PARSONS

Salt Waste Processing Facility

SWPF Programmatic Spare Parts and Risk Reduction

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Question 1

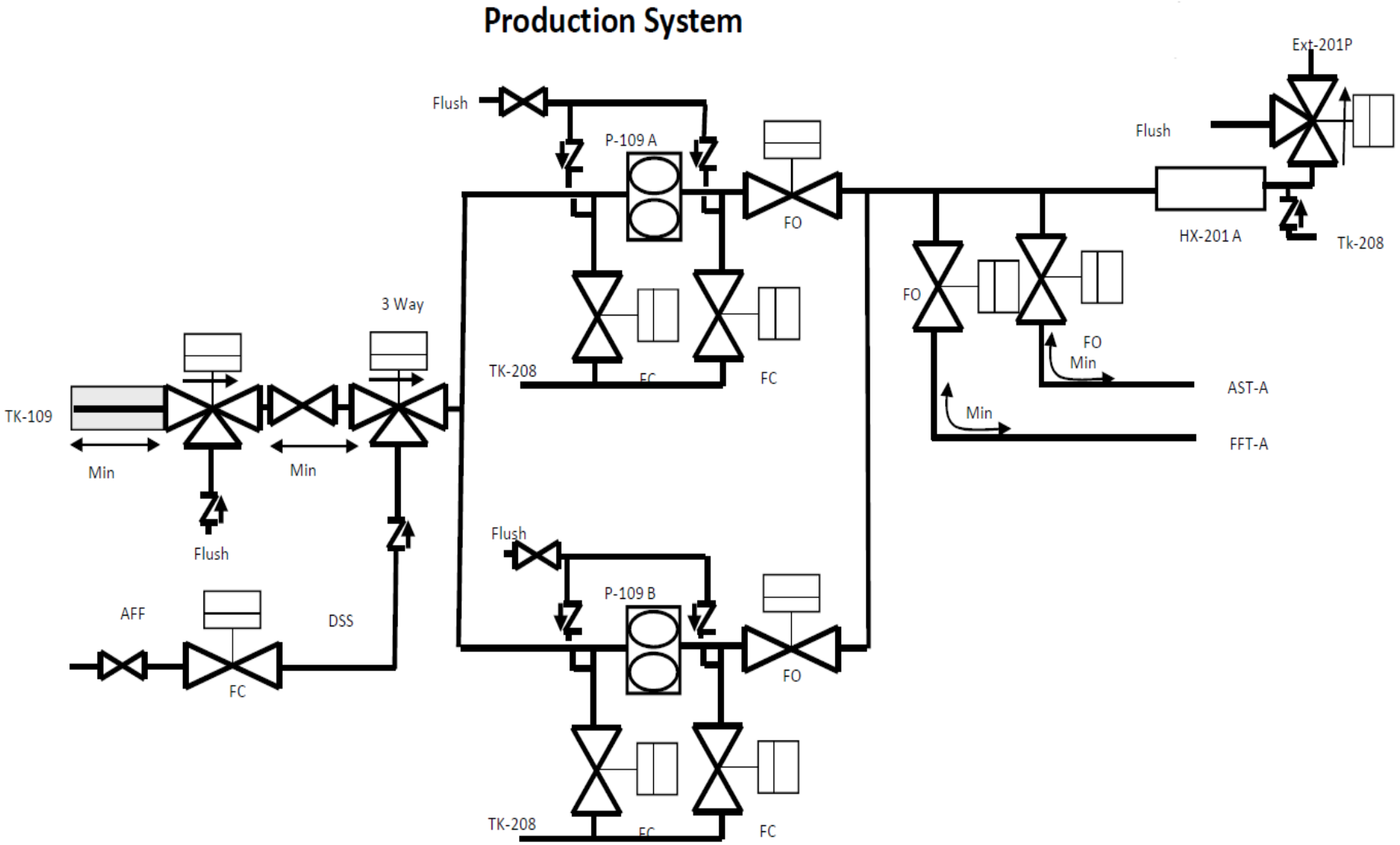
1) Describe how projected life expectations are determined and then utilized in the development of a list of spare equipment and spare parts.

