Memo 7 – Plant Manager

Subject: Quantifying Project Risk – Monte Carlo Simulations
From: Ethan Beets, Plant Manager

In 2021, we used Monte Carlo simulations to assess the financial risks of the paint booth project. Running the model in **Google Colab** with optimistic, pessimistic, and most likely cost estimates gave us a clearer view of the full cost range, rather than relying on single-point figures.

Monte Carlo remains one of the most effective tools for forecasting project risk. By simulating thousands of scenarios based on probability distributions, we can evaluate expected outcomes and the likelihood of high-cost events. This approach better reflects real-world uncertainty than static estimates.

To move forward in 2024, I've updated our risk distribution data. You'll find both the summary below and a CSV file in the resources section that you'll need to download.

2024 Risk Distributions				
Risk	**Min**	**Most Likely**	**Max**	**Likelihood**
Permits	$150	$575	$1,000	0.5
Facility Prep	$2,000	$7,000	$12,000	0.2
Equipment Rentals	$250	$1,125	$2,000	0.5
Installation	$1,000	$4,000	$7,000	0.8

Your objective is as follows:
1. Download the new 2024 risk distribution CSV from the resources section.
2. Upload it into your Google Drive.
3. Open the provided Google Colab template.
4. Replace the 2021 data in the template with the 2024 data you've just downloaded.
5. Run the simulation and generate an updated graph showing the risk-adjusted cost distribution.

This will give us a realistic view of potential cost exposure for the upcoming project and help leadership decide on a prudent budget contingency.

Tip: If you get stuck, try using Gemini in Google Colab to help you adjust your code. When we first ran these simulations back in 2021, AI tools like that didn't even exist!

Best,
Ethan