



Sandia Status Report on First Compression Spin Tests and Results Using the SNL SCO_2 Compression Loop

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Sandia is a multiprogram laboratory operated by Sandia Corporation,
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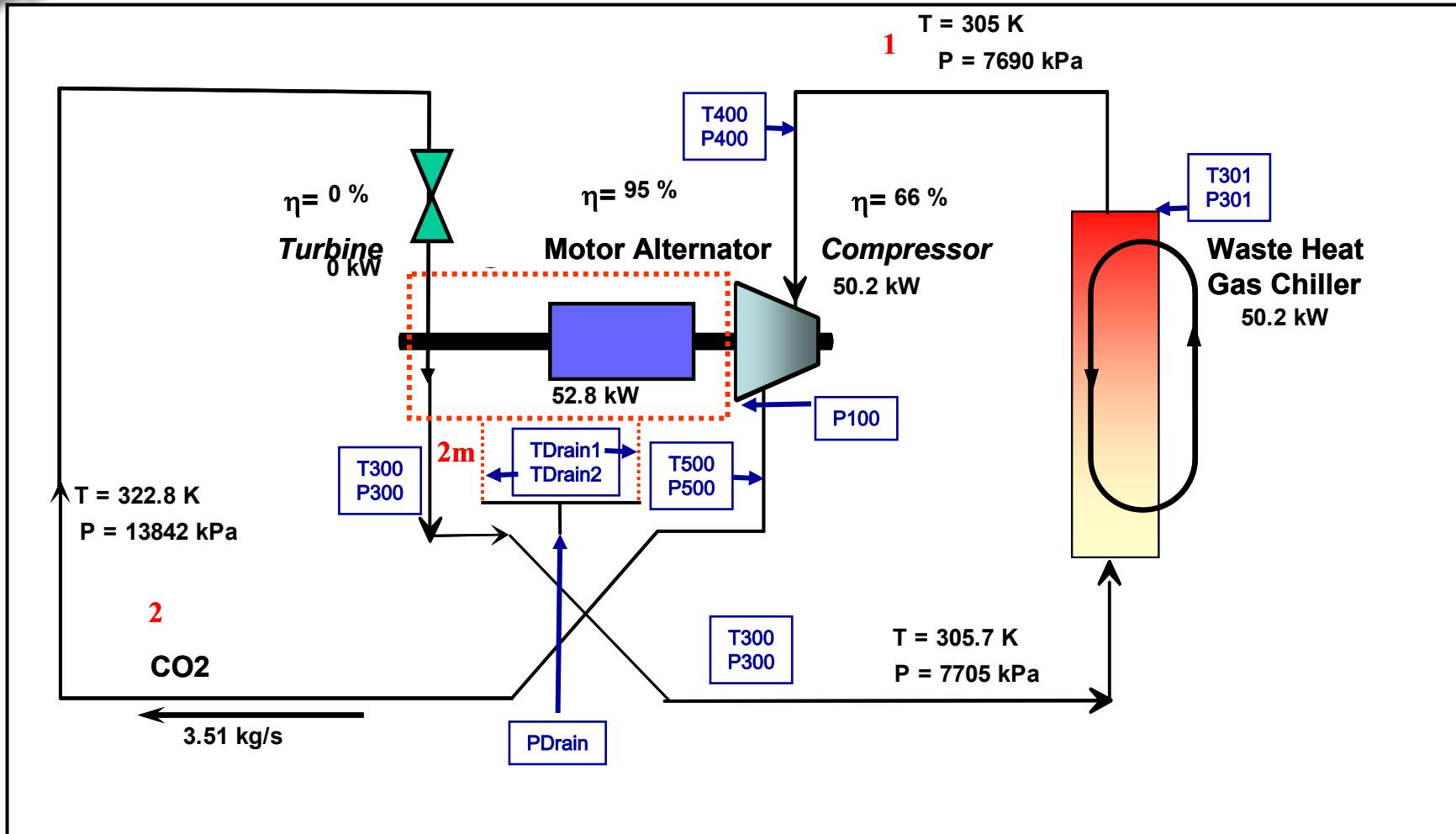


Introduction

- **Sandia Supercritical Compression Loop**
 - **Schematic of Compression Loop**
 - **Engineering Drawings and Photos of Loop and Instrumentation**
- **Test Results Summary**
- **Summary and Conclusions**