Sources of Information:

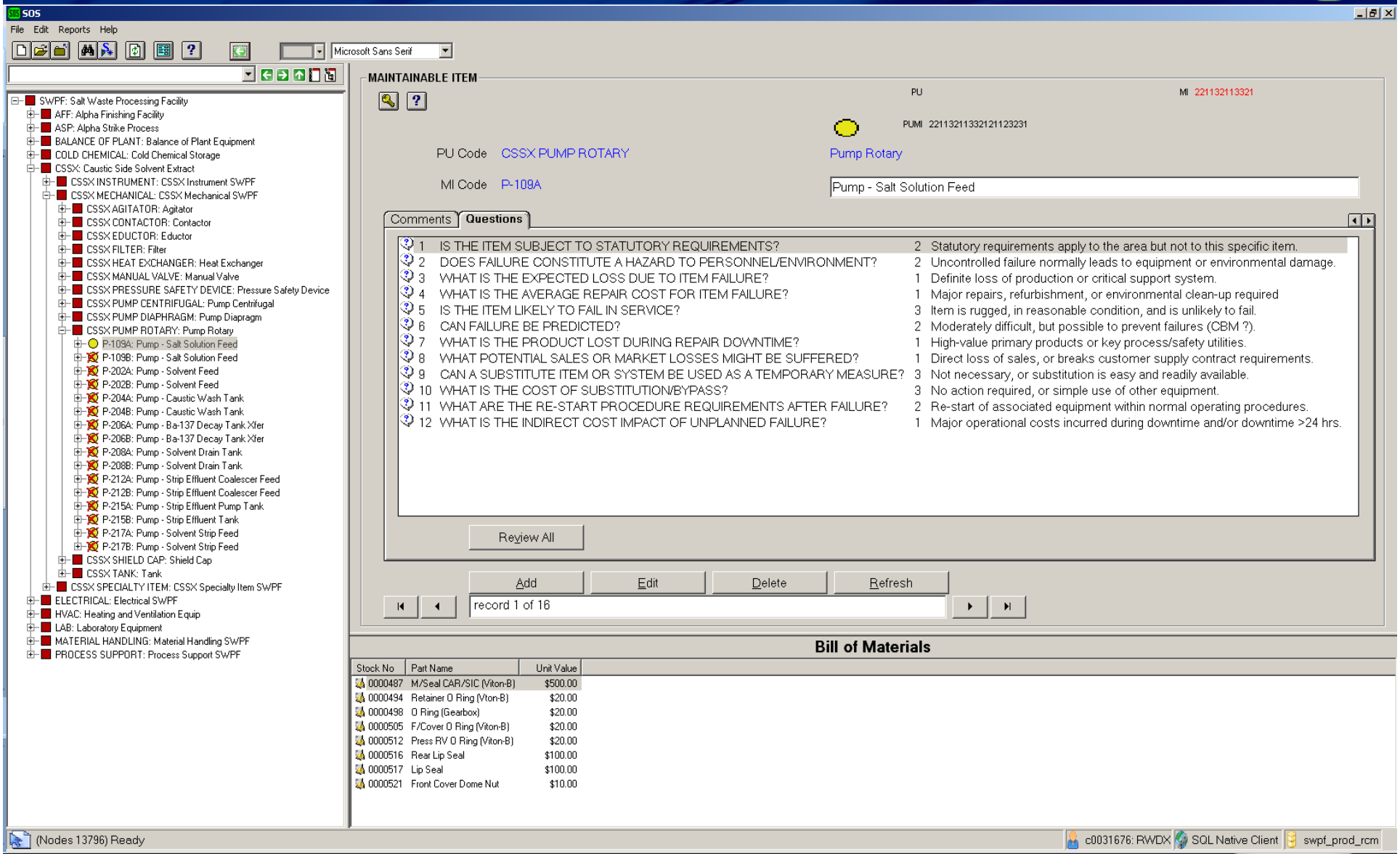
- Operational Assessment and Tank Utilization Model (P-ESR-J-00003)
- Industry and Vendor Information
- Operational Experience from similar plants
- Reliability and Maintainability Evaluations at Parsons Technology Center

Spares Optimization Where to Start?

