					BT	Don't forget 100L per day - 100L per day
9/1/21			✓		BT	Don't forget
9/14/21					BT	Don't forget 100L per day - 100L per day
9/15/21			✓		BT	Don't forget 100L per day - 100L per day
9/16/21					BT	Don't forget 100L per day - 100L per day
9/16/21					BT	Don't forget 100L per day - 100L per day
9/21/21			✓		BT	Don't forget 100L per day - 100L per day
9/22/21					BT	Don't forget 100L per day - 100L per day
9/27/21			✓		BT	Don't forget 100L per day - 100L per day
9/30/21					BT	Don't forget 100L per day - 100L per day
10/1/21					BT	Don't forget 100L per day - 100L per day
10/11/21					BT	Don't forget 100L per day - 100L per day
10/11/21			✓		BT	Don't forget 100L per day - 100L per day
10/12/21					BT	Don't forget 100L per day - 100L per day
10/13/21					BT	Don't forget 100L per day - 100L per day
10/14/21			✓		BT	Don't forget 100L per day - 100L per day

* 9/11/21 - SoWhite HX installed and back to boiler @ 15:40
 * 9/11/21 - Boiler Water Samples taken



Communication - Routine Checks

Tank Maintenance

3 Month Tank Maintenance			
Yeast Brink	Date	Conditioning Tank	Date
YB1		CT1	
YB2		CT2	10/15/15
YB3		CT3	
YB4		CT4	
YB5		CT5	
		CT6	
		CT7	
		CT8	10/16/15
		CT9	10/16/15
		CT10	10/16/15
		CT11	10/16/15
		CT12	
		CT13	
		CT14	
		CT15	

Brinker	Date	User	Notes	PRV Relief Pressure	Tank Top Cleaned	Tri-Clamp Replaced	Spunding Valve
B02			No Record	No Record			
B04	Mar 15, 2022, 3:59:07 PM	mwest	Tank maintenance complete				
B05	Sep 27, 2021, 3:04:01 PM	dgagnon	complete				
B07	Mar 15, 2022, 3:59:55 PM	mwest	Tank maintenance complete				
B08	Dec 14, 2021, 1:49:51 PM	dgagnon	done				
B09	Mar 16, 2022, 3:59:42 PM	mwest	Tank maintenance complete				
B11	Mar 16, 2022, 4:00:24 PM	mwest	Tank maintenance complete				
B13	Dec 16, 2021, 4:37:41 PM	sgaal	Tank maintenance complete				
B14			No Record	No Record			
B17	Jun 18, 2021, 1:42:35 PM	sraal	Complete				
B19			No Record	No Record			

Old Cellars	Date	User	Notes	PRV Relief Pressure	Tank Top Cleaned	Tri-Clamp Replaced	Spunding Valve
CV01	Jul 8, 2021, 4:16:43 PM	cdavis	complete				
CV02	Nov 22, 2021, 8:41:26 PM	cdavis	complete				
CV03	Nov 12, 2021, 5:09:24 PM	sraal	Post Nuke Maint complete				
CV07	Jul 28, 2021, 10:48:50 PM	sraal	Post Nuke rebuild complete				
CV08	Sep 1, 2021, 9:46:01 PM	sraal	Post Nuke rebuild complete				
CV09	Mar 16, 2022, 10:27:17 PM	sraal	Complete				
CV10	Feb 21, 2022, 9:24:35 PM	cdavis	complete				
CV11	May 25, 2021, 10:17:12 PM	sraal	Complete. Sprayball was dirty. Clean				
CV14	Jul 15, 2021, 4:48:44 PM	cdavis	complete				
CV15	Nov 5, 2021, 5:56:59 PM	sraal	Complete				
CV16	Feb 21, 2022, 9:25:41 PM	cdavis	complete				
CV17	Nov 18, 2021, 9:41:09 PM	sraal	Complete				
CV18	Dec 9, 2021, 8:12:59 PM	sraal	Post Nuke maint. complete. Swapped				
CV19	Nov 23, 2021, 8:40:12 PM	cdavis	complete				
CV20	Jul 7, 2021, 4:48:35 PM	cdavis	complete				
CV21	Jul 8, 2021, 1:20:44 PM	cdavis	complete				
CV22	May 25, 2021, 10:17:44 PM	sraal	Complete. Sprayball was dirty. Clean				
CV23	Jul 15, 2021, 5:23:24 PM	cdavis	complete. dirty sprayball				
CV24	Mar 17, 2022, 12:27:30 PM	dgagnon	complete				
CV28	Apr 19, 2022, 5:38:07 PM	mwest	Tank maintenance complete early do				
YB03	Mar 17, 2022, 10:30:12 PM	mwest	Tank maintenance complete. Lip seal				
YB07		No Record	No Record				

