

Contamination

Consequences of Contamination in Dynamic Operating Systems

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Contamination

- Contamination is a major cost driver
- Army spent \$73 Million in '06; on replacing, overhauling 33 hydraulic system components
- Cost per aircraft over \$30,000

Effect of Contamination

- Unexplained malfunction (Controls)
- Un-commanded input (Output does not match command)
 - Safety risks
 - Accidents
 - Increased operating costs
 - Premature wear of components
 - Waste disposal costs

Effective contamination control

- Improve safety
- Improve mission readiness
- Reduce maintenance costs
- Reduce down time
- Extends Life Cycle
- Improves performance

CH 47 Chinook problem areas

- Leakage
- Pumps
- ILCA (Integrated Lower Control Actuator)
- PSA (Pivoting Swiveling Actuator)

Current status

Flight test with instrumented aircraft to define duty cycle and dynamic operating parameters

- Pressure
- Flow
- Temperature
- Structure borne vibrations

Tests conducted at SSI

- Dynamic Filter Efficiency

 - Current MIL PRF 8815 QPL Filters

 - Improved (Robust) Filters (Army)

- Contamination level variations during the duty cycle

 - Fluid borne vibrations, Resonance

 - Shedding

Benefits of Effective Contamination Control

- Improved safety
- Improved Mission Readiness
- Reduced Maintenance Costs
- Reduced unscheduled down time
- Life Cycle Extension
- Performance Improvements

Army Future Objectives

- Update filter specifications
- Upgrade filters
- Continue technology injection

Optimum time for updating technology

Every five (5) years

Work with the Military

- The Project Offices (PO) and Project Managers (PM) prefer the OEM for improvements and upgrades.
- The services can't handle complex technical issues, or deal with problems.
- The Program Office wants turn-key systems, and complete technical solutions.