

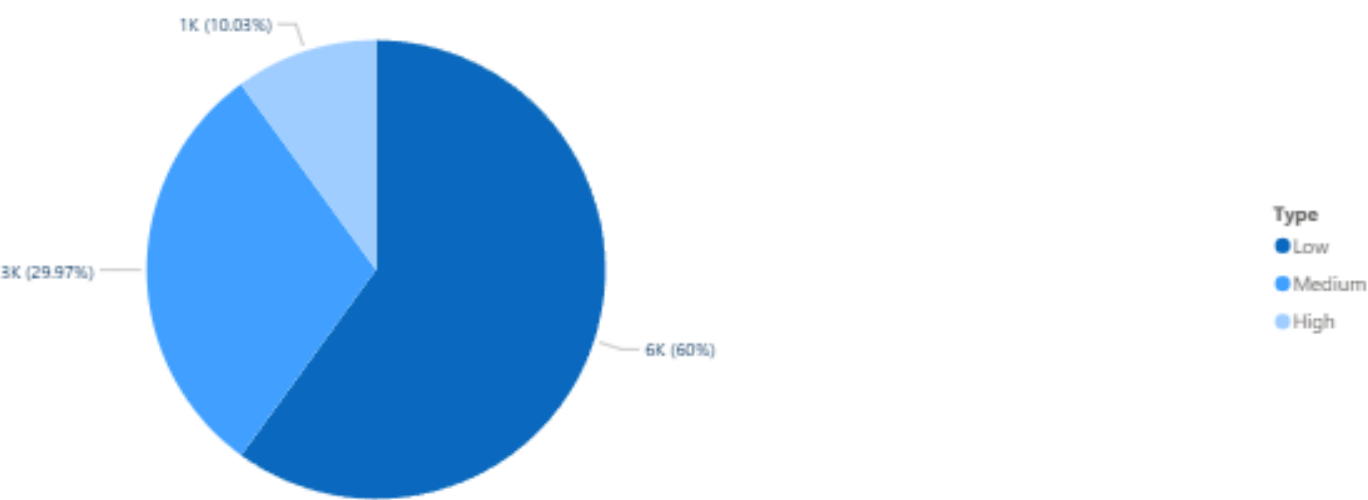
CASE STUDY

MANUFACTURING DASHBOARD

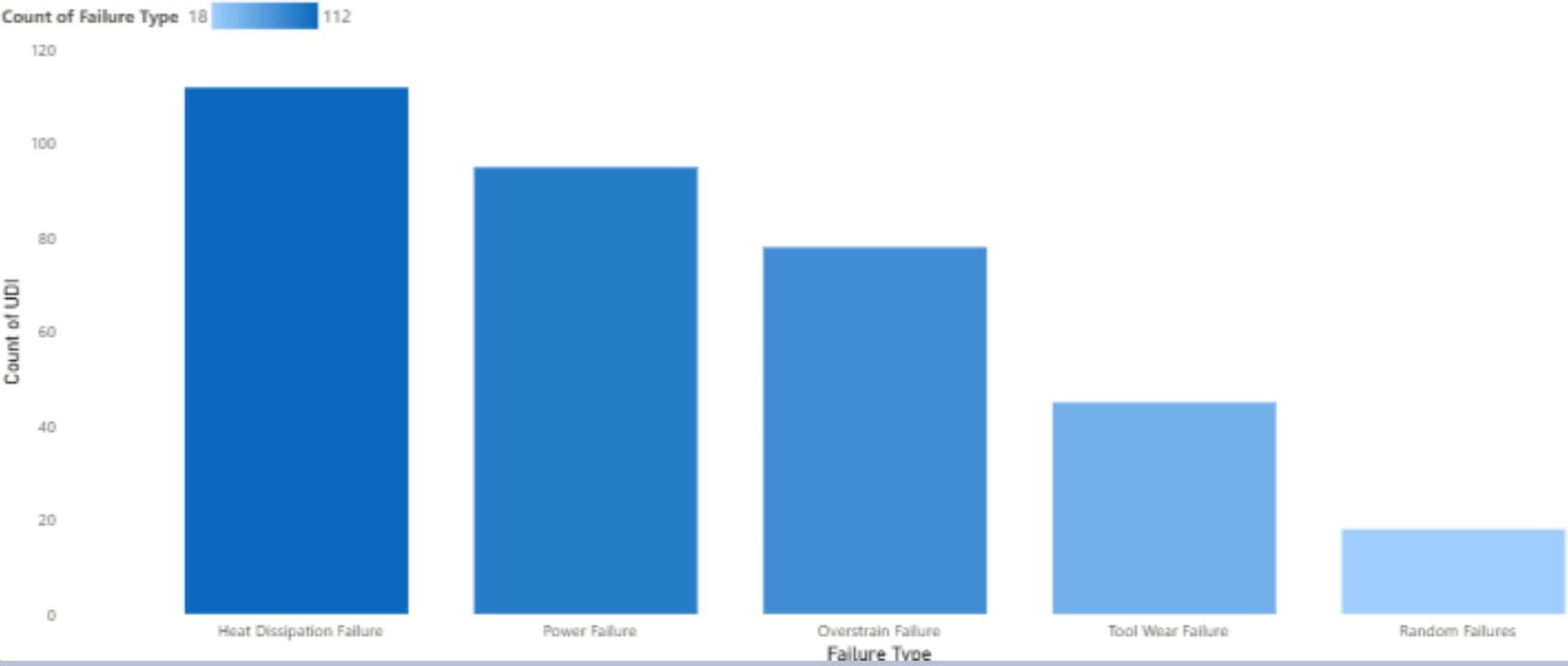


Total Failures	Total Machines	Failure Rate%
339 Count of UDI	10K Count of UDI	3.39% Failure Rate %

