

N95- 13601

HIGH-SPEED SEAL AND BEARING TEST FACILITY

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HIGH SPEED SEAL/BEARING RIG AGENDA

BACKGROUND

PROJECT STATUS

FACILITY FEATURES

RIG CAPABILITIES

EMD ADVANTAGES

FUTURE OPPORTUNITIES

HIGH SPEED SEAL/BEARING RIG BACKGROUND

- **PRIMARY GOAL:** Off-Turbo Measurement of Parasitic Power Losses
- **SECONDARY GOAL:** Validation of Seal and Bearing Calculation Techniques
- Provide Quick Turnaround Test Bed for Prototype Designs
- Design Verification and Continuous Improvement
- (Rotor Dynamics Studies Done in Separate Test Facility)

HIGH SPEED SEAL/BEARING RIG PROJECT STATUS

AUGUST 1991	Preliminary Design/ Specification Begins
JULY 1992	Contractor Design Begins
AUGUST 1993	Installation at EMD Begins
TODAY	Checkout/Demo Phase Add-On Modules In Process Inquiries Invited

HIGH SPEED SEAL/BEARING RIG FACILITY FEATURES

PRIME MOVER	VFD Controlled 42 HP 28000 RPM Motor
MODULAR SETUP	Separate Test Article Housing Two Independent Lube Systems
AXIAL POSITIONING AT SPEED	Stepper Motor .001" Increments
DATA ACQUISITION	Fluke 2286 With Toshiba EX40 PLC

HIGH SPEED SEAL/BEARING RIG TEST RIG CAPABILITIES

SEAL CHAMBERS	3 Separately Controlled for Pressure and Temperature
AIR FLOW	100 SCFM to 35 PSIG and 300 F 100 SCFM to 5 PSIG and 600 F
TEST OIL	12 GPM TO 100 PSIG AND 260 F
IN-LINE TORQUE METER	100 LB-IN
RADIAL LOADS	200 LB
AXIAL LOADS	TO 5000 LB

HIGH SPEED SEAL/BEARING RIG CAPABILITIES, CONTD.

<u>FEATURE</u>	<u>CURRENT DIMENSION</u>	<u>GROWTH TO</u>
BEARING BORES	TO 3"	5-6"
BEARING LENGTH	TO 3"	5-6"
THRUST BEARING OD	TO 7"	13"
SEAL BORE	TO 13"	15"

NEW MODULES POSSIBLE - CASE BY CASE

HIGH SPEED SEAL/BEARING RIG EMD TESTING ADVANTAGES

- **Save Capital \$ and Startup Costs**
- **30 Years EMD Turbo Experience**
- **Pragmatic Approach – Development Oriented**
- **Try Out Experimental Designs Without Compromising a Costly Assembly**
- **Design of Experiments – – Optimize Parameters**
- **Minimize Mechanical Losses**

HIGH SPEED SEAL/BEARING RIG FUTURE OPPORTUNITIES

- **Upgrade Prime Mover for Other Applications**
- **Higher Air Temperatures Based on Safety**
- **Increase Radial Loads at Lower Speeds**
- **Upgrade to PC–Based Data Acquisition System**
- **WE CAN HELP YOU VALIDATE YOUR DESIGN !**