Start at the Beginning with the Production System

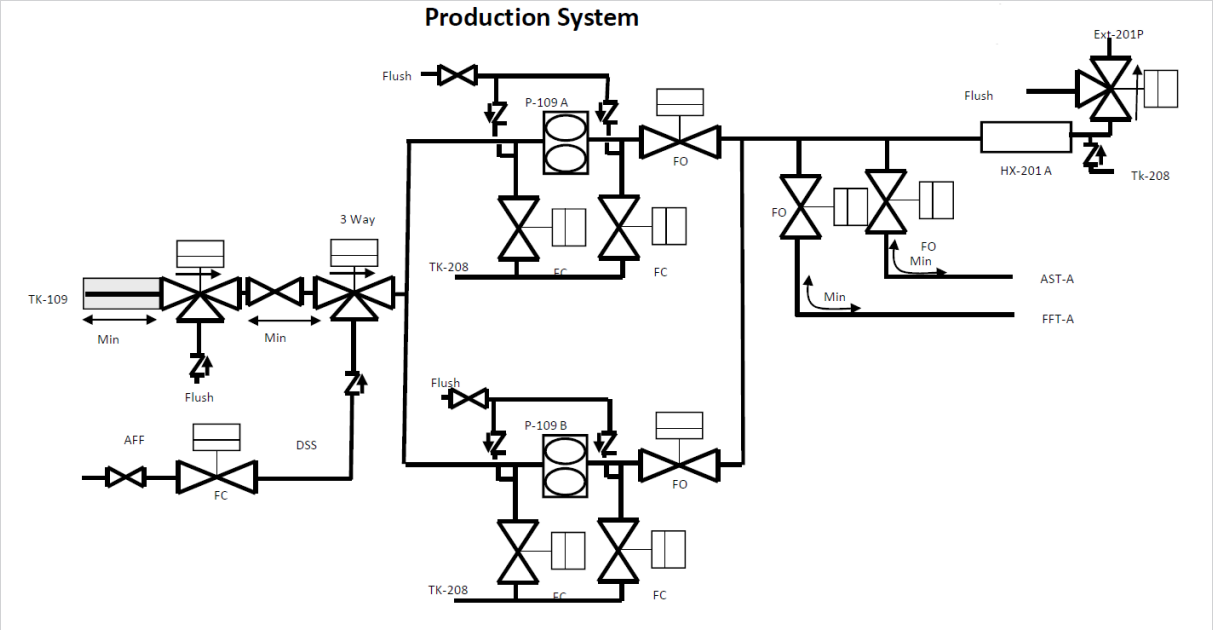


Maintainable Item Questions



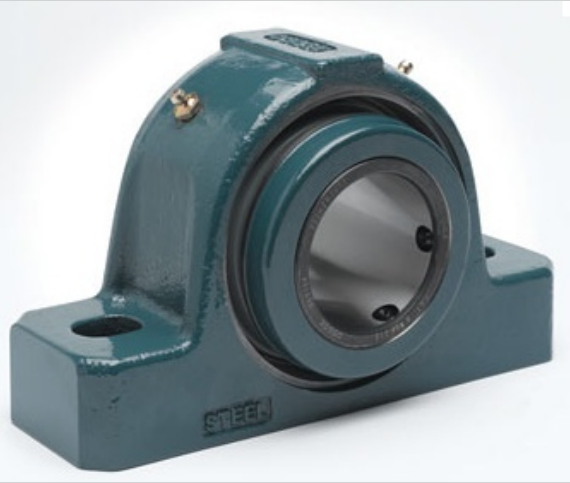
Spare Parts Considerations

- How these parts affect the equipment
- How does the equipment effect the production system
- How does the production system effect overall production capacity of the plant.



Criticality of the Spare Part

- When we consider how to stock a part we often start with the part itself, i.e. how expensive is it, how much lead time is involved in reorder, how often we use the part, how hard is it to find. While all these are valid questions they are not what should be the first concerns when formulating a stocking policy



