



**HYDRAULIC INSTITUTE
PUMP TEST LABORATORY PROGRAM
TEST FACILITY AUDIT CHECKLIST**

NOTE: All Pump Test Laboratory data provided to Intertek/Hi is for the sole purpose of pump test laboratory approval and is corporate proprietary information. This data is not shared or released to any third party without written consent from the Participant. The Auditor's use of information obtained during the audit is limited to determination of confirmation of the HI 40.7 Program Guide and will be treated confidentially.



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Required Documents for Audit

The below should be supplied to Intertek in accordance with HI 40.7 after the application has been completed, approved, and after the initial discussion with Intertek has taken a place.

- Pump Test Laboratory Quality Manual(s) (electronic copy/PDF)**
- Company/ Laboratory Personnel/Organizational Chart**
- Pump Test Laboratory Quality Management Documentation**
- Copy of Standard [HI 40.6 Methods for Rotodynamic Pump Efficiency Testing]**
- Spreadsheet of instrumentation used for pump testing (equipment list)**
- Full contact information for calibration company(s)**
- Electronic copy of calibration certifications (electronic copy/PDF)**
- Type(s)/size(s) of pump(s) to be tested under HI 40.6**
- Diagrams of pump test arrangements as used for Standard HI 40.6.**
- Training Documentation and Records**



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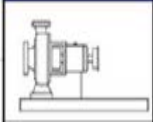




Section 1: Basic Requirements

Auditing Details

1.1 Type of Audit	
Initial Audit <input type="checkbox"/> Date _____	Annual Audit <input type="checkbox"/> Date _____
Scope Extension <input type="checkbox"/> Date _____	Follow- Up Audit <input type="checkbox"/> Date _____
Re-location Audit <input type="checkbox"/> Date _____	Re-Audit <input type="checkbox"/> Date _____
1.2 Manufacturing Test Lab Contact Information/ Auditing Team	
GENERAL INFORMATION	
Date(s) of the Audit:	
Hydraulic Institute Program Manager:	
Intertek Auditor(s):	
TESTING SITE/ LAB	
Test Lab Name:	
HI Registration #:	
Address of Lab:	
Lab Contact:	
Direct Telephone #:	Email:
PARTICIPANT INFORMATION (could be the same as Testing Site/Lab)	
Company Name:	
Company Address:	
Contact:	
Main Telephone Number:	
1.3 Previous HI 40.7 Audit Reports (reference Intertek report number and date or N/A)	

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1.4 Pump Test Laboratory Pump Types covered by this Audit

	European Nomenclature	DOE Nomenclature	ANSI/HI Nomenclature	Description	Check Applicable Pump Types
	ESOB	ESFM	OHO	Flexibly Coupled Horizontal, Frame Mounted Centrifugal	<input type="checkbox"/>
			OH1	Flexibly Coupled Horizontal, Foot Mounted Centrifugal	<input type="checkbox"/>
	ESCC	ESCC	OH7	Close Coupled Single Stage, End Suction	<input type="checkbox"/>
	ESCCI	IL	OH3	Flexibly Coupled Vertical, In-Line Centrifugal	<input type="checkbox"/>
			OH4	Rigidly Coupled Vertical, In-Line Centrifugal	<input type="checkbox"/>
	No Eqv.	IL	OH5	Close Coupled Vertical, In-Line Centrifugal	<input type="checkbox"/>
	MS	RS-V	VS8	In-line casing diffuser	<input type="checkbox"/>
	MSS	VT-S	VSO	Close Coupled, Submersible Diffuser Centrifugal 4" or 6" Bowl Diameter only	<input type="checkbox"/>



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1.5 Pump Details (Section 40.7.3.7.4 of HI 40.7-2014)		
	Pump # 1	Pump #2
Manufacturer Name		
Type		
Model #		
Serial #		
Size		
Stages		

Section 2: Agenda / Personnel Auditing

2.1 Opening Meeting (Section 40.7.3.7.1 of HI 40.7.2014)	
<input type="checkbox"/> Agenda reviewed	
2.2 Employees	
Number of people working in the lab testing area	
Number of people involved with the product testing activity of the test facility within scope of the audit	

2.3 Staff Interviews (Section 40.7.3.7.2 of HI 40.7-2014)		
	Yes	No
Pump test laboratory personnel competent to qualifications and training requirements	<input type="checkbox"/>	<input type="checkbox"/>
Additional contracted test laboratory personnel supervised and competent on the work in accordance with pump test labs management system	<input type="checkbox"/>	<input type="checkbox"/>
Procedure in place to identify training needs / training provided for employees	<input type="checkbox"/>	<input type="checkbox"/>
Current applicable job descriptions maintained	<input type="checkbox"/>	<input type="checkbox"/>



