TEXAS STATE UNIVERSITY ®

The rising STAR of Texas

2.4 Signify TPM

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signify

Problem Statement

- Signify wants to implement Total Productive maintenance on their Powder Coat Paint Line.
- Implementing TPM will minimize unscheduled downtime and improve efficiency of the Powder Coat Paint Line.
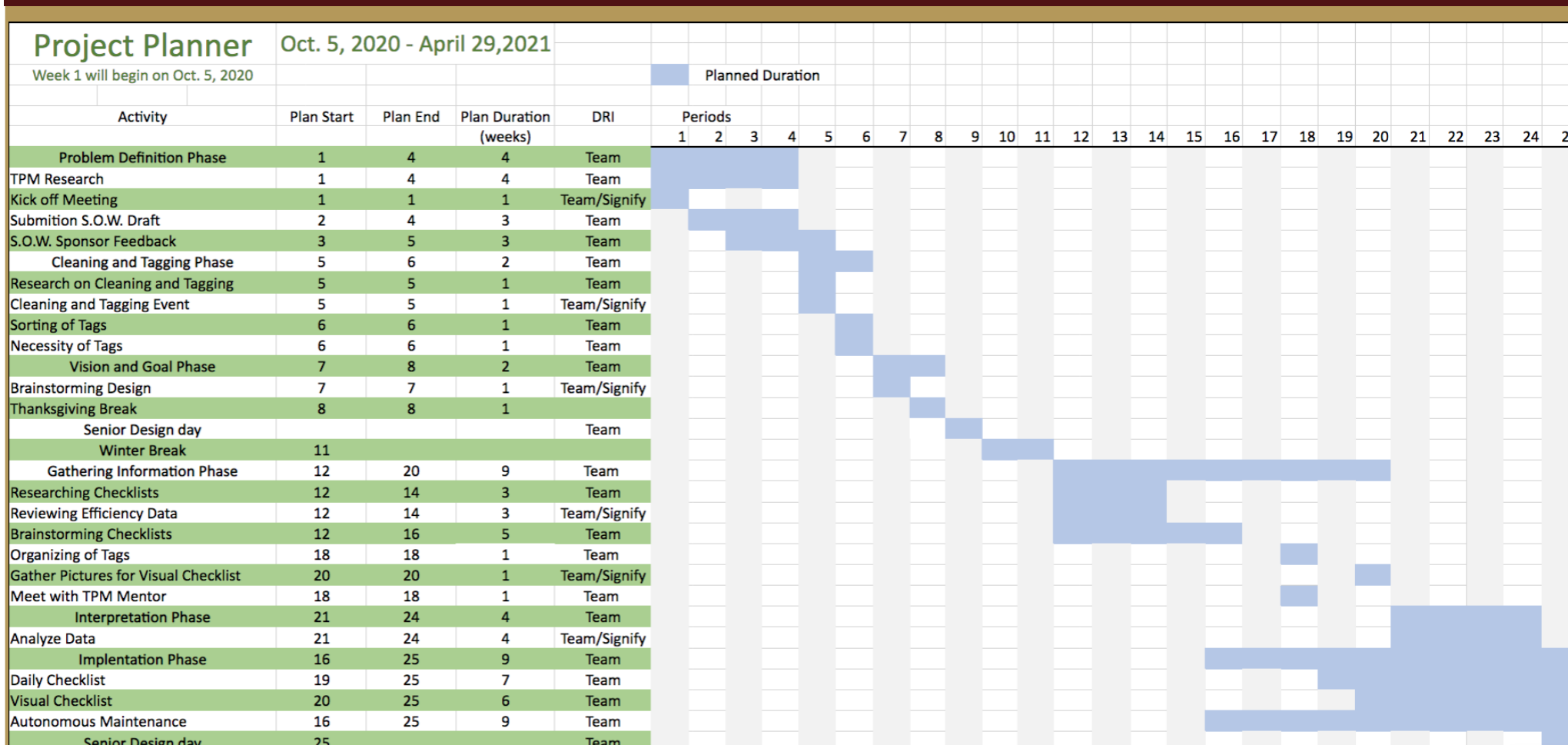
Purpose

- The goal of the TPM program is to reduce machine breakdowns by restoring the equipment to like new and engaging operators in basic maintenance.

