

# Helicopter Dynamic Components Efforts at Fleet Readiness Center East

## HCAT Meeting

New Orleans, LA

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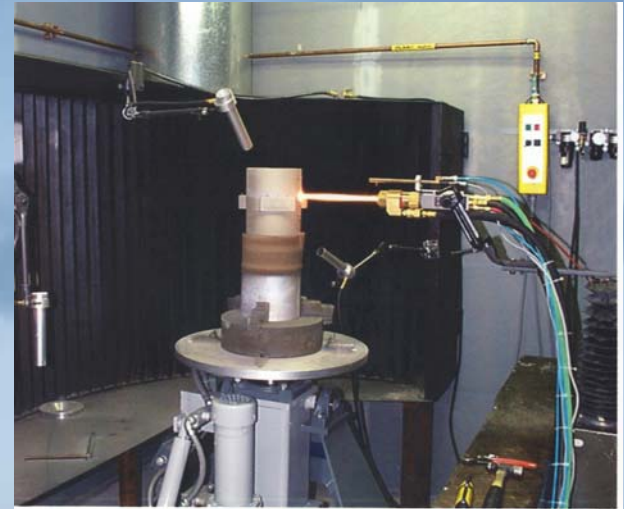
# Current Work at Fleet Readiness Center East

- Funded to prototype repair components by Y0817 Environmental money
- Goals of the project
  - Prototype transmission components
  - Development of overhaul procedures for the components
  - Complete additional coupon testing
- Funding received and work initiated



# Application of HVOF Coating

- Identifying available scrapped components
- Fixtures being developed
- Robotic programming underway
- Coating of three parts complete
- Developing draft process instructions
- Develop tech data sheets for each prototyped component



# Finish Development

- Identifying diamond grinding wheels for finishing
- Discussions to be held with NAVAIR and Boeing on finish requirements
  - 12-20 Ra vs. <10Ra
- May not need to buy new grinding wheels for most components
- Possible training in the future
- Develop tech data sheets for each prototyped component



# H-46 Components

- Input Gear
- Generator Gear
- Utility Pump Drive gear
- Aft input gear
- Aft sun gear
- Planet carrier
- Collector Gear



# Generator Drive Gear

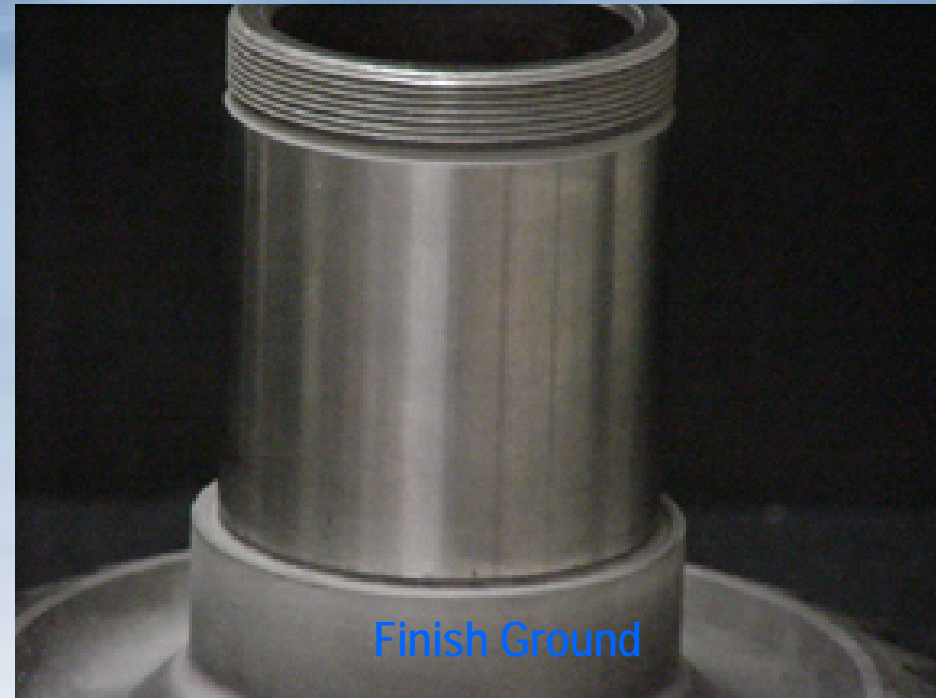
- CH-46 generator gears coated by Southwest Aeroservices
- Applied WC-Co
- Finished to 12-20 RA
- 150 hour endurance test
- No problems observed
- Prototype complete