Brinker	Date	User	Notes	PRV Relief Pressure	Tank Top Cleaned	Tri-Clamp Replaced	Spunding Valve
WT01	Mar 31, 2022, 8:45:11 PM	cdavis	replaced rupture disc				
WT02	Aug 18, 2021, 10:55:23 PM	cdavis	complete				
WT04	May 19, 2021, 5:18:29 PM	cdavis	complete, rupture disc checked				
WT05		No Record	No Record				
WT06		No Record	No Record				
WT07	Apr 8, 2022, 8:08:10 PM	cdavis	complete, rupture disc checked				
WT08	Aug 17, 2022, 10:27:27 PM	cdavis	complete				
WT09	Mar 31, 2022, 4:46:53 PM	cdavis	complete				
WT10		No Record	No Record				
CT01	May 19, 2021, 8:34:29 PM	cdavis	complete				

Tank Maintenance: B06

TANK MAINTENANCE REQUIRED NOW

Tank Maintenance Record

PRV Relief Pressure: 0 psi

Tank Top Cleaned

Tri-Clamp Replaced

Spunding Valve

Side Port Gaskets

Side Port Valve Rebuild

Submit Maintenance B06

Tank	Date	User	Notes	PRV Relief Pressure	Tank Top Cleaned	Tri-Clamp Replaced	Spunding Valve
B06	4/7/2021	sraal	Complete	14.9	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B06	4/16/2020	Tweidner	Complete	14.1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Something > Nothing

Start Somewhere

- Tagging, Labeling, Tracking



Lübé Update checklists

	Last	Due
MLT Bottom <i>After CIP</i>	5/8	5/13
MLT Spindle <i>Check 1x/wk → grease 1x/mo</i>	4/8	5/8
MLT Internal <i>1x/mo</i>	4/8	5/8
Jet Star <i>Check 1x/wk → grease 1x/mo</i>	4/08	5/08
Mill - Lithium ONLY		
Mill - Top Auger <i>6mo</i>	<i>last only 3/1/22</i>	4-1-22
Bottom Auger <i>1yr</i>	3/26/21	3/26/22
Clean Magnet <i>1mo</i>	4/8/22	5/8/22
OUT DOOR DRAG CHAIN BEARINGS (E9)	Quarterly	11-11-21 2-11-21
PRESURIZED RAMP HOSE - 6/15/21 BOILER WATER SAMPLES (0/1/21) 10/19/21 2/4, 2/5, 2/25, 4/7, 5/17, CBO, 9/6		
BT SIGT TUBES (2/16mo) BT 1 BT 2 BT 3		
RICE Internal: 10/13/21 RICE Bags: 4/28/22 Silo DUCTS: 10/10/21 Mill Internal: 10/1/21 Grist Bin Convs: 12/8/19 Pipe Chain Conv: 12/11/19 Mill Dust Collectors: ISBBL Starter: 10/1/21 (a) 4/11/20		
Holding Tanks Purged L: 4/1/22 N: 7/1/22 H: 3/20/21, 6/1/21, 10/2/21		
HLT CIP L: 4/1/22 N: 7/1/22 H:		

