PROPULSION 400 AREA LARGE ALTITUDE SIMULATION SYSTEM

SUMMARY

The 400 Area Large Altitude Simulation System (LASS) is designed to provide altitude to the large vacuum chamber test cells in the 400 Area to test rocket engines up to 15,000 lbf.

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The three-module chemical steam generator powers large, two-stage ejector sets of the altitude simulation system. The number of modules fired, the replaceable nozzles and throat sections of the large ejectors, and the interchangeable diffusers allow optimization of the entire steam system to engine requirements.

Each module

- Produces 82 kg/s (180 lb/s) of steam at 2 MPa (300 psi), 309 °C (527 °F)
- 222 MW (~23,000 bhp)
- Consumes 20 L/s (275 gal/min) liquid oxygen
- Consumes 12 L/s (170 gal/min) isopropyl alcohol
- Vaporizes 66 L/s (900 gal/min) water

Duration and thrust level maximum

- One module: 120 min at 18 kN (4000 lbf)
- Two module: 60 min at 33 kN (7500 lbf)
- Three module: 20 min at 67 kN (15,000 lbf)

Available diffuser sizes limit maximum engine nozzle diameter

- 77 in. vertical (2)
- 62.5 in. vertical (1)
- 42.5 in. horizontal (1)
- 36 in. vertical (2)
- 36 in. horizontal (1)

The system provides a start altitude of approximately 35,000 m (115,000 ft). It maintains Test Stands (TS) 401, 403, or 405 at greater than 30,500 m (100,000 ft) during rocket engine firing. TS-405 can support substantially higher thrust levels when testing solid rocket motors.

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