Objectives

- Participate in cleaning/tagging event
- Developed an Autonomous Maintenance Checklist and a Visual Checklist.
- Meet with TPM Mentor.
- Analyze OEE Data to better help checklists.
- Present Project at Senior Design Day.

Schedule

7- Step Autonomous Maintenance Methodology

The project team decided to use the 7-step method for implemented Autonomous Maintenance in TPM.

1. Initial cleaning was done to find problem areas on the paint line. Tags were then created to note areas of concern.
2. This step helps to find sources of contaminants and seeks to rectify them.
3. Setting cleaning standards helps operators to know how and when machine cleaning is needed.
4. Provides insight on what remaining implementations are necessary
5. This step uses the paint line workers' feedback to develop an autonomous maintenance checklist.
6. This step is the design and implementation of an autonomous maintenance checklist.
7. The goal of full Autonomous Maintenance is to minimize unscheduled downtime thus improving overall equipment effectiveness (OEE).
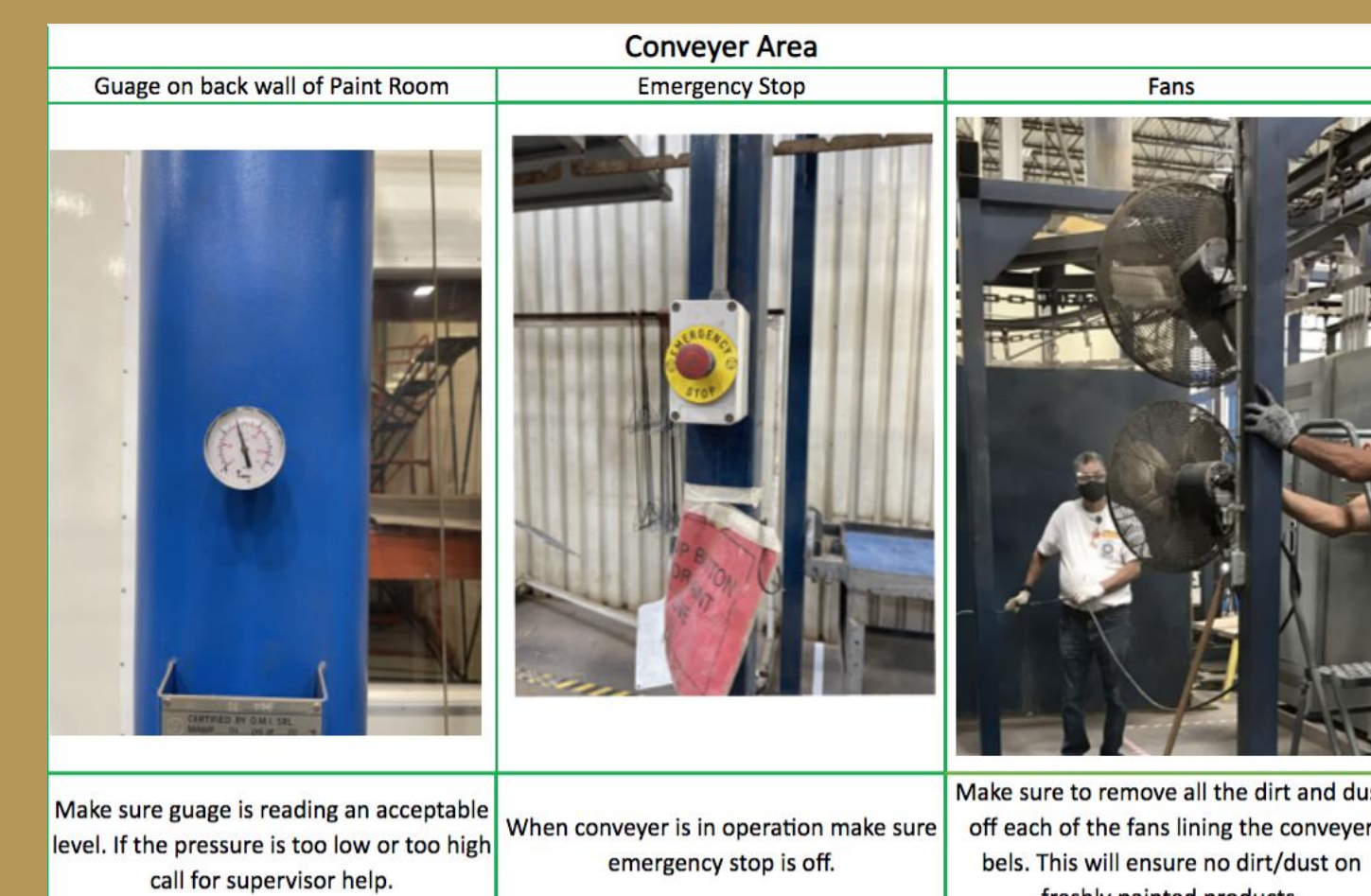
TPM Autonomous Maintenance Checklists