# H-46 Bevel Gear



As-Sprayed



Finish Ground

# Spiral Bevel Pinion

P/N 423D2215-1



# Aft Sun Gear

**P/N 107D2256-7**

- **Bearing Journals**
- **Wear damage**



# Planet Carrier

P/N A02D2419-4

- **Bearing journal**
- **Wear damage**



# Qualification Testing

- Provide RFI components for test
- Pre-test evaluation
  - Surface finishes verified
  - NDT of components
- 200 hour endurance test
- Post test evaluation
  - NDT of components
  - Measure surface finishes
  - Destructive evaluation of components as required



# 200 Hour Endurance Test

Test	Test Condition	Runtime Hours	Torque in-lb #1 Side	Torque in-lb #2 Side	Engine Shaft RPM
1	101.1% T.E.	120	4586	4561	19,500
2	111..0% T.E.	20	5037	5011	19,500
3	101.6% T.E.	20	4627	4573	21,400
4	134.0% S.E.	2	6065	0	21,400
5	134.8% S.E.	2	0	6101	21,400
6	138.4% S.E.	16	0	6263	19,500
7	134.7% S.E.	16	6098	0	19,500
8	148.4% S.E.	2	6716	0	19,500
9	148.6% S.E.	2	0	6723	19,500



# H-53 Implementation Efforts

- Damper System
  - Implementation underway
  - DCC-88
- Input gear
  - Evaluating HVOF WC-Co to replace plasma sprayed WC-Co



# LECP 3939 DAMPER

## LEAD-THE-FLEET

### Problem:

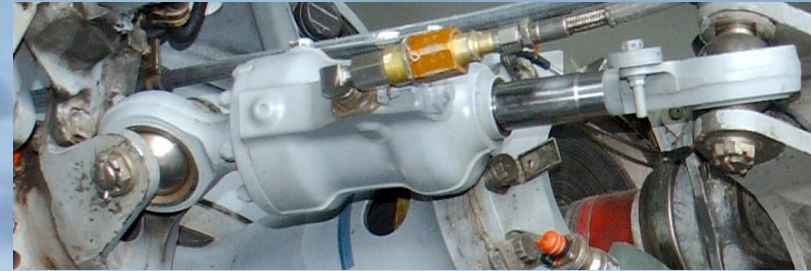
- MRH Damper PN 70106-28000-048 is experiencing reduced damper Time-on-wing (T.O.W.)
- Current MTBR ~ 600 FH.

### Cause:

- Premature dynamic seal failure
- Caused by destructive wear particles from the Beryllium Copper bushing

### Corrective Action:

- LECP 3939 Damper configuration utilizes improved seal designs, new coatings in the housing and a stainless steel bushing coated in Katherm-87.
- Lead-the-Fleet Evaluation of LECP 3939 Dampers began FEB 2004.



