

Executive Summary

The goal of this project was to capture CO₂ from a silicone manufacturing process, purify it to beverage grade, and store it for reuse.

Introduction & Background

The CO₂ is used to cool silicone mixes. This is a large cost to the company, by recapturing, cost and environmental impacts should be minimized.

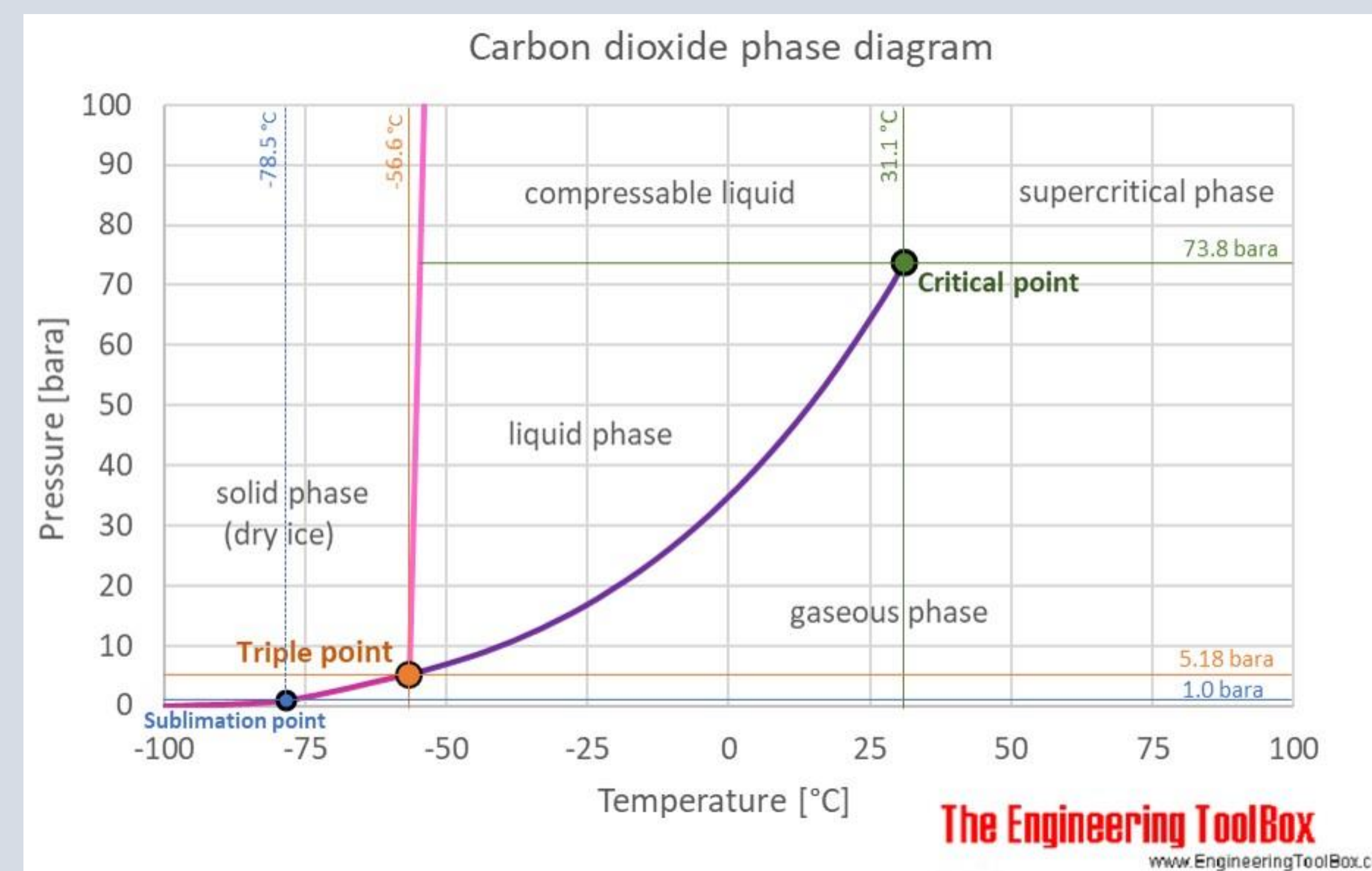
Process Description

- Cryogenic Process
- Four stages of compressing and cooling
- Produces 3,200 lb/hr of 99.8 wt %
- Recovery of 76%
- Dynalene MV™ fluid for cryogenic conditions
- Cryogenic fluid recycled in closed system

