

Hydraulic Institute Program Guideline for

Pump System Certification



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Hydraulic Institute Program Guideline

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Building A, Third Floor
Parsippany, NJ 07054-4406**

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Foreword

Purpose and Aims of the Hydraulic Institute

The purpose and aims of the Hydraulic Institute are to drive all Pump System stakeholders towards a sustainable future by:

- a) Advancing Solutions for Pump System Performance and Efficiency
- b) Developing Standards and Technical Resources
- c) Educating the Global Marketplace
- d) Advocating for the Industry

Purpose of Document:

Hydraulic Institute Standards, Guidelines, Specifications, Program Guidelines, and Papers are adopted in the public interest and are designed to help eliminate misunderstandings between the manufacturer, the purchaser, and/or the user and to assist the purchaser in selecting and obtaining the proper product for a particular need. Use is completely voluntary and does not in any respect preclude a member from manufacturing or selling products which are not conforming.

Definition of Documents:

Hydraulic Institute Standard

Quoting from Article XV, Standards, of the By-Laws of the Institute, Section B:

“An Institute Standard defines the product, material, process or procedure with reference to one or more of the following: nomenclature, composition, construction, dimensions, tolerances, safety, operating characteristics, performance, quality, rating, testing and service for which designed.”

Hydraulic Institute Guideline

A Hydraulic Institute Guideline is not normative. The guideline is tutorial in nature, to help the reader better understand the subject matter.

Hydraulic Institute Program Guideline

A Hydraulic Institute Program Guideline outlines a normative process that must be followed to participate in the Program.

Hydraulic Institute Specification

A Hydraulic Institute Specification precisely and clearly states requirements that are suitable for incorporating into contract terms. In addition to the stated requirements, it may state options, and provide external references, notes to the specifier, datasheets, or other useful content. All content that is optional or is not a stated requirement shall not conflict with the stated requirements.

Hydraulic Institute White Paper

A Hydraulic Institute White Paper defines a product, material, process or procedure with reference to one or more of the following: nomenclature, composition, construction, tolerances, operating characteristics, applications, performance, quality, rating, acceptability criteria, testing and service for which designed.

Hydraulic Institute Body of Knowledge

A Hydraulic Institute Body of Knowledge defines training or knowledge requirements for the pump industry, which can be used by entities interested in developing training or certification for industry professionals.

Comments from Users

Comments from users of this standard will be appreciated, to help the Hydraulic Institute prepare even more useful future editions. Questions arising from the content of this standard may be directed to the Technical Director of the Hydraulic Institute. If appropriate, the inquiry will then be directed to the appropriate technical committee for provision of a suitable answer.

Revisions

Hydraulic Institute publications are subject to constant review, and revisions are undertaken whenever it is found necessary because of new developments and progress in the art. Errata or addenda may be issued to address limited changes.

Disclaimer

This document was prepared by the Hydraulic Institute. Neither the Hydraulic Institute, Hydraulic Institute committees, nor any person acting on behalf of the Hydraulic Institute: 1) makes any warranty, expressed or implied, with respect to the use of any information, apparatus, method, or process disclosed in this document or guarantees that such may not infringe privately owned rights; 2) assumes any liabilities with respect to the use of, or for damages resulting from the use of, any information, apparatus, method, or process disclosed in this guideline. The Hydraulic Institute is in no way responsible for any consequences to an owner, operator, user, or anyone else resulting from reference to the content of this document, its application, or use.

This document does not contain a complete statement of all requirements, analyses, and procedures necessary to ensure safe or appropriate selection, installation, testing, inspection, and operation of any pump or associated products. Each application, service, and selection is unique with process requirements that shall be determined by the owner, operator, or its designated representative.

Units of Measurement

Metric units of measurement are used, and corresponding US customary units appear in parentheses. Charts, graphs, and sample calculations are also shown in both metric and US customary units. Because values given in metric units are not exact equivalents to values given in US customary units, it is important that the selected units of measure to be applied be stated in reference to this standard. If no such statement is provided, metric units shall govern.

Committee List

A working committee met many times to facilitate its development. At the time it was developed, the committee had the following members:

Chair – Tammy Moskal, Xylem Inc.

Committee Members

Jim Aubrey
Julie Ballard
Ricardo Esbri
Charles Falzone
Kenric Freiwald
Carl Frizzell
Keith Schindler
Brooke Stonecypher
Kelly Tappa
A. Bruce Ticknor III
Scott Tystad
Billy Werner

Company

Hydro, Inc.
KSB, Inc.
U.S. Army Corps of Engineers
Industry Partner
National Pump Company
CDM Smith
Flowserve Corporation
Patterson Pump Company
ABB Motion
Industry Partner
Pentair
Motiva Enterprises LLC

Committee Alternates

Trush Bhatt
Eric Hammock
Markus Holmberg
Sheila Mitchell
Jeff Newton

Company

Xylem, Inc.
Xylem, Inc.
Xylem, Inc.
Flowserve Corporation
Pentair

41.8 Program Guideline for the Pump System Certification

41.8.1 Introduction

41.8.1.1 Scope

This program guideline establishes the formal credentialing requirements for a Pump System Certified (PSC) Level 1 and Level 2 certification, including a standardized examination and renewal process. Certification shall be based on the HI 40.9 Pump Industry Fundamentals Body of Knowledge, which outlines the knowledge areas for pump industry professionals.