How Does the Spare Part Fit In

PLANT PRODUCTION

Production Unit

Production Unit Break Down Cost

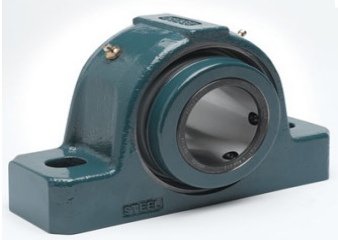
Production Unit Criticality Profile

Maintainable Item

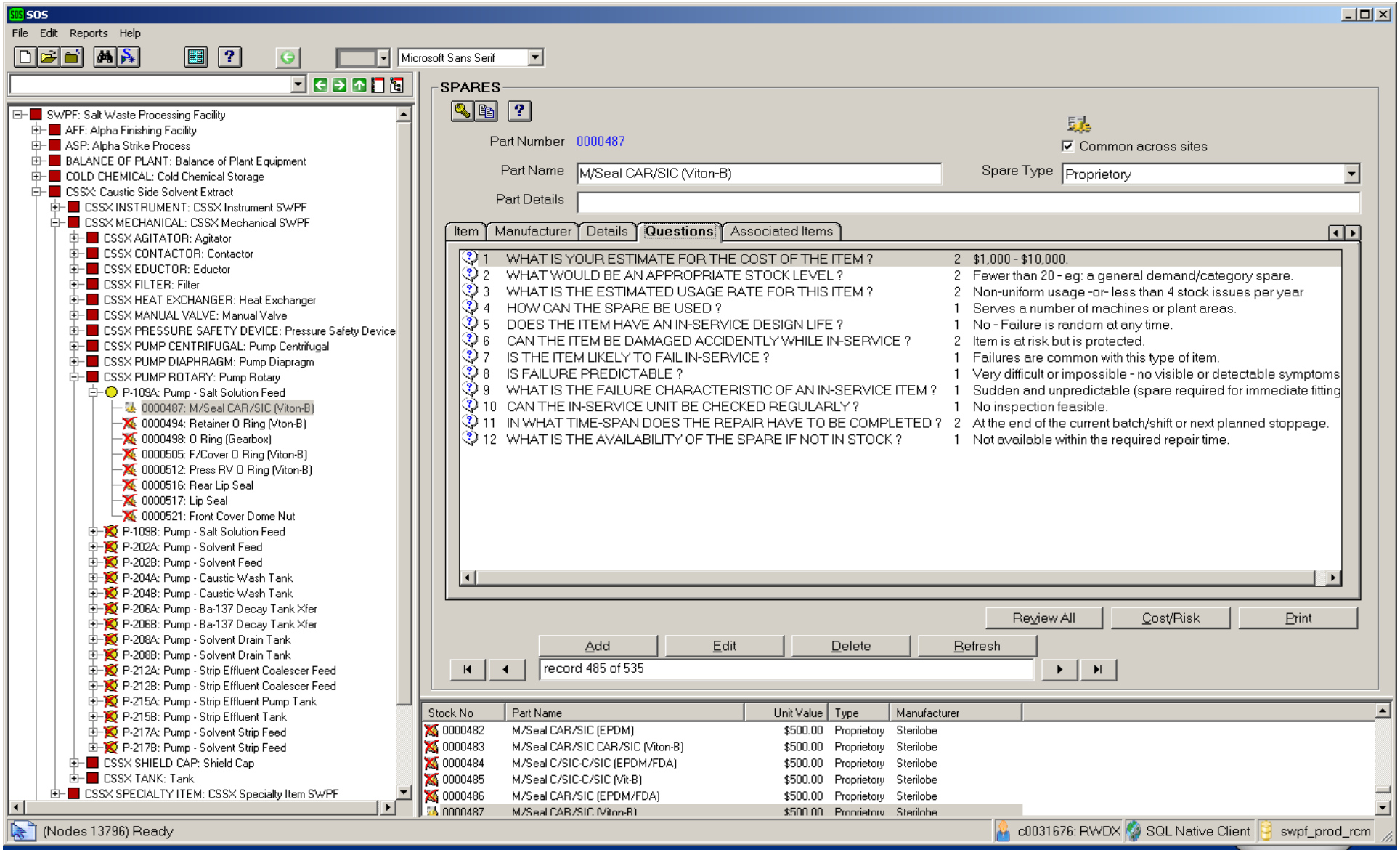