2.4 Personnel Structure (Managers responsible for Testing Lab)						
Name	Title	Years of Relative Experience	Experience		Appropriate Experience	
			Yes	No	Yes	No
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4 Personnel Structure (continued) (Staff involved in testing)						
Name	Title	Years of Relative Experience	Experience		Appropriate Experience	
			Yes	No	Yes	No
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4 Personnel Structure (continued) (Staff involved in Quality Management System and Calibration activities)						
Name	Title	Years of Relative Experience	Experience		Appropriate Experience	
			Yes	No	Yes	No
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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2.5 Auditing of the Manufacturing Test Labs staff's competence		
	Yes	No
Demonstration of ability to safely perform all job functions	<input type="checkbox"/>	<input type="checkbox"/>
Ability to gather data from required equipment per requirements of applicable standard	<input type="checkbox"/>	<input type="checkbox"/>
Ability to read and interpret graphs and charts	<input type="checkbox"/>	<input type="checkbox"/>
Ability to analyze pump test results and produce pump test reports	<input type="checkbox"/>	<input type="checkbox"/>
Understand each applicable test standard for which the pump test laboratory is approved	<input type="checkbox"/>	<input type="checkbox"/>
2.6 Organizational Structure		
Please provide a copy of the current organizational copy as it applies to this program		

Technical Requirements

Section 3: Review of Technical Documents

3.1 Records Review (Section 40.7.3.7.3 of HI 40.7-2014)			
	Yes	No	Reviewed Evidence:
Pump Test Laboratory Records managed in accordance with HI 40.6-2014 Methods for Rotodynamic Pump Efficiency Testing	<input type="checkbox"/>	<input type="checkbox"/>	
All Performance tests and gauge records are traceable and clearly identifiable	<input type="checkbox"/>	<input type="checkbox"/>	
3.2 Demonstrations of pump testing procedure (Section 40.7.3.7.4 of HI 40.7-2014)			
			Reviewed Evidence:
Witness of (1) Pump test to determine compliance to section 40.7.3.7.4 of HI 40.7.	<input type="checkbox"/>		
If applicable (2 nd) Pump test to determine compliance to section 40.7.3.7.4 of HI 40.7.	<input type="checkbox"/>		



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Section 4: Pump Test Equipment

4.1 Instrumentation Calibration (Section 40.7.4.3.2 of HI 40.7-2014)			
	Yes	No	
A Calibration label is affixed to each calibrated instrument	<input type="checkbox"/>	<input type="checkbox"/>	
Calibration label has an equipment identification number or tag	<input type="checkbox"/>	<input type="checkbox"/>	
Calibration label has due date of next calibration	<input type="checkbox"/>	<input type="checkbox"/>	
Are any pieces of equipment out of calibration?			
	<input type="checkbox"/>	<input type="checkbox"/>	
If yes is indicated please provide details.			
4.2 Maintenance (Section 40.7.4.4 of HI 40.7-2014)			
	Yes	No	Reviewed Evidence:
A documented maintenance program in place to keep pump test equipment, instrumentation, and data acquisition system in working conditions	<input type="checkbox"/>	<input type="checkbox"/>	
Back up or overlap instrumentation available for out of service, or out of calibration equipment.	<input type="checkbox"/>	<input type="checkbox"/>	
Instruments that are overloaded, mishandled, give questionable results, or have been shown to be defective or outside specified limits are taken out of service.	<input type="checkbox"/>	<input type="checkbox"/>	

Section 5: Concepts of Measurement

5.1 Measurements and reporting of data (Section 40.7.4.5 of HI 40.7-2014)			
	Yes	No	Reviewed Evidence
Laboratory test measurements are accurately recorded	<input type="checkbox"/>	<input type="checkbox"/>	
Are the environmental conditions accurately recorded?	<input type="checkbox"/>	<input type="checkbox"/>	
Safeguards in place to ensure no adjustments can be made to invalidate the pump tests / and / or calibration results	<input type="checkbox"/>	<input type="checkbox"/>	



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If noncompliances are indicated please provide details.

5.2 Procedure for application of Measurement Uncertainty

	Yes	No	Reviewed Evidence:
Does Test Laboratory have a documented operating procedure in place for application of measurement uncertainty?	<input type="checkbox"/>	<input type="checkbox"/>	
Document Number:	Document Title:		

5.3 Test Laboratory Competence in Measurement Uncertainty concepts

	Yes	No	Reviewed Evidence:
Does all the laboratory staff have knowledge of the basic concepts of uncertainty of measurement?	<input type="checkbox"/>	<input type="checkbox"/>	
Can the laboratory staff select instrumentation and make pass/fail decisions taking measurement uncertainty into account?	<input type="checkbox"/>	<input type="checkbox"/>	
Are selected laboratory staff sufficiently expert in uncertainty of measurement to calculate measurement uncertainties associated with test equipment and testing performed?	<input type="checkbox"/>	<input type="checkbox"/>	

Name of persons(s):

