RELIABILITY ANALYSIS OF CRITICAL SYSTEMS

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CLIENT OVERVIEW

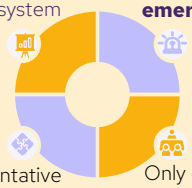
Global Biotechnology company that develops **cancer treatments**

14 Day continuous production cycle

CURRENT STATE

Inconsistent data entry in new data system

Equipment failure → **emergency shutdowns**



Corrective & preventative maintenance done **as needed**

Only **one** team member with comprehensive knowledge

GOAL

Improve Seagen's understanding of critical equipment to **reduce system failure** and **evenly distribute knowledge**

OUR PLAN

Standardize Knowledge → Improve Visibility of Critical Systems → Improve Reliability

SYSTEMS ANALYZED

- Process Gasses
- Purified Water
- Air Handling Units
- Water for Injection
- Clean Steam
- Reverse Osmosis Deionized Water (RODI)

DELIVERABLES

1 Equipment Master Sheet

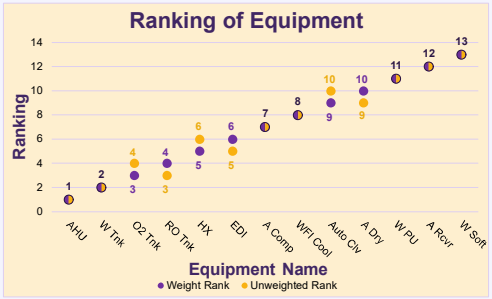
System	Equipment	Asset #	Mfg	Model	Redundancy	Location
Purified Water	Heat Exchanger (Cool)	509473	Xylem	C100-TEMA AEP	No	Rm 110

2 Ranking Equip. & Sensitivity Analysis

Google Form – Teams ranked 13 pieces of equipment based off their knowledge

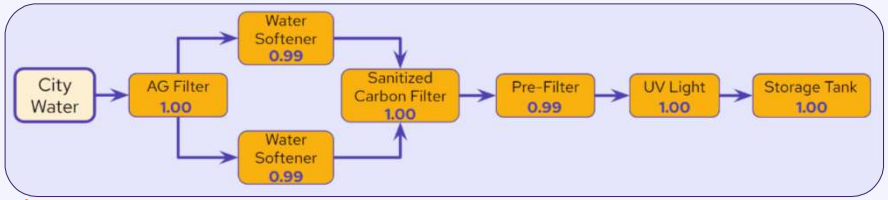
Sensitivity Analysis - Weighing responses of 2 knowledgeable team members

Sensitivity Analysis – Criteria (business, quality, Mean Time To Failure, etc.)



Ranking Chart: Results from weighing two team member's ranking of equipment highest, with 1 being highest priority and 13 being lowest priority for the maintenance team (e.g., O2 Tank is more important than RO Tank,).

3 Reliability Block Diagram (RBD) & Simio



A Used annual CMs* & PMs* work orders for MTBF and MTTR

B Used MTBF and MTTR to get the reliability for the system

C Validating the RBD with a simulation (used Simio)

*CM = Corrective Maintenance, PM = Preventative Maintenance

IMPACT

100% Implementation of **equipment ranking**

11% of data **flagged as inaccurate**

> $1.2 mil In **cost savings** per batch of product. Amount at risk during a system failure

RECOMMENDATIONS

1. Cross Check Data
2. Continuously Update Deliverables
3. Monitor priority equipment (low MTBF)
4. Increase Equipment Redundancy

ACKNOWLEDGEMENTS

- Dr. Patricia Buchanan
- Dr. Christina Mastrangelo
- Dr. Eli Patten
- Michelle Song
- Seagen