Maintainable Item Break Down Cost

Maintainable Item Criticality Profile

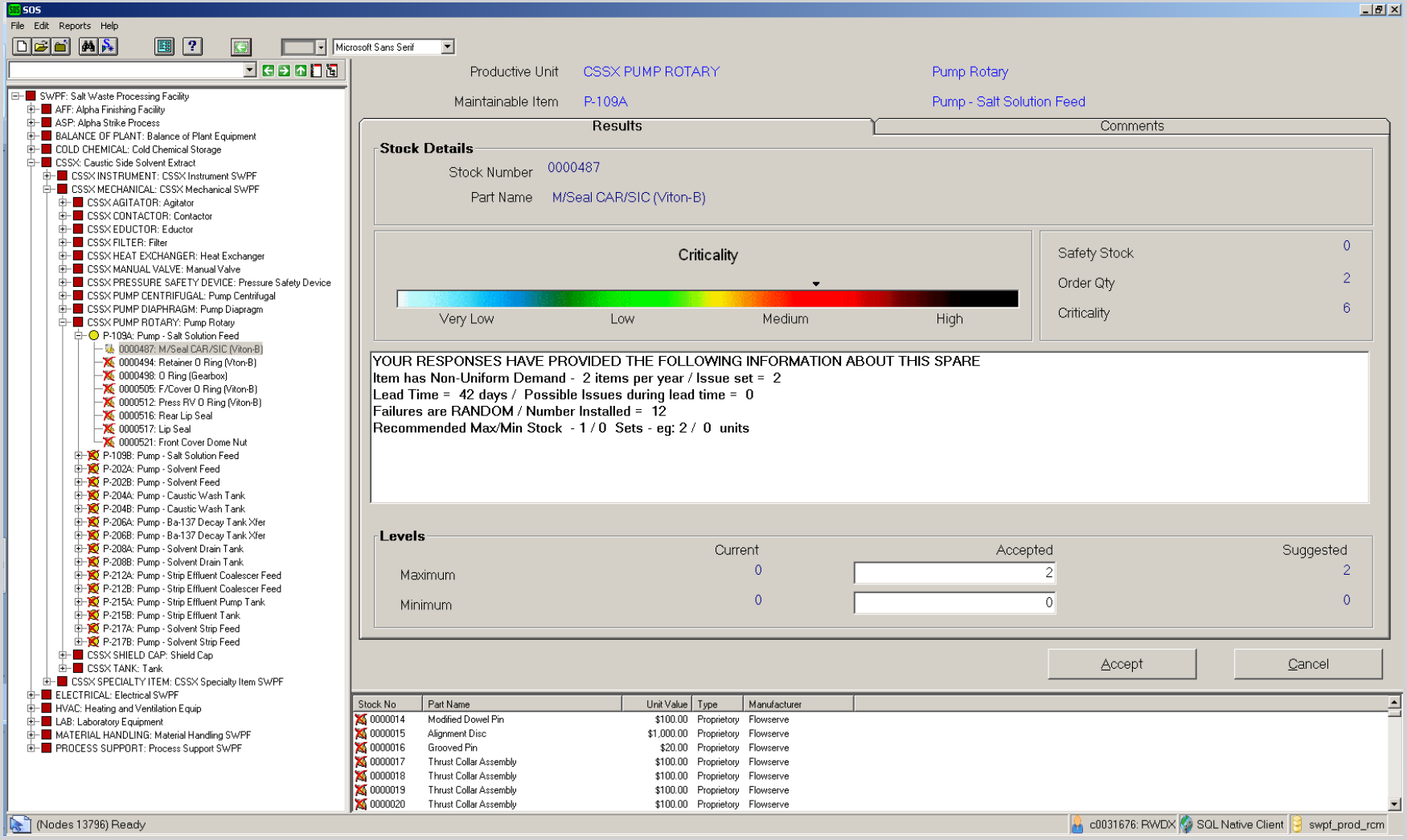
SPARE PARTS



Spare Part Questions



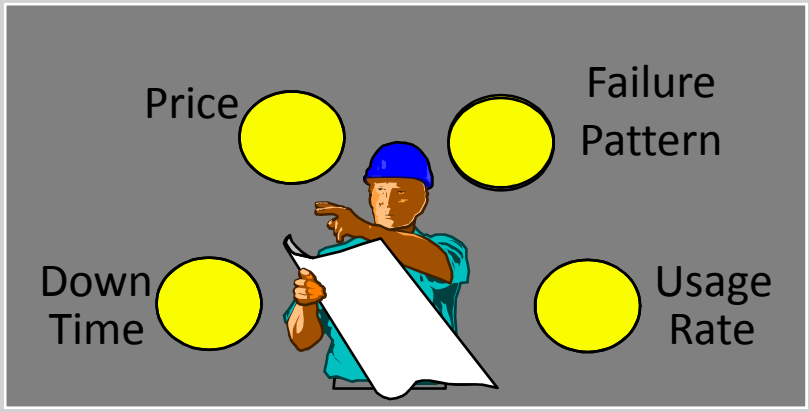
Suggested Spares Level



Why Use an Expert System?