41.8.1.2 Purpose

This program guideline provides the requirements and qualifications for certifying a person to be PSC. The certification provides third-party validation by the Hydraulic Institute (HI) that individuals have the knowledge, training, and experience necessary to understand and apply the general pump system fundamental knowledge as set forth in HI 40.9 Pump Industry Fundamentals Body of Knowledge. A PSC may be employed as, but is not limited to:

- Application Engineer
- Assembly Technician
- CAD Drafter
- Design and Development Engineer
- Distributor / Stocking Partner
- Energy Efficiency Engineer
- Field Service Technician
- Improvement Engineer
- Maintenance Technician
- Manufacturer Representative
- Manufacturing Plant Engineer
- Plant Manager or Operator
- Process Engineer
- Product Manager
- Pump Engineer
- Reliability Engineer
- Sales Manager
- Specifying Engineer
- System Design Engineer
- Test Engineer

For a description of these job titles, refer to HI 40.9 Pump Industry Fundamentals Body of Knowledge and the HI website at www.pumps.org.

41.8.1.3 Benefits of the PSC Certification Program

The benefit is a standardized training method on the fundamentals of the pumping and fluid handling industry to help fill the gap created by experienced professionals retiring from the workforce and difficulty in attracting young professionals into industrial professions. When a new employee is hired, companies have the critical task of educating and training them on the company's processes, products, or services they deliver. However, before starting on this, the fundamentals must be known, which this certification program will support.

41.8.1.4 Definitions and Nomenclature

Participant – any individual who participates in the certification or recertification process.

Body of Knowledge – the core knowledge and skills required to work within the pump industry.

Certification Committee – a committee that meets periodically to review the health of the program, suggest improvements, and performs tasks as necessary to maintain the program.

Applicant – an individual who applies for certification.

Program Manager – an HI staff member responsible for managing the maintenance of the program and the certification process.

Candidate – an individual who has met the eligibility requirements for certification.

Certified Individuals – an individual who has met all the certification requirements and has earned the credential.

Professional Development Units – a form of continuing education credits that are awarded for experience, training, presentations, published papers and other approved and demonstrated proficiency efforts.

Proctor – an HI appointed individual or organization who monitors Candidates during the administration of the certification exam.

Level 1 – a new or entry level that indicates an individual understands the purpose, function, and operating characteristics of positive displacement and rotodynamic pumps and systems.

Level 2 – an experienced level that indicates an individual has applied knowledge of the purpose, function, and operating characteristics of positive displacement and rotodynamic pumps and systems.

41.8.1.5 Program Overview

Participants who achieve a passing score on the certification exam and complete all other program requirements will earn the PSC credential. HI makes the final approval determination and can suspend approval as discussed in this document. As a part of the program, HI maintains an online list of certified professionals on the HI website.

Day-to-day management of the program, including final approval as well as denials and suspensions, is the responsibility of the Program Manager. The Program Manager will report to the PSC Certification Committee. In the case of a dispute a Participant has about non-approval, the Program Manager will review the dispute with the Certification Committee. If the dispute cannot be resolved, an appeal can be made by the Participant to the Certification Committee. The HI Certification Programs Steering Committee will be at the highest level of appeal.

41.8.2 Certification Levels

There are two levels of PSC certification based on education and experience, PSC Level 1 and PSC Level 2. The PSC Level 1 certification is for new or entry level technical and non-technical persons that is applicable to all job functions within the pump industry. The PSC Level 2 is for experienced technical and non-technical individuals with job functions in sales, assembly, engineering, installation, maintenance, troubleshooting, or operations.

41.8.2.1 Pump System Certified - Level 1

A PSC Level 1 certification indicates that an individual understands the purpose, function, and operating characteristics of positive displacement and rotodynamic pumps and systems. Level 1 certified individuals should have the fundamental knowledge of basic pump industry calculations and tools, different liquid properties and be able to analyze their interactions with equipment and a system to make informed pump hydraulic selections. The candidate should be able to collaborate with professionals to identify equipment type, acceptable pump performance, installation and operational issues, and energy optimization opportunities.

These competencies include, but are not limited to:

- In-depth knowledge of pump curves, system curves, and their interaction.
- Identifying all types of pumps along with the extended pump product.
- Understanding the basic operating theory of both rotodynamic and positive displacement pumps.
- Recognizing major pump components, terminology, and understanding their purpose.
- Performing basic pump industry calculations, such as power calculations and annual energy consumption.
- Understanding different fluid properties.
- Describing and applying basic concepts of variable speed pumping and control.
- Understanding the causes of common operating problems.
- Understanding basic installation, maintenance, and operation principles.
- Determining typical application considerations.
- Basic understanding of vibration analysis.
- Understanding pump curves as a tool to troubleshoot pump performance issues.

Refer to Appendix A for a complete list of topics contained in the PSC Level 1 Body of Knowledge.

Examples of persons this certification applies to include, but are not limited to:

- College students with an interest in the pump industry.
- Engineers new to the pump industry or interested in the pump industry.
- Sales, marketing, and applications employees new to the pump industry.
- Technicians interested in the pump industry.