Start Small - Write It Down



Build Equipment History

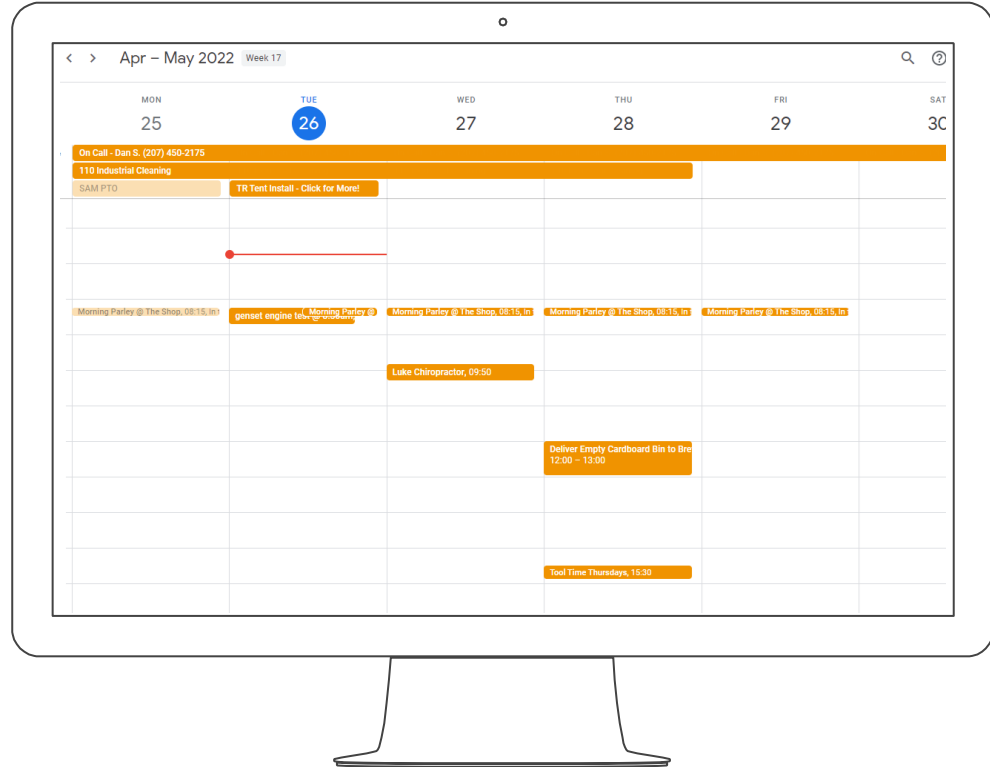
- Make it easy to write it down ASAP - don't forget
- Make it easy for everyone to see - communication

	A	B	C	D	E	F
1	KHS MicroFiller					
2	Date	Subsection	Operation Issues	Action Taken	Notes	OPR
80	3/1/22	Fill Valves 27&1		Swapped valves	valve 1 is now short-filling, so we know there is something going on in the valve itself, not the penumatic bank	DL/JL/JG
81	3/2/22	Fill valve 1	short fills	removed upper part of fill valve and replaced with fully rebuilt spare	Still leaking as of 3/3/22. Will rebuild and replace the "cage" part of the valve body first and foremost	DL
82	3/9/22	Fill valve 1	short fills	removed entire valve block and replaced with the OG 27 valve block as well and replaced deflection sleeve on vent tube	Appears to have solved the issue. Valve #1 is filling fine now, issue must have been in the valve body. Valve body S1 now needs to be cleaned and rebuilt	DL/MD
83	3/9/22	Bottle presence and bottle b	When the flag for valve 1 was reinstalled, the flag itself was a little too far out and crashed into the prox switches, destroying both	replaced torck switches with two on-hand spares that were originally used for the BH MLT.	OG switches had a range of 10mm, new switches had a range of 3mm. We had to align each of the lift cylinders with each prox switch and ensure that the flag would be read. 6 valves were unable to be read, and metallic bandaids allowed us to protrude the valve flag by one mm at a time. these need ot be removed when the correct sensors arrive	DL/JG/MD
84	4/5/22	Sight Glass Light	Unable to use, when it's turned on we get a filler error	Removed light	Currently sitting on shelf in MCC room	DL
85	4/15/22	Filler Carousel	Tons of broken bottles		it looks like the bottles are hitting the centering bell when they come off of the star wheel and onto the lifting elements. The mouth of the bottle is also dragging on the bell when it comes off the filler and onto the crowner star wheel. I think that without a height adjustment motor in place, there is no brake to stop it from falling further down	DL

Communication - What and When?

Maintenance calendar

Create an open and dedicated calendar for maintenance events, project info, staff availability and equipment downtime.



Start Small - Write It Down



Plan and Schedule

- “PM Calendar” - know when tasks are due ahead of time
- Simple sorting and filtering allows for prioritization

