# *Improving PPLH Through Production Planning Using Power BI*

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## Abstract

This project presents a forecasting-based production planning system developed to improve Pounds per Labor Hour (PPLH) performance in extrusion manufacturing operations. A Power BI forecasting dashboard was developed using historical operational data from the Riverside and Fontana extrusion facilities. The system evaluates labor availability, forecasted pounds, scheduling conditions, and expected productivity performance under multiple shift scenarios. Operational filtering by press, shift, customer, die number, sales order, and labor headcount allows planners to evaluate manufacturing constraints and labor utilization in real time. Results demonstrated improved operational visibility, scheduling analysis, and productivity evaluation across multiple manufacturing variables.

## Introduction

- Extrusion productivity depends on labor utilization and scheduling efficiency.
- Traditional planning methods provide limited operational visibility.
- Power BI forecasting improves production planning and expected PPLH performance.

## Background

- Riverside facility includes Presses 1, 2, and 5.
- Fontana facility includes Presses 3, 4, 6, and 7.
- Production scheduling variability impacts operational productivity.
- Labor allocation directly affects expected PPLH performance.

## Problem

- Low operational visibility affects production planning.
- Manual scheduling methods reduce forecasting accuracy.
- Increased HC requires higher production pounds to maintain target PPLH.
- Scheduling inefficiencies create below-target work orders..

## Methodology

1. Historical extrusion production data was collected.
2. Power BI data models were developed using operational scheduling information.
3. DAX measures were created to calculate expected PPLH performance.
4. Multiple shift scenarios (8, 10, and 12 hours) were evaluated.
5. Dashboard filtering was implemented by:
   - Press
   - Shift
   - Customer
   - Die Number
   - Sales Order
   - Headcount (HC)
6. Forecasting results were analyzed to support production planning decisions.

## Results and Discussion

- Shift analysis supported labor utilization evaluation across multiple scheduling conditions.
- HC filtering demonstrated the relationship between labor allocation and required production output needed to maintain target PPLH.
- Dashboard analysis identified below-target work orders and operational scheduling constraints.
- Real-time filtering improved manufacturing visibility and production planning flexibility.

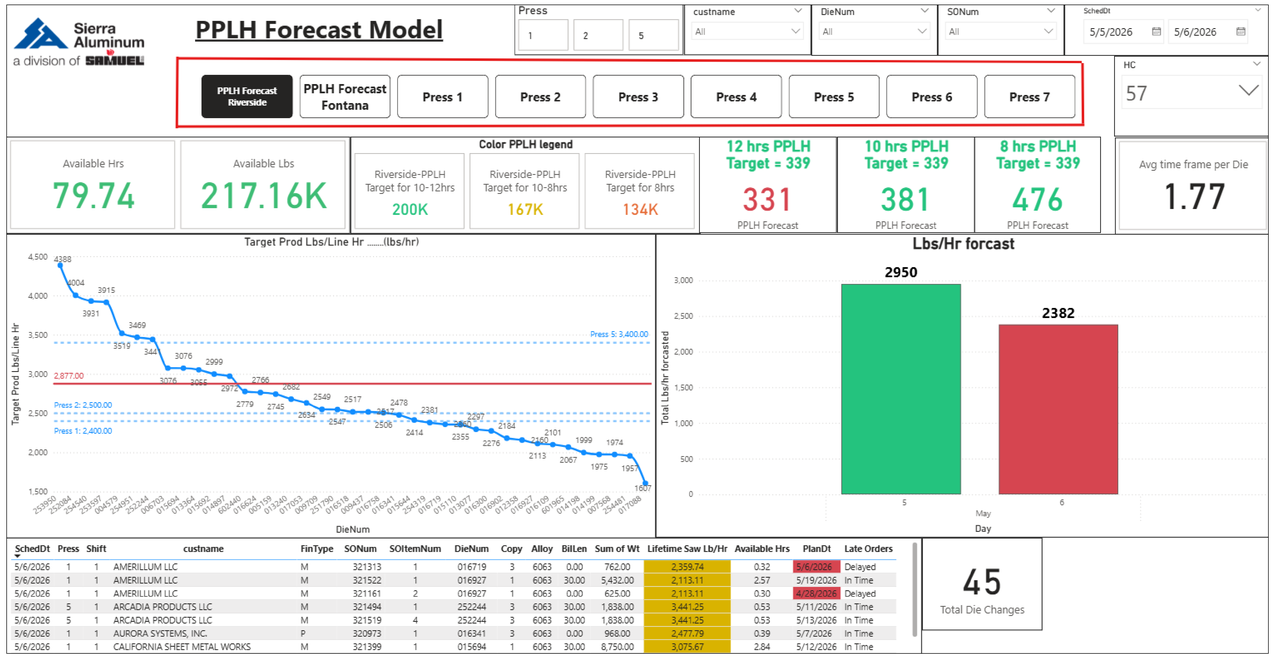
DAX Forecasting Measures

```
PPLH 8hrshift per WO =
  sum(sac_PressScheduleView[Wt]) /
  ( SUM('Press HC  X  HR SHIFT'[HRS 8 HR SHIFT]) )
```

```
PPLH 10hrshift per WO =
  sum(sac_PressScheduleView[Wt]) /
  ( SUM('Press HC  X  HR SHIFT'[HRS 10 HR SHIFT]) )
```

```
PPLH 12hrshift per WO =
  sum(sac_PressScheduleView[Wt]) /
  ( SUM('Press HC  X  HR SHIFT'[HRS 12 HR SHIFT]) )
```

PPLH Forecast Dashboard




## Conclusions

- Power BI forecasting improved operational visibility.
- PPLH forecasting supports labor allocation decisions.
- Shift analysis improved scheduling evaluation.
- Dashboard filtering improved operational traceability.

## Future Work

- Real-time forecasting integration
- Predictive scheduling optimization
- Machine learning forecasting models
- Expansion to additional manufacturing departments

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