GREAT LAKES CHEMICAL PROCESSING

Hamilton Plant

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Title:	Site-Specific NDE Requirements
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Owner:	Inspection Department
Approved By:	R. Hendricks, Unit Engineer

1. PURPOSE AND SCOPE

This document establishes the site-specific requirements for Non-Destructive Examination (NDE) activities performed at the Great Lakes Chemical Processing Hamilton Plant. These requirements supplement and, where specified, supersede the requirements of referenced codes and standards. All NDE contractors performing work at this facility shall comply with the requirements herein.

1.1 Applicability

This specification applies to all NDE activities including but not limited to: ultrasonic thickness measurement (UT), magnetic particle testing (MT), liquid penetrant testing (PT), visual inspection (VT), and radiographic testing (RT) performed on pressure-containing equipment and piping systems.

2. REFERENCE DOCUMENTS

Code/Standard	Title
API 570	Piping Inspection Code
API 574	Inspection Practices for Piping System Components
API 510	Pressure Vessel Inspection Code
ASME B31.3	Process Piping
ASME Section V	Nondestructive Examination
ASNT SNT-TC-1A	Personnel Qualification and Certification in NDT
GLCP-SAFE-001	Contractor Safety Requirements
GLCP-WORK-002	Work Permit Procedures

3. PERSONNEL QUALIFICATIONS

3.1 General Requirements

All NDE personnel shall be qualified and certified in accordance with a written practice meeting the requirements of ASNT SNT-TC-1A or ASNT CP-189. Certification records shall be provided to GLCP

Inspection Department prior to mobilization.

3.2 Minimum Qualification Levels

Activity	Minimum Level	Experience Required
UT Thickness Measurement	Level II	2 years refinery/petrochemical
UT Flaw Detection	Level II	3 years, specific training required
MT/PT Surface Examination	Level II	1 year
VT Piping Inspection	Level II	2 years refinery/petrochemical
RT Interpretation	Level II	2 years
Lead Inspector/Supervisor	Level II or III	5 years refinery/petrochemical

3.3 Site-Specific Training

All contractor personnel shall complete GLCP site-specific safety orientation (minimum 4 hours) prior to commencing work. This includes: H2S awareness training, emergency response procedures, permit-to-work system overview, and unit-specific hazards. Orientation is valid for 3 years from completion date.

4. EQUIPMENT REQUIREMENTS

4.1 Ultrasonic Thickness Gauges

All UT thickness gauges shall meet the following minimum requirements:

• Digital display with minimum resolution of 0.001 inch

• Data logging capability with minimum 1000 reading storage

• Capable of operating in temperature range 32°F to 120°F

• Battery life sufficient for full shift operation (minimum 8 hours)

• Dual or multi-element transducer capability for high-temperature applications

4.2 Calibration Requirements

All measurement equipment shall have current calibration traceable to NIST or equivalent national standards body. Calibration certificates shall be provided showing calibration date, due date, and standards used.

Equipment Type	Calibration Interval	Verification Frequency
UT Thickness Gauge	12 months	Daily (before use)
UT Transducers	12 months	Daily (with gauge)
Calibration Blocks	24 months	N/A
Yoke/Prod (MT)	12 months	Before each use

4.3 Daily Calibration Verification

UT thickness gauges shall be verified at the start of each work shift using a multi-step calibration block. Verification shall be performed on steps bracketing the expected measurement range. Acceptable deviation is ±0.002 inch. Verification shall be documented with date, time, operator, and readings.

5. ULTRASONIC THICKNESS MEASUREMENT PROCEDURES

5.1 Surface Preparation

The measurement surface shall be prepared to remove loose scale, rust, paint, or other materials that may interfere with coupling. Preparation methods may include wire brushing, grinding, or scraping. Surface shall be smooth enough to achieve consistent couplant contact. For painted surfaces, paint removal is required unless coating thickness is less than 10 mils and consistent.