## LECP 3939 Main Rotor Dampers, Lead-The-Fleet

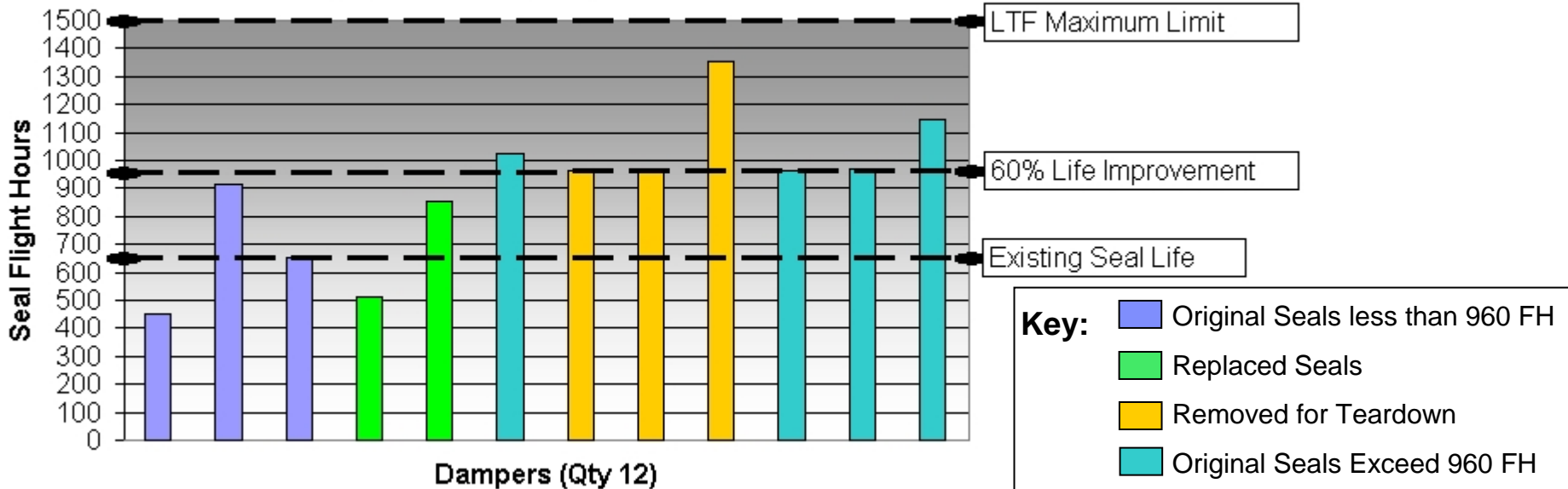
### LTF Status:

- Highest Time Damper (1353.5 hours) removed during maintenance task for convenience. Not failed or leaking. Brought in for teardown at CP.
- Teardown in work, ECD Mid-Feb 2007.
- Remaining dampers will fly to 1500 flight hours or until they fail leakage limits, whichever occurs first.
- Milestones
  - Equivalence to existing -048 Damper: **ACCOMPLISHED**
  - 60% Seal Life Improvement Demonstration: **7 Units Exceed 960 FH to Date**
  - 108.3 Flight hours from accomplishing 60% Life Improvement Milestone.