The team provided Signify with two separate checklists to promote autonomous maintenance.

Checklist 1: TPM AM Checklist

- The TPM AM Checklist is a quick and efficient way for paint line operators to perform the necessary checks throughout the paint line as frequently as necessary.
- An "X" within the grey box denotes completion of the check that has been performed.

Checklist 2: TPM Visual Checklist

Make sure guage is reading an acceptable level. If the pressure is too low or too high call for supervisor help.

When conveyer is in operation make sure emergency stop is off.

Make sure to remove all the dirt and dust off each of the fans lining the conveyer bels. This will ensure no dirt/dust on freshly painted products.

- The visual variant of the checklist includes the same tasks as the basic TPM AM checklist as well as images depicting the exact spot on the paint line which the step is referring to.
- This variation helps operators to perform their checks as quickly as possible as the images aim to lead them directly to the area in reference.

Evaluation Criteria

Overall Equipment Effectiveness (OEE)

- Upon the implementation of TPM, Signify has seen an increase in OEE of 8.14%.

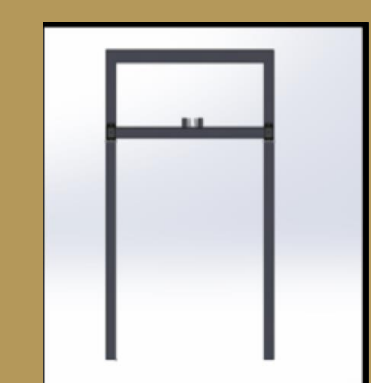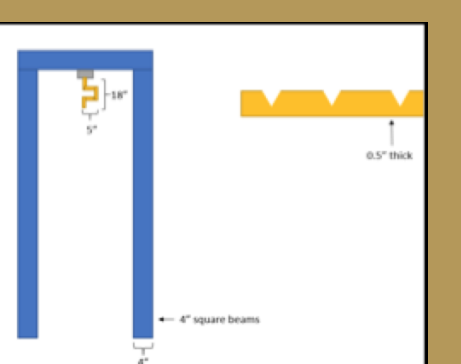| Start Date	End Date	Mean OEE
8/31/2020	10/7/2020	88.85%
3/26/2021	4/27/2021	96.99%
	Improvement	8.14%

Though a vast improvement between these time periods can be noted, these improvements are most likely not solely attributed to the implementation of TPM.

Paint Line Conveyor Brush Savings

- By implementing the paint line conveyor brush, Signify can expect a savings of $768 annually.

Paint Conveyer Brush

We have designed a brush attachment for Signify's Conveyer. This brush will clean the conveyer without any needed operator, saving Signify $768 annually.

Team Members

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- Callie Dillard - Sponsor
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- Jerel Walters – Senior Design I
- Dr. Michelle Londa – Senior Design II
- Dr. Patrick Thomas - Mentor