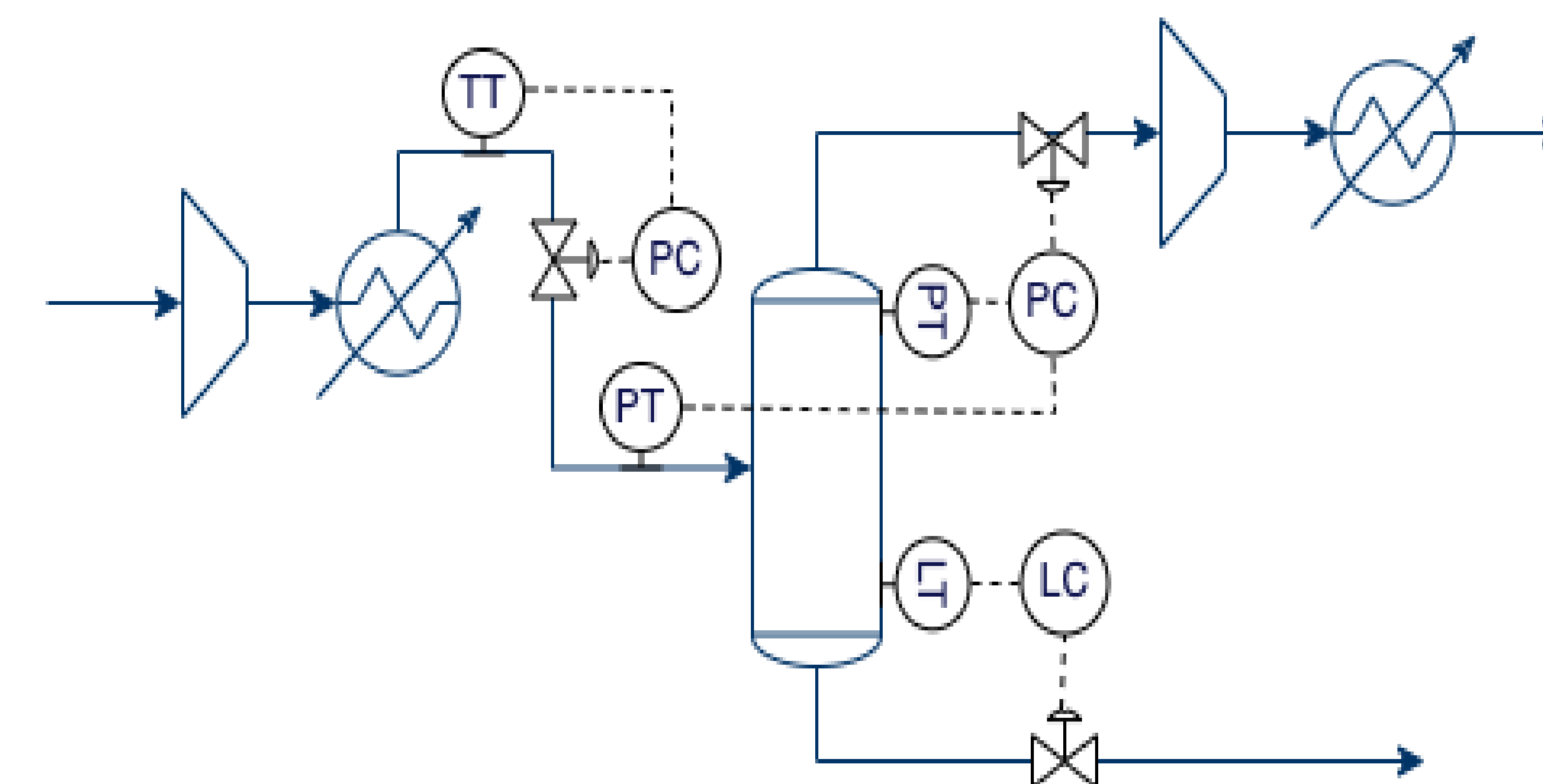


Safety Considerations

- Hazards: Extreme pressures and temperatures, harmful constituents (chloroform, benzene, etc.)
- Solution: Inherent safety through controls



