

August 2010

Executive Summary

Founded in 1920, Pioneer Motor Bearing Company is one of the leading U.S. firms engaged in engineering designs, manufacturing, service and repair of fluid film babbitt (whitemetal) bearings and seals, primarily for the power generation industry. Pioneer offers original equipment manufacturers (OEMs) of large rotating machinery and end- users of fluid film journal and thrust bearings and babbitt seals a full spectrum of capabilities:

- **Manufacturing to the designs of our OEM customers or to Pioneer designs.**
- **Specialized bearing engineering services (design development for OEMs).**
- **Technical services, on site at power plants, serving as bearing specialists, assisting OEM and/or power plant technical personnel.**
- **Repairs, refurbishment and upgrades (standard and emergency).**
- **Bearing damage mechanism analysis.**
- **Bearing engineering "trouble-shooting" (solving operational problems, such as over heating, etc.).**

For more than 40 years our principal customers have been North American OEMs and end- users in the electric utility industry's three primary sectors: fossil, hydro and nuclear. In just the past four years alone, we have manufactured and repaired over 1,500 large steam, gas and hydroelectric turbine and generator radial and thrust bearings, as well as bearings for the industrial power generation market and many smaller bearings for related equipment at power plants. We manufacture for OEMs and repair for OEMs and end- users.

Our primary heritage is manufacturing new radial and thrust bearings and seals for OEMs both to our customers' designs and those of our own. Yet Pioneer operates the longest continuing independent bearing repair service in the U.S., dating back to 1920.

ALSTOM Since 1990, Pioneer has supplied new Alstom-designed bearings to Alstom Power Service (Midlothian, Virginia, U.S.), often on short lead times to meet the requirements of power plant outage schedules. In addition, since 1993 Pioneer has been the exclusive bearing repair licensee of Alstom Power in the U.S. (and its antecedent, ABB Power Generation, Inc.). Pioneer is very familiar with Alstom bearing designs, material specifications and quality assurance requirements.

The foundation of our growth consists of: (1) a good reputation and history as a supplier to some major OEMs in the U.S. and the U.S. Navy; (2) competitive labor costs at our manufacturing plant near Charlotte, North Carolina; and (3) a thorough understanding of bearing design theory and operation, complimented by almost nine decades of bearing manufacturing and repair experience under the same stable family ownership. Our objective is to provide OEMs and end users with the optimum solutions to their bearing requirements, whether they be merely repairing or manufacturing bearings on a just-in- time basis to meet equipment overhaul time frames, or the more demanding

work of offering value engineering design suggestions to enhance the performance of existing bearings in older machinery.

The scope of our engineering, manufacturing and repair capabilities and experience includes vertical guide journal and tilting pad thrust bearing assemblies and runners commonly found in large hydroelectric power generation plants. We design and build thrust bearing assemblies, including their runners, that support loads in excess of 2,000,000 pounds.

Michell Bearings

A Member of the Rolls-Royce Group

On February 15, 2005, Michell Bearings of Newcastle, U.K. (a member of the Rolls-Royce Group), and Pioneer Motor Bearing Company entered into a comprehensive alliance. Michell and Pioneer share their respective technologies, engineering services and associated technical support under cross trade secret license agreements. Thus, in addition to our own capabilities, Pioneer's engineers can draw on the unmatched engineering experience and talent of Michell Bearings. Michell Bearings, founded in 1920, is acknowledged as a premier supplier of self-contained babbitt (whitemetal) and polytetrafluoroethylene-faced ("PTFE"), oil lubricated, hydrodynamic thrust and journal bearings for large hydroelectric vertical turbine-generators and a wide range of marine and industrial applications worldwide. Mr. A.G. Michell was awarded the first patent issued in the world for a tilting pad hydrodynamic bearing, in 1905.

SIEMENS Pioneer has been a qualified supplier to Siemens Power Generation in the U.S. (and its antecedent, the Power Generation Business Unit of Westinghouse Electric Corporation) since 1974. In fact, from 1989 to 1995, Pioneer was the exclusive supplier to Westinghouse of all new Westinghouse-designed babbitted bearings. Pioneer was the first and still is the senior bearing repair licensee of Siemens Power Generation (since 1983). Our relationship as a qualified supplier to both Westinghouse Electric and General Electric marine divisions began in 1956.

Pioneer's specialized bearing engineering services to electric utilities include:

- **Root cause bearing damage analysis;**
- **Design of modifications to the geometry or other features of existing bearings to improve their performance;**
- **Design and manufacture of new bearings to improve the operation of virtually any rotating equipment;**
- **Rotor dynamics evaluations;**
- **Training of operations and maintenance personnel, using a syllabus created by Pioneer to help identify a variety of bearing damage mechanisms.**

We have the expertise to use a variety of sophisticated analytical tools, including **GENMAT™**. Among many of its capabilities is its unique ability to perform a thorough computer analysis of **spring bed-supported thrust bearings**. Developed over two decades by Emeritus Professor Chris Ettles, GENMAT enables us to offer you the less expensive option to salvage, upgrade and benefit from the inherent advantages of spring bed and other designs.

Overseas, in 1996 Pioneer became a qualified supplier to the Korean Electric Power Co. (KEPCO) and has sold manufacturing, repair and engineering services to KEPCO, including technical services at KEPCO's Kori Nuclear Power Plant and training in rotordynamics to KEPCO engineers at our

manufacturing plant in North Carolina. In addition, Pioneer has sold engineering and technical services (on site) to:

- **Vattenfall AB, Ringhals Nuclear Power Station, Väröbacka, Sweden;**
- **EletroNuclear, Angra-2 Unit, near Rio de Janeiro, Brazil.**

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