### SEAL FLIGHT HOURS

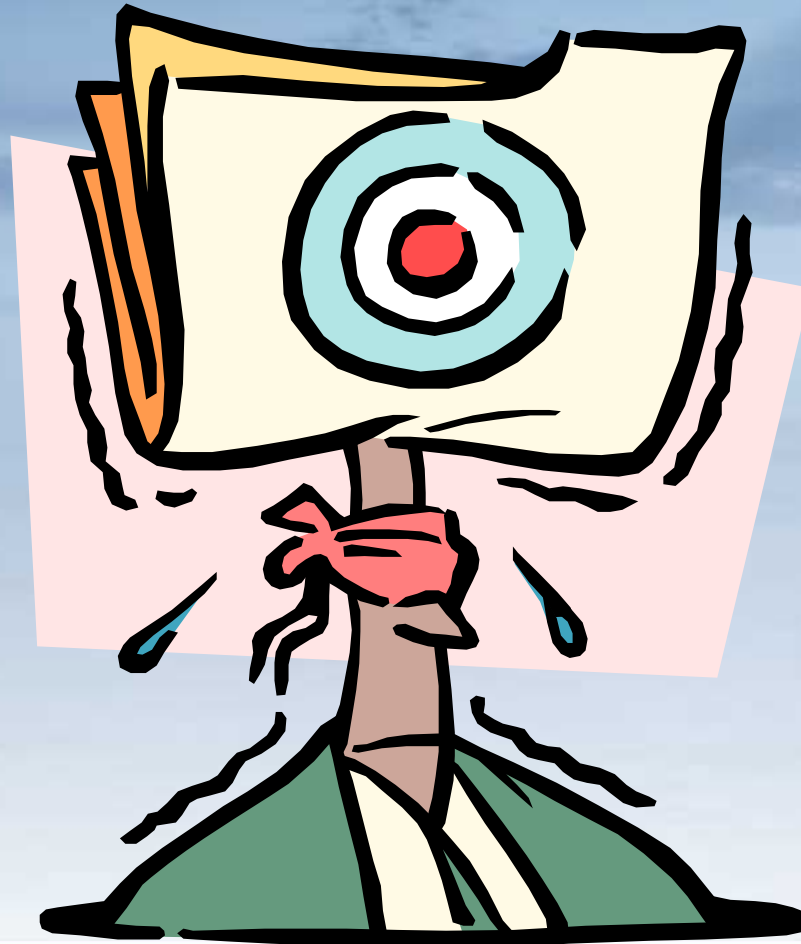
Squadron	LECP3939 Serial Number	Flt Hrs Reported	Date Reported
HSL-60	A221-02572	452.3	1/23/07
HSL-60	A221-00637	915.4	1/23/07
HSL-60	A221-00150	651.4	1/23/07
HSL-60	A221-00100	513.8	1/23/07
HSL-40	A221-01009	851.7	12/31/06
HSL 40	A221-02164	1025.8	12/31/06
Not Installed	A221-01201	965.4	4/20/06
Not Installed	A221-00192	967	4/20/06
Not Installed	A221-02218	1353.5	11/30/06
HSL 41	A221-02814	963.2	9/18/06
HSL 41	A221-00384	970.6	12/4/06
HSL 40	A221-00970	1148.4	12/31/06