Instrumentation & Controls



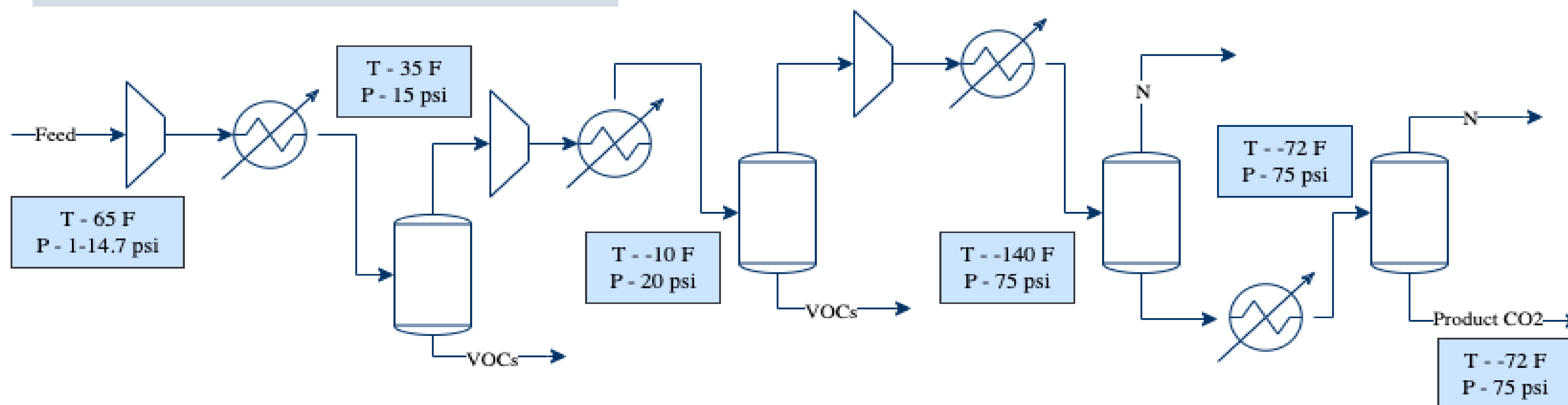
Conclusions

This design has a total FCI of \$6.3MM. An estimated savings of \$5.5MM with an interest rate of 10% over 25 years was calculated based on current CO₂ cost. Using this as a "budget", the design is over by \$800K. To make a profitable design, we recommend the company investigate producing their own liquid CO₂ onsite.

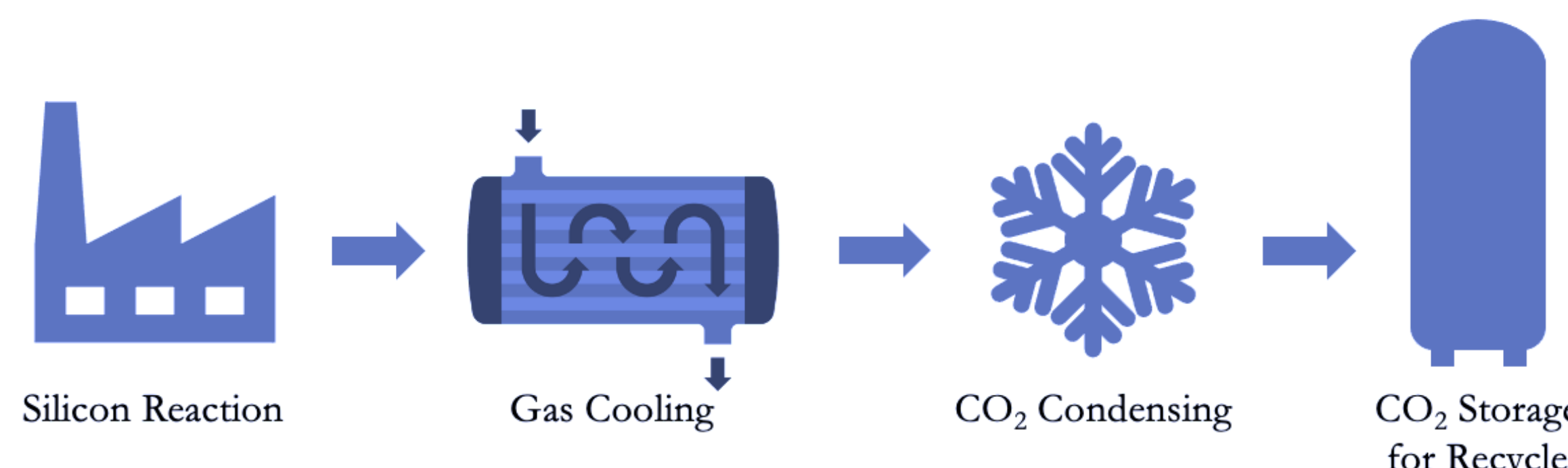
Acknowledgements

J. Wagner, J. Borden, J. Raymond- Senior Project Advisors
A. Hersel- Heat Transfer Consultant
D. Long, R. Oliver, R. Vincent- Company Contacts

Process Flow Diagram



Cryogenic Carbon Capture



The Team

