Problem Statement Worksheet

How can we determine the origin of the 15% failure rate in the manufacturing process of the NSC's InSense sensor by April the 3rd?

1 Context

NSC's product InSense sensor currently has a manufacturing fail rate of 15% when in early-stage testing it was around 1%-2%. Prior testing to identify the cause of these failures have not been successful. It is believed failures can arise from a combination of faulty parts and poor manufacturing, or specific to one factory.

It is essential to determine a) what manufacturer to shut down or b) what parts supplier to stop buying from. Subsequently, the goal will be to get the failure rate below 5%.

There are financial benefits for this business initiative, NSC has massive orders for this product from three accounts that need to be met.

2 Criteria for success

Success will be measured in our capacity to:

a) Detect the origin of the failures
b) Provide a solution that can reduce failures to less than 5%

3 Scope of solution space

Our scope will be on the manufacturing process for the InSense sensor (not the Lithbat).

4 Constraints within solution space

The data received is an export with a limit of 20K rows, some useful information might have not reached us.
Manufacturing department might see the request as a witch-hunt.
Time-bounded request (received Thursday April 2nd at 7:32 AM, solution to be presented on Friday April 3rd afternoon), any delay can be critical

5 Stakeholders to provide key insight

Manufacturing Department for details on production:

- Shane Buchholz – Head Engineer
- Gary Neumont – Head of Manufacturing
- Jessica Jones – QA/QC Engineer

In case further information or support is required to access data:

- Tony Abraham – InSense VP (has access to more data)
- Vince Maccano (Head of Data Science)

6 Key data sources

Data from Cert in excel format (20k rows). Where fail rate is labeled with "STATUS". Data is provided for each sub-part of the product (there are 26 suppliers for 7 sensor parts). The data covers manufacturing dates going back two quarters with dated results for testing.