### LECP3939 STATUS

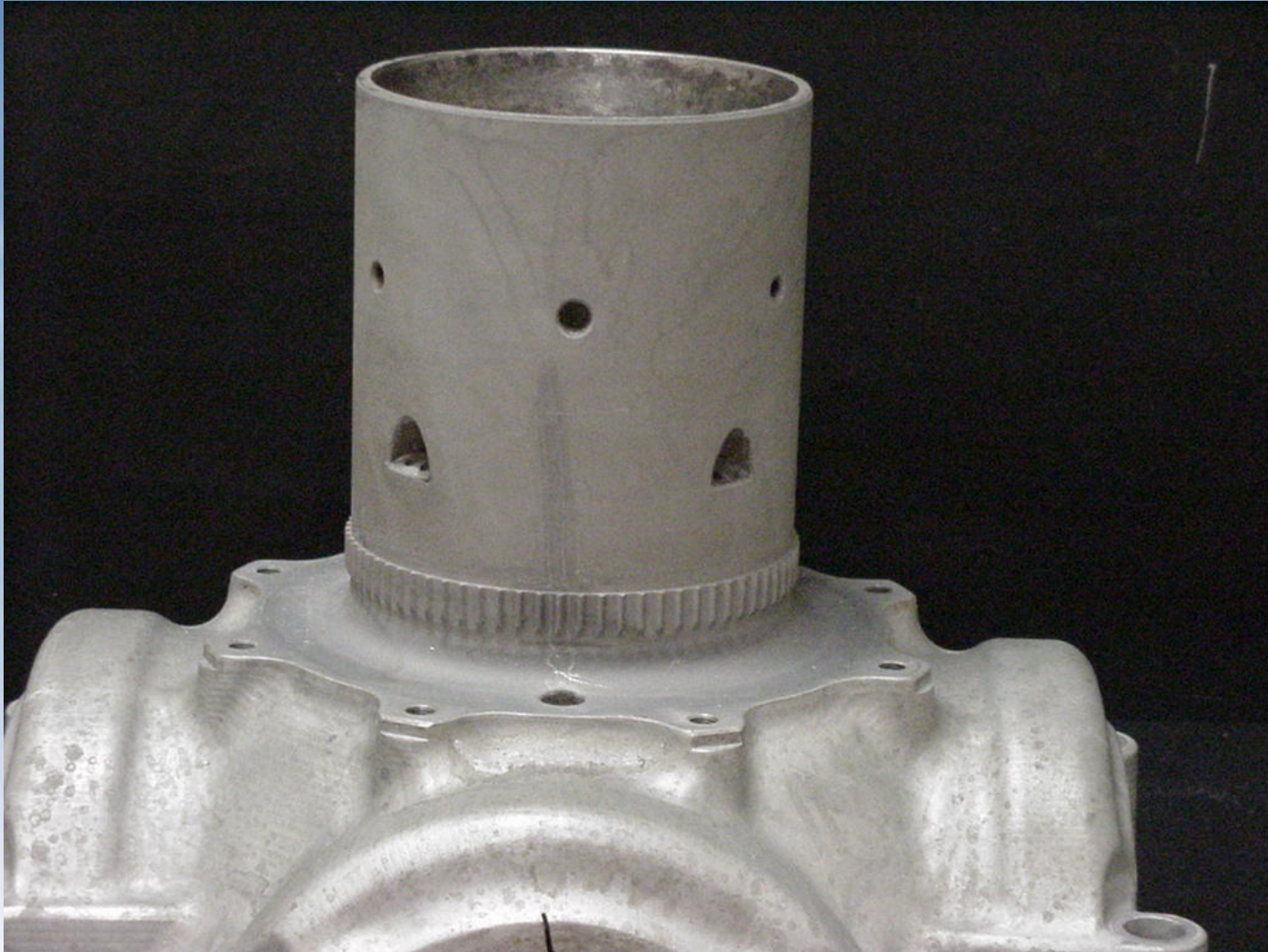


NAV  AIR

# Questions?



# P-3/C-130 Barrel & Pin Assembly



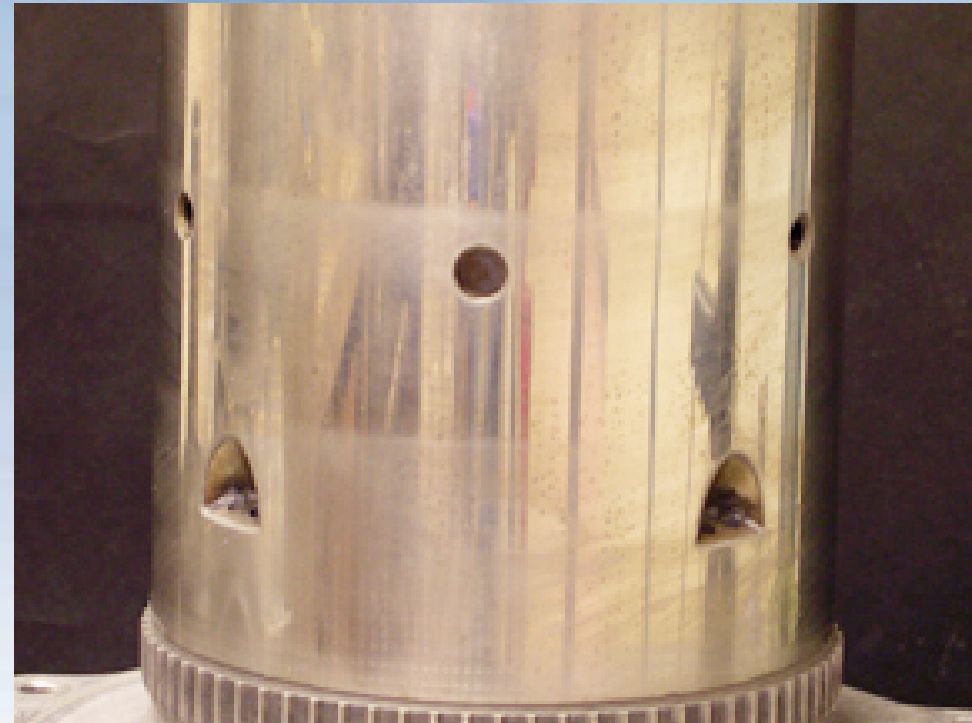
# P-3/C-130 Barrel & Pin Assembly



As-Sprayed



Finish Ground



# P-3/C-130 Lever Support Sleeve