Product grade proportion

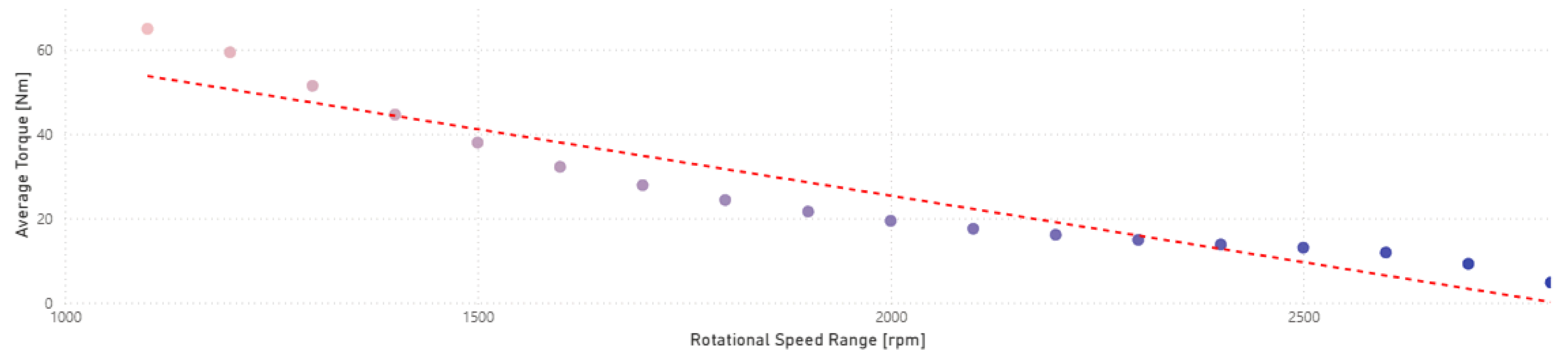


Failure Type Analysis



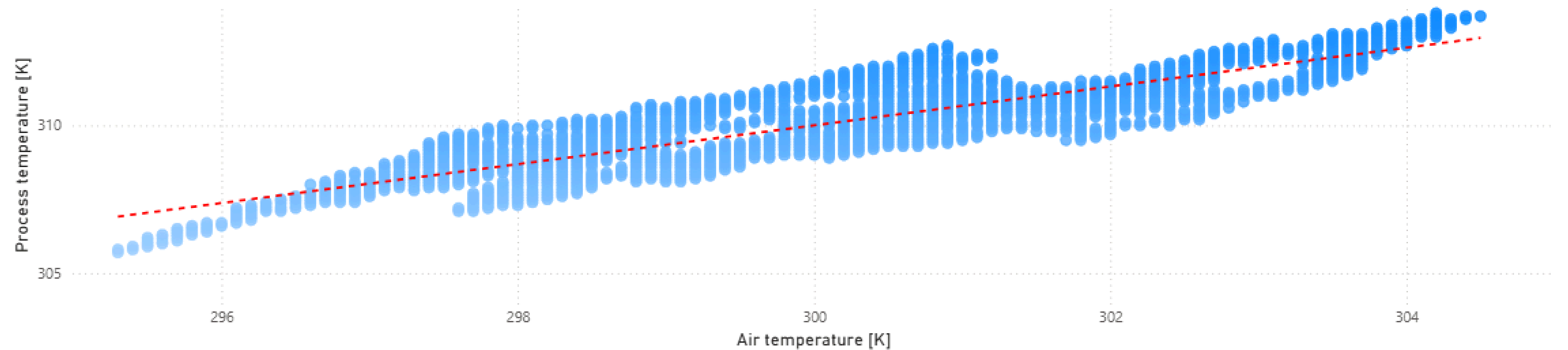
Correlation between Torque and Rotational speed