	A	B	C	D	E	F	G	H	I
1	BREWING, CELLAR, PIT, SAFETY, OTHER PM's			Last Updated	3/2/22 JG				
2	Last Done	Next Due	Area/Dep	Machine	Part/Acti	Frequency	Description	History	sv
42	12/1/17	1/1/18	Pumps	PP4 Peristaltic	Roller Inspection	Annually			
43			Pumps	PP5 Cellar Blow	Vane Inspection	6 Months			
44	12/1/17	12/1/18	Pumps	PP6 Centrifuge	Mech Seal	Annually			
45	12/1/17	12/1/18	Pumps	PP101 MicroFill	Mech Seal	Annually			
46	2/27/18	2/27/19	Pumps	PP101 MicroFill	Casing Gasket	Annually			
47	9/17/21	3/27/22	Packaging	Combi keg	Steam Filter	6 Months	Change out filter and send removed filter out for ultrasonic cleaning. Filter #1 & Filter #2 - keep track of how many times each has been cleaned		
48	11/15/21	5/15/23	Packaging	MicroFiller	Jetter Pump	18 Months	Change out Jetter Pump and send removed pump out for rebuild. Pump #1 & #2 - keep track of how many times each one has been rebuilt	10/22/20,10/27/21,11/	
49	10/14/21	4/14/22	Grain Handling	KICE	Filter Bags	Annually	Change out Filter Bags with new ones		
50	7/16/18	7/16/19	Grain Handling	KICE	Air Dryer Desicc	Annually	Pull Desiccant out and restore it in the oven - see procedure in Wilkerson manual		
51	10/14/20	4/14/21	Grain Handling	KICE	Intake Pipe Wor	6 Months	Open up and inspect intake pipe work from Silos in the spring and fall	10/14/20,4/14/21,10/1	
52	1/25/21	1/25/22	Brewhouse	Calandria	Inspection	Annually	Get in kettle and inspect condition of clandria and cleanliness of tubes	2/15/19,1/25/21,	
53	12/10/21	12/9/22	Utilities	Boiler	Internal Inspect	Annually	State Required Internal Inspection, Boiler must be shut down, cool and opened up	12/17/18,12/12/19,12/	
54	6/11/21	6/1/22	Utilities	Boiler	External Inspect	Annually	State Required External Inspection, must test low water cut off, boiler needs to be running	6/21/19,8/11/20,6/11/	
55	1/26/21	8/26/21	Utilities	Boiler	Boilermate Che	7 Months	Usually need new drum of Boilermate Anti-Scale chemical every 7 mo.	5/12/20,	
56			Utilities	Boiler	Colormetry Cart	5 Months	Usually need new Colormetry cartridge every 5 mo.		
57			Utilities	Boiler	Boiler Air Filter	6 Weeks	Usually need new air filters every 6 weeks		
58			Utilities	Boiler	Feedwater Tanl	Annually	Pull, inspect, and clean		
59	3/30/21	3/1/22	Utilities	Backflow Preve	BFPV-1 Fire Sys	Annually	High Tech Fire Protection		
60	3/12/21	3/1/22	Utilities	Backflow Preve	BFPV-2 Product	Annually	Nason		
61	3/12/21	3/1/22	Utilities	Backflow Preve	BFPV-3 Office	Annually	Nason		
62	3/12/21	3/1/22	Utilities	Backflow Preve	BPFV-4 Tasting	Annually	Nason		
63	3/12/21	3/1/22	Utilities	Backflow Preve	BPFV-5 Irrigatic	Annually	Nason		

Organisation

Keep it simple - leverage technology

- Organise your parts
- Organise your space
- Organise your work



Organise your *Inventory*



Organise your *Inventory*



Organise your *Space*



Organise your Work



seconds ago

& A

F

Serial/Size

- DN50
- DN50
- DN50
- DN100
- DN80
- DN100
- DN50
- DN50
- DN25
- DN65
- DN50
- DN50



Start Small - Tag & Track

Build Equipment History

- Tag/Label individual components that require maintenance
- Know when and how often something needs maintenance
 - i.e. - Manual valves, sight glasses, stationary and loose cellar parts



	A	B	C	D	E	F
1	Valves	Valve #	Location	Year	Size	Comments
96	<u>Tru-Flo</u>	T1	Spare		2018 2"	
97		T2	Spare		2018 2"	
98		T3	Spare		2018 2"	Replaced disc and screw 5/20/21
99		T4	Spare		2018 1 1/2"	
100		T5	Spare		2018 1 1/2"	
101		T6	Spare		2018 1 1/2"	Replaced handle and screw 1/25/22. Back in cellar
102		T7	Spare		2018 1 1/2"	
103		T8	Spare		2018 1 1/2"	
104		T9	Combikeg Pump		2018 2"	
105		T10	Maintenance		2018 2"	Out of Service, hex screw broke off in disc
106		T11	Cellar Pump		2018 2"	Out of Service, hex screw broke off in disc
107		T12	Cellar Water Drop(FV1)		2018 1 1/2"	
108		T13	Cellar Hose (FV1)		2018 1 1/2"	
109		T14	Spare		2018 2"	
110		T15	Centrifuge Pump		2018 2"	Placed on Centrifuge Pump, previously on shelf
111		T16	Spare		2018 1 1/2"	
112		T17	Dosing Pump Outlet		2018 1 1/2"	
113		T18	Spare		2018 1 1/2"	
114		T19	Spare		2018 1 1/2"	
115		T20	Spare		2018 1 1/2"	

