

# **Gearbox System Design Course Outline**

## **1. History**

1.1. Types of Gearboxes

## **2. Gearbox Function and Layout**

2.1. Location of gearbox

2.2. Power transmission requirements

2.3. Environmental operating conditions

2.4. Preparation of DETAILED DESIGN LAYOUT

2.4.1. It will serve as a design “Bible”

2.4.2. All changes resulting from design of various components must be coordinated with the layout, and it must be changed accordingly to reflect the changes

2.4.3. Checking of detail drawings shall confirm that they are in agreement with the definitions in the design “Bible”

2.4.4. It must address all applicable gearbox features defined below

## **3. Gearbox Style**

3.1. Open gearbox

3.1.1. Arrangement

3.1.2. Type of gearing

3.1.3. Type of support

3.1.4. Lubrication

3.2. Enclosed gearbox

3.2.1. Arrangement

3.2.2. Type of gearing

## **4. Lubrication**

4.1. Type of Lubricant

4.1.1. Oil

4.1.2. Grease

4.1.3. None

4.1.4. Method of application of lubricant to gear meshes, bearings and shaft seals

4.1.5. Maintaining cleanliness of lubricant

4.1.6. Gearbox breathers

4.1.7. Oil level indicators

4.1.8. Heat exchangers

4.1.9. Operation monitoring instrumentation

4.1.10. Health monitoring and instrumentation

4.1.11. Oil analysis

4.1.12. Vibration sensors, etc.

## **5. Gearbox Housing, Cover and Sump Design**

5.1. Drawings

5.1.1. Separate drawings should be prepared for machining, casting, weldment, etc.

5.1.2. Drawings should always utilize Geometric Dimensioning and Tolerancing (GD&T) system

5.1.3. Detail drawings should indicate the next assembly level for the part

5.2. Gearbox housing, cover and sump

5.2.1. Stress analyses should be performed as soon as definition is established to ensure adequacy of the proposed design and provide ability to make necessary changes, if required

5.2.2. Housing types

5.3. Shaft seals

5.3.1. Lip seals

5.3.2. Packing

5.3.3. Split seals

5.4. Pressure lubrication of gear meshes and bearings

5.4.1. Cast oil passages integral with housing

5.5. Inspection ports

## **6. Gearbox Marking/Identification**

6.1. Nameplates and markings

## **7. Gearbox Accessories**

7.1. Breathers

7.2. Caps

7.3. Vibration monitoring

7.4. Lube sample ports

7.5. Drain ports

## **8. Provisions for Preservation**

8.1. Provisions for shipping

8.2. Crates, packaging, preservation coatings, etc.

*updated as of February 19, 2010*