Typical "Human" Decision Process:

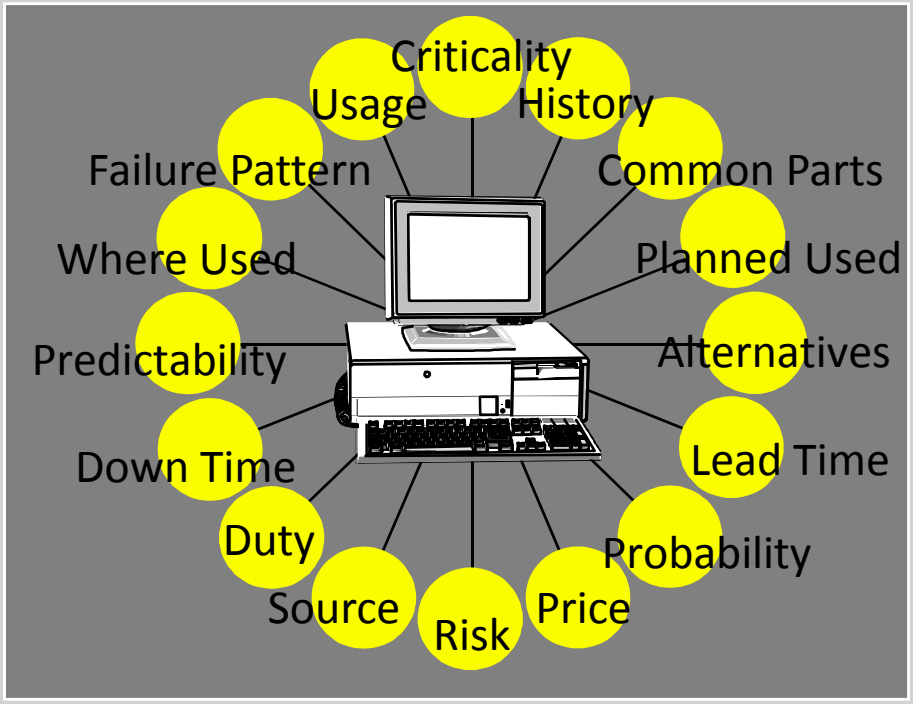
- Limited # Of Variables Considered
- Inconsistent (Often Emotional) Process
- Decisions Based On "Gut" Feel Or Experience
- Seldom Documented



Using an Expert System

Computerized Decision Support Process Yields Decisions That Are:

- More Valid
- Easier To Make
- Faster
- Documented
- Repeatable



Benefits of this type of Analysis.

- Scientifically calculated Max / Mins
- Auditable, repeatable, consistent
- Objective Assessment / unemotional
- Business-based decisions
- Better, optimized spares mix
- Shortening of costly delayed re-starts.
- Eliminate Unnecessary Carrying Cost
- Better use of working capital

Examples of the Benefit of Spares Optimization

MAJOR POWER GENERATION FIRM (TVA)

- Reduced $170 Million over a 5 year plan (achieved in 4 years) for its 29 plants, while increasing system availability uptime

GLOBAL MINING FIRM

- By utilizing SOS we reduced $60 million in planned purchases AND added in some(around $1 million) that were missing /should have been in inventory.
- Mobile equipment availability increased 4% which translated into tens of millions of dollar improvements

Questions

- 2) Describe how the spare equipment and/or spare parts program is or is not consistent with shorter life history scenarios.

- 3) Identify areas of significant risk reduction and explain how these risk reductions relate to the spare equipment and spare parts budget.

Risk Reductions

- Comprehensive Reliability and Maintainability Testing at Parsons Technology Center
  - Extended Sleeve Valves
  - Manipulator Testing
  - Contactor Performance Testing
- Maintenance Trial Test Plan
  - Numerous maintenance trials planned during testing phase e.g.
    - Cross Flow Filter Removal/Replacement
    - Contactor Removal/Replacement
    - Strip Effluent Coalescer

Risk Reductions Continued

- Extensive continuous condition monitoring on equipment not routinely accessible during normal operation e.g.
  - Vibration monitoring on contactors and all rotating equipment in pump and valve labyrinths
  - Trending equipment performance using data historian within DCS
  - Troubleshooting and Diagnosing Valve and Instrument activities using AMS Intelligent Device Manager (a function of the Delta V DCS software)