SNL Supercritical CO₂ Compression Loop

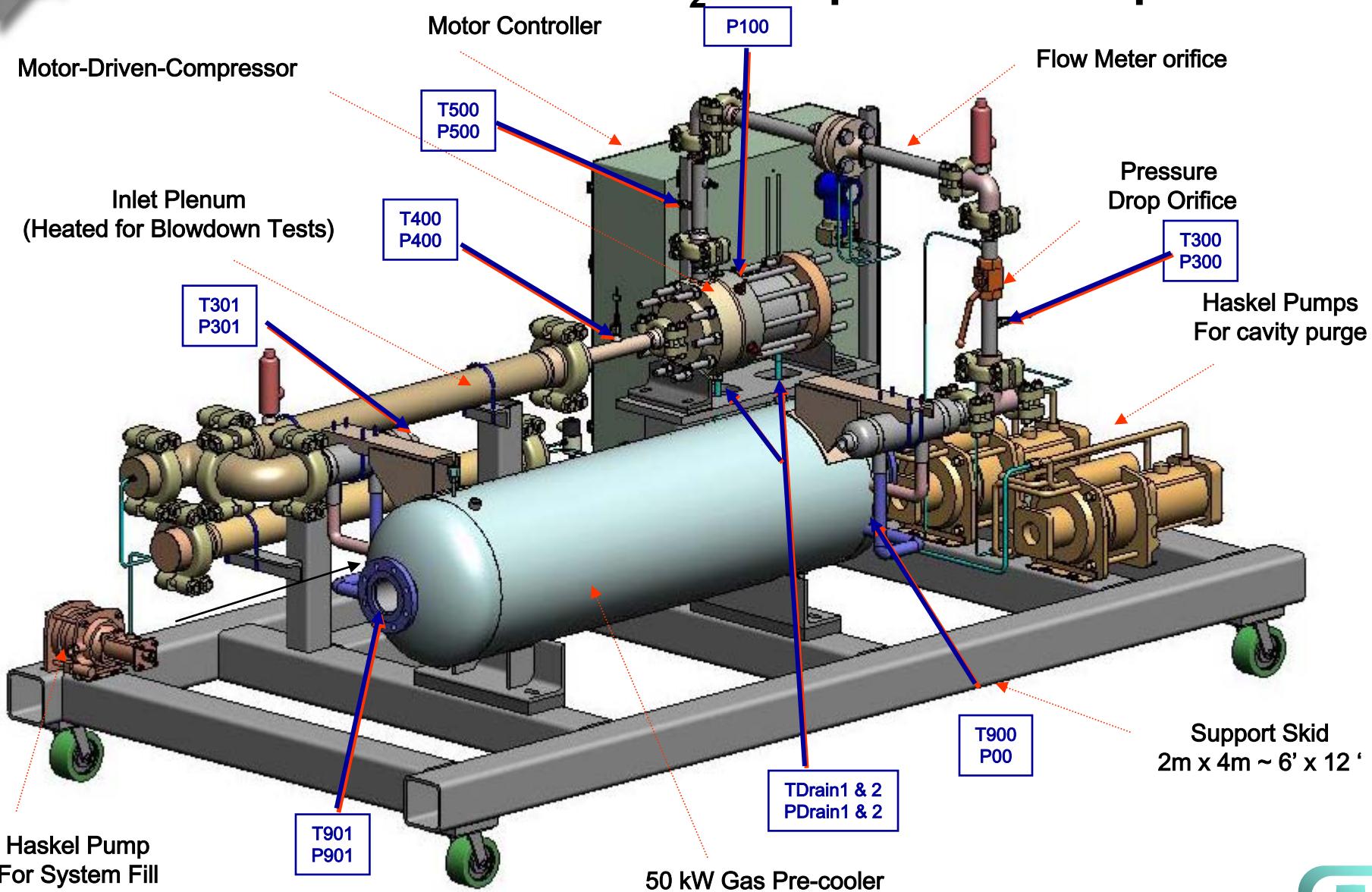


- **Compression Loop Configuration**
- **Nomenclature**
- **Instrumentation Names and Locations**





Engineering Drawing of Sandia's SCO_2 Compression Loop





Sandia Supercritical CO₂ Compression Loop Configuration





Summary of Test Data

- **High Pressure Spin Tests up to 30,000 rpm and 800 psia**
 - **Design Conditions are 75,000 rpm and 1100 psia**
 - **Tests Measurements provide**
 - **Leakage Rates Through Supercritical CO₂ Gas Seals**
 - **Power Loss Measurements**
 - **Relative Electrical Losses : Friction Losses: Windage Fraction**
 - **Measured Compressor Flow Map Data at Low RPM and Pressure**
 - **Data are Consistent with SNL's Compressor Mapping Analysis**





Conclusions and Next Steps

- **Sandia Supercritical CO₂ Compression Loop is Operating**
- **Generally good agreement between Compressor Models and Compressor Map Measurements at Low Pressure and at Low Shaft Speed**
- **Next Steps**
 - **Increase shaft speed and fill pressure**
 - **Complete Compressor Performance Mapping**
 - **Add in more components**
 - **PCHE Gas Chillers, Heaters, Recuperators**

