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An American National Standard

Standard Guide for Cleaning, Flushing, and Purification of Steam, Gas, and Hydroelectric Turbine Lubrication Systems[1]

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INTRODUCTION

Optimum turbine system reliability requires a well designed lubricating system and use of a good lubricant that is free of contaminants. Achieving this requires use of proper purification methods to ensure that the oil is free of detrimental contaminants. In addition, it requires an ongoing monitoring program to ensure that the oil quality is within specifications and that corrective action is taken to minimize contaminant generation and ingression. The benefits of purification of an operating lubrication system can be significantly reduced if the lubricating systems are not initially cleaned to a level that will prevent component damage on initial start up after manufacturing or rebuilding.

Care and thorough cleaning are required to minimize and remove contaminants during fabrication, rebuilding, or installation, or combination thereof. Because contaminants will remain from these processes, it is necessary to flush and purify the system to remove them prior to startup. Ongoing purification is required to maintain pure oil during operation. In new systems, the emphasis is on the removal of contaminants introduced during manufacture, storage, field fabrication, and installation. In operational systems, the emphasis is on the removal of contaminants that are generated during operation and by malfunctions that occur during operation or contaminants that are introduced during overhaul, or both.

1. Scope

1.1 To obtain maximum operating reliability and component life, it is vital that the turbine lubrication system has pure oil. This guide is intended to aid the equipment manufacturer, installer, and turbine operator in coordinating their efforts to obtain and maintain clean lubrication and control systems. These systems may be on land or marine turbine generators and propulsion and mechanical drive equipment. This guide is generalized due to variations in the type of equipment, builder's practices, and operating conditions.

1.2 This guide covers types of contaminants, oil purification devices, contamination monitoring, contamination control during building or refurbishing of turbine systems, lubrication system flushing, and maintenance of pure lubrication oil.

1.3 This guide primarily addresses petroleum based lubricating oil. For systems using nonpetroleum based fluids, this guide may not be appropriate. For nonpetroleum products, consult the equipment and fluid manufacturers.

1.4 This guide is applicable to both large and small lubrication systems. Some equipment specified herein, however, may not be appropriate for all systems. Moreover, in situations where specific guidelines and procedures are provided by the equipment manufacturer, such procedures should take precedence over the recommendations of this guide.

1.5 *This standard does not purport to address the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 95 Test Method for Water in Petroleum Products and Bituminous Materials by Distillation[2]

D 445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (the Calculation of Dynamic Viscosity)[2]

D 664 Test Method for Acid Number of Petroleum Products by Potentiometric Titration[2]

D 974 Test Method for Acid and Base Number by Color-Indicator Titration[2]

D 1533 Test Methods for Water in Insulating Liquids (Karl

[1] This test method is under the jurisdiction of ASTM Committee D-2 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.0C.01 on Turbine Oil Systems.

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[2] *Annual Book of ASTM Standards*, Vol 05.01.

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