5.2 Couplant

Water-based or glycerin-based couplant shall be used. For elevated temperature surfaces (above 150°F), high-temperature couplant rated for the service temperature shall be used. Couplant shall be removed after measurement to prevent interference with coatings or corrosion protection systems.

5.3 Measurement Technique

A minimum of four (4) readings shall be taken at each CML location, spaced approximately 90° apart around the circumference. The minimum reading shall be recorded as the official measurement. For suspected localized corrosion, additional readings in a grid pattern may be required.

5.4 Material Velocity Settings

Material	Velocity (in/μs)	Notes

Carbon Steel (A106, A53)	0.2330	Default for CS piping
316/304 Stainless Steel	0.2260	Austenitic SS
Duplex Stainless Steel	0.2290	Verify with material cert
Chrome-Moly Steel	0.2330	Same as CS
Aluminum	0.2500	Verify alloy

6. ACCEPTANCE CRITERIA AND NOTIFICATIONS

6.1 Minimum Thickness (t-min)

Minimum required thickness shall be calculated in accordance with ASME B31.3 or the original design code. t-min values for each piping circuit are provided in the inspection data packages. Readings below t-min require immediate notification per Section 6.3.

6.2 Alert Thresholds

Condition	Threshold	Required Action
CRITICAL	Reading < t-min	STOP - Immediate notification to GLCP
Alert	Reading < 110% of t-min	Notify GLCP within same shift
Monitor	Corrosion rate > 10 mpy	Document in report, recommend action
Acceptable	All other readings	Document in report

6.3 Notification Procedures

For CRITICAL findings (readings below t-min), the contractor shall:

1. Immediately cease work at the affected location
2. Verify the reading with repeat measurement
3. Contact GLCP Inspection Coordinator by radio or phone
4. Do not leave the area until GLCP representative arrives
5. Document the finding with photographs and detailed notes
6. Confirm reading with GLCP representative present

GLCP Inspection Coordinator: Jennifer Walsh, (905) 555-0147, Radio Channel 3

7. DOCUMENTATION REQUIREMENTS

7.1 Data Recording

All thickness readings shall be recorded electronically using data logging equipment. Manual recording is not acceptable except as backup. Data shall include: CML identification, reading value, date, time, operator ID, and equipment serial number.

7.2 Photographic Documentation

Photographs are required for:

• Each CML location showing tag/identification

• Gauge display for all CRITICAL and Alert readings

• Surface condition for any unusual findings

• Inaccessible locations with explanation

• Daily calibration verification setup

7.3 Report Format

Inspection reports shall include as a minimum: executive summary, scope of work, equipment and personnel used, inspection results tabulated by line and CML, trending comparison with historical data, list of all findings by category, recommendations, and appendices with raw data and photographs.

8. SAFETY REQUIREMENTS

8.1 Permits

All inspection work requires a valid General Work Permit. Additional permits (Elevated Work, Hot Work, Confined Space) may be required depending on location and activities. Permits shall be obtained from the Control Room before starting work each day.

8.2 H2S Monitoring

All personnel working in the Amine Treating Unit shall carry a personal H2S monitor. Monitors are provided by GLCP and issued daily at the Control Room. Alarm setpoints: Low alarm at 10 ppm, High alarm at 15 ppm. Upon high alarm, evacuate upwind immediately and report to muster point.

8.3 PPE Requirements

• Hard hat (GLCP-issued sticker required)

• Safety glasses (side shields required)

• Steel-toed boots (minimum 6-inch height)

• FR clothing (minimum ATPV 8 cal/cm²)

• Work gloves (leather or equivalent)

• H2S monitor (GLCP-provided)

• Hearing protection (required in designated areas)

REVISION HISTORY

Rev	Date	Description	Author
0	Mar 2018	Initial issue	J. Walsh
1	Jan 2020	Updated calibration requirements	J. Walsh
2	Jun 2022	Added H2S monitoring requirements	M. Sullivan
3	Jan 2024	Updated alert thresholds, added photo requirements	J. Walsh

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