Were the training records of the select laboratory staff checked?	<input type="checkbox"/>	<input type="checkbox"/>	
Were examples of uncertainty of measurement calculations for actual tests performed in the laboratory by the select laboratory staff reviewed and found to be acceptable?	<input type="checkbox"/>	<input type="checkbox"/>	

5.4 Measurement Uncertainty (Section 40.7.4.5.1 of HI 40.7-2014)

Reviewed Evidence:	Yes	No
Verify calibration certificates and include measurement uncertainty values.	<input type="checkbox"/>	<input type="checkbox"/>

5.5 Data Analysis and Report Generation (Section 40.7.4.5.2 of HI 40.7-2014)



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Reporting of Results	Yes	No	Reviewed Evidence:
Does the test data contain the minimum requirements outlined in Appendix B?	<input type="checkbox"/>	<input type="checkbox"/>	

Section 6: Measurement of Pump Power Input

6.1 Electrical Power Distribution System for Testing			
	Yes	No	Reviewed Evidence:
Is the electrical power distribution system appropriate for the scope of recognition according to Appendix C Section 4? (HI 40.6)	<input type="checkbox"/>	<input type="checkbox"/>	
6.2 Electrical Pump Power Input			
<p>Pump power input shall be determined by dynamometers, torque meters, calibrated motors, wattmeters, or other devices that can be demonstrated to meet the uncertainty requirements of Section 40.6.3.2.3 of the Standard.</p> <p>When a calibrated motor is used to determine the pump input power, the voltage and the frequency shall be same as used during the calibration of the motor with the allowable tolerance per below:</p> <p><input type="checkbox"/> Voltage stability: +/- 5 percent maximum</p> <p><input type="checkbox"/> Frequency stability: +/- 1 percent maximum</p>			
<p>Comments about the laboratory's power distribution system including its capability and stability for testing equipment within the scope of this audit.</p>			
6.3 Electrical Power Supply Monitoring			
	Yes	No	
The laboratory/facilities has/have an operating procedure to monitor, control and record characteristics of the laboratory/facilities power supplies used for testing to ensure continued conformance with the requirements.	<input type="checkbox"/>	<input type="checkbox"/>	
Document Number:	Document Title:		



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The laboratory's/facilities' operating procedure requires the laboratory power supply characteristics to be checked upon initial installation, modification and repair, and periodically thereafter	<input type="checkbox"/>	<input type="checkbox"/>
The laboratory's/facilities' operating procedures require monitoring of critical characteristics specified by the test standard (e.g. voltage) throughout the performance of the test.	<input type="checkbox"/>	<input type="checkbox"/>

Section 7: Quality Management System

7.1 Quality Documentation			
What is the Accreditation body for this test lab? (if available, attached the Accreditation Certificate)			
	Yes	No	N/A
Does the accreditation cover the products/standards covered by this audit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7.2 Quality Management Chart	
Please attach any supporting documents for the Quality Management System.	



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Audit Acknowledgement

Signatures of the Auditor(s)		
Date: mm-dd-yyyy		
Auditor #1	Auditor #2	Auditor #3
Signature	Signature	Signature
Printed Name	Printed Name	Printed Name
Acknowledgement by the Auditor and Customer		
<input type="checkbox"/> I acknowledge and agree with the content of the Audit Report.	<input type="checkbox"/> I acknowledge and agree with the content of the Audit Report. <input type="checkbox"/> I acknowledge the content of the Audit Report and we disagree for the following reasons:	
Auditor Representative	Manufacturer/ Customer Representative	
Signature	Signature	
Printed Name and Title	Printed Name and Title	



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Annex 2

Non-Conformity Report

Non Conformity Report # assigned:		Date:
Name of the Audited Lab:		
<i>Category(ies) concerned:</i>	<i>Clause/Sub-clause of Non-conformity:</i>	
	related to the relevant reference standards, procedures or product standard	
Non-conformity(ies) description:		
Auditor Representative	Manufacturer/ Customer Representative	
Signature	Signature	
Printed Name and Title	Printed Name and Title	



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Annex 2(continued)

Non-Conformity Report

Non Conformity Report # assigned:	Date:
Name of the Audited Lab:	
Root Cause of Non-conformity:	
Proposed Corrective action(s):	
Implementation Date:	
Auditor Representative	
Signature	
Printed Name/ Date	



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Non-Conformity Report

Non Conformity Report # assigned:		Date:
Name of the Audited Lab:		
Proposed Corrective Action(s) acceptance:		
<input type="checkbox"/> Acceptance, no further verification required.		
<input type="checkbox"/> Acceptance, further verification of implementation is required.	<input type="checkbox"/> With on-site follow-up Audit	
	<input type="checkbox"/> Without on-site Audit	
Implementation Verified and Final Clearance provided by Auditor Representative		
Auditor Representative		
Signature		
Printed Name/ Date		