Average of Rotational speed [rpm] (bins) 1.10K 2.80K



Process vs. Air Temperature

Average of Process temperature [K] 305.70 313.80



INSIGHT INFORMATION

1. KPI CARDS (TOTAL FAILURES / TOTAL MACHINES / FAILURE RATE%)

"PROVIDES A HIGH-LEVEL SNAPSHOT OF MACHINE RELIABILITY, HIGHLIGHTING A 3.39% OVERALL FAILURE RATE ACROSS 10,000 UNITS."

2. PRODUCT GRADE PROPORTION (PIE CHART)

"DISPLAYS THE DISTRIBUTION OF PRODUCT QUALITY GRADES MANUFACTURED BY THE MACHINES."

3. FAILURE TYPE ANALYSIS (BAR CHART)

"PRIORITIZES THE ROOT CAUSES OF MACHINE BREAKDOWNS, IDENTIFYING 'HEAT DISSIPATION' AS THE PRIMARY TARGET FOR CI INITIATIVES."

4. CORRELATION BETWEEN TORQUE AND ROTATIONAL SPEED (TOP SCATTER PLOT)

"ILLUSTRATES THE INVERSE MECHANICAL RELATIONSHIP BETWEEN SPEED AND TORQUE TO ESTABLISH THE BASELINE OPERATING LOAD." (THIS MEANS AS SPEED INCREASES, TORQUE DECREASES, HELPING US IDENTIFY THE OPTIMAL 'SWEET SPOT' WHERE THE MACHINE CAN OPERATE EFFICIENTLY WITHOUT OVERHEATING OR EXCESSIVE WEAR.)

5. PROCESS VS. AIR TEMPERATURE (BOTTOM SCATTER PLOT)

"DEMONSTRATES THE LINEAR CORRELATION BETWEEN ENVIRONMENTAL AND PROCESS TEMPERATURES, USEFUL FOR DETECTING OVERHEATING OUTLIERS." (THIS DIRECT RELATIONSHIP ALLOWS US TO SET AN EXPECTED THERMAL BASELINE. ANY DATA POINT SIGNIFICANTLY ABOVE THIS LINE IS FLAGGED AS A 'HOT SPOT,' ENABLING US TO PERFORM PREVENTIVE MAINTENANCE BEFORE A TOTAL MACHINE FAILURE OCCURS.")

RECOMENDATION

BASED ON THE FAILURE ANALYSIS, I RECOMMEND PRIORITIZING HEAT DISSIPATION ISSUES AS THE PRIMARY IMPROVEMENT TARGET. THE DATA SHOWS THAT HEAT DISSIPATION ACCOUNTS FOR THE HIGHEST FAILURE COUNT AMONG ALL FAILURE TYPES, MAKING IT THE MOST CRITICAL FACTOR CONTRIBUTING TO OVERALL MACHINE DOWNTIME. BY ADDRESSING THIS ROOT CAUSE FIRST, WE CAN ACHIEVE THE MAXIMUM IMPACT ON REDUCING THE 3.39% FAILURE RATE AND IMPROVING OPERATIONAL EFFICIENCY.

TO COMPLEMENT THIS, I ALSO RECOMMEND LEVERAGING OUR THERMAL CORRELATION DATA TO IDENTIFY 'HOT SPOT' OUTLIERS FOR EARLY INTERVENTION. BY INTEGRATING THESE PREDICTIVE INDICATORS INTO OUR MAINTENANCE SCHEDULE, WE CAN TRANSITION FROM REACTIVE REPAIRS TO A PROACTIVE CI STRATEGY, FURTHER OPTIMIZING OUR 10,000-MACHINE FLEET.