Start Small - Tag & Track

Build Equipment History

- Another example - hose inspections
- Simple things can prevent major problems



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	MBC BREWERS HOSE INVENTORY & INSPECTION DATA												
2													
3													
4	Mark	Hose	Hose Brand	Length	Diameter	Month	Year	Color	In Service?	Comments	Usability	Last Condition 1, 2, 3, 4	Inspection Notes 2021 Q4
21		17	Vintner Reserve EPDM	18	1 1/2"	June	2021	Grey w/ Yellow	Y	OMNI		1	
22	Mark	19	Vintner Reserve EPDM	25	2"	June	2021	Grey w/ Yellow	Y	OMNI		1	
23	Mark	20	Vintner Reserve EPDM	20	2"	June	2021	Grey w/ Yellow	Y	OMNI		1	
24	Mark	21	Vintner Reserve EPDM	20	2"	June	2021	Grey w/ Yellow	Y	OMNI		1	
25	Mark	22	Vintner Reserve EPDM	20	2"	June	2021	Grey w/ Yellow	Y	OMNI		1	
26	Mark	28	Continental Vintner	10	1 1/2"	September	2019	grey w/ purple	Y				
27		29	Vintner Reserve EPDM	18	1 1/2"	June	2021	Grey w/ Yellow	Y	OMNI		1	
28	Mark	30	Continental Vintner	25	1 1/2"	September	2019	grey w/ purple	Y				
29	mark	31	Continental Vintner	25	1 1/2"	September	2019	grey w/ purple	Y				
30		32	Purple Snake	4.5	1 1/2"	September	2019	red	Y	for bottling pump outlet			
31		33	Continental Vintner	10	1 1/2"	June	2020	grey w/ purple	CIP	From PRC		4	Marked CIP only march 2021. Puckered ends, mir
32	Mark	CV1	Continental Vintner	18	1 1/2"		2015	grey w/red	Y				
33	Mark	CV3	Continental Vintner	15.5	1 1/2"		2015	grey w/ purple	Y				
34		N1	Novabrew	25	1 1/2"	April	2018	burgundy	Y	For yeast process only		4	EndoN: 0:08 Black spots, 0:18 Gross blemish, 0:5
35		N2	Novabrew	25	1 1/2"	April	2018	burgundy	Y	For yeast process only		4	Minor puckering on one side. IDK what theother i
36		N3	Novabrew	15	1 1/2"	April	2018	burgundy	Y	For yeast process only		4	N3Bore: 0:33 black spotting, 0:39 blemishes, loo
37		N5	Novabrew	5	1"	November	2018	burgundy	Y	For yeast process only		4	puckering, black spotting and blemishes through
38		P1	Purple Snake	10	1 1/2"	June	2020	red	Y				
39		P2	Purple Snake	20	1 1/2"	June	2020	red	Y				

Standardise

Keep it simple - run lean

- Inventory consolidation
- Tool standardisation opportunities
- Standardise prints and drawings



Standardise - Rebuild Kits

Keep it simple - run lean

- Parts List with Quantities
- Tool list
- Mechanical drawings and or Instructions

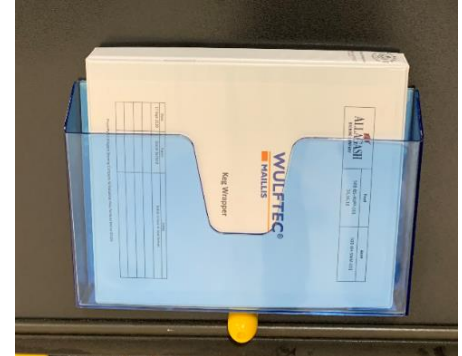
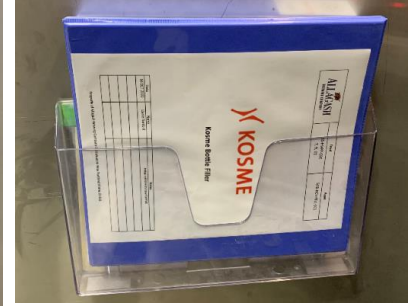


Standardise - Schematics

Before:



After:



Thanks!

Any questions?

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