



Introduction

The NASSCO Pipeline Assessment Certification Program® (PACP®) training course provides a thorough introduction to the PACP® coding procedures, as well as an opportunity for students to ask questions and clarify various aspects of the program. PACP® coding procedures are reviewed, and the student must demonstrate an understanding of the contents through the successful completion of a certification examination.

Users will be required to successfully complete recertification every three years.

The objectives of the training course are as follows:

Day 1

PIPELINE ASSESSMENT CERTIFICATION PROGRAM® (PACP®)

- Module 0 Overview
- Module 1 Introduction and Need for Categorization (Section 1 of the PACP® Reference Manual)
- Module 2 PACP® Header Section (Section 2 of the PACP® Reference Manual)
- Module 3 PACP® Details Section (Section 3 of the PACP® Reference Manual)
- Module 4 Structural Defect Coding (Section 4 of the PACP® Reference Manual)

Day 2

PIPELINE ASSESSMENT CERTIFICATION PROGRAM® (PACP®)

- Module 5 Operation and Maintenance Coding (Section 5 of the PACP® Reference Manual)
- Module 6 Construction Features Coding (Section 6 of the PACP® Reference Manual)
- Module 7 Miscellaneous Features Coding (Section 7 of the PACP® Reference Manual)
- Module 10 Appendices
- Module 11 Practice Pictures
- Module 12 Appendix D (optional)
- Module 13 Appendix E (optional)
- Course Review and Sample Coding
- Certification Examination



Day 3

MANHOLE ASSESSMENT CERTIFICATION PROGRAM® (MACP®)

Module 8.1 Introduction

Module 8.2 MACP® Header and Component Observations Sections

Module 8.3 MACP® Component Defect Section

Course Review

Certification Examination

LATERAL ASSESSMENT CERTIFICATION PROGRAM® (LACP®)

Module 9 Introduction, Header Section, Details Section

Course Review

Certification Examination

The primary purpose of PACP® training and certification is to assure that all data gathered to describe the conditions within a pipe are collected and coded in a consistent and reliable manner. PACP® is all about the data, and it is your responsibility to accurately and consistently code each defect and observation. It is important for the student to understand how the PACP manual is arranged and learn how to use it effectively.

Accurate, complete data is the most important aspect of PACP®. Certified users of PACP® must accept personal responsibility to accurately code each defect and ensure that the data entered in PACP® is correct and complete. The certification training is not intended to test memorization skills, but rather to train individuals on how to use the manual. This manual should be used regularly by the practicing certified technician as an on-going reference to determine how to code different observations as they are discovered during inspections.

The following is a summary of each chapter in the manual:

Introduction and Need for Condition Classification (Section 1) – This section discusses the origin and importance of standardization through PACP, as well as general PACP requirements such as visibility during CCTV inspection, camera setup and movement and lighting. Finally, it provides detail into known deterioration mechanisms that relate directly to defects observed in pipelines.



Header Section (Section 2) – The Header Section is the first of two data collection sections that make up the PACP Inspection Form. The Header Section is used to collect general information about the inspection. Header information includes the name of the surveyor, the name of the system owner, pipe material and many other data fields. This manual section provides a detailed description of each field, the type of data entered, and whether the entry is mandatory or not. In addition, it also discusses “custom” fields that can be customized and used at the surveyor’s (or owner’s) discretion.

Details Section (Section 3) – The Details Section is used to record individual observations at specific distances and clock positions. This section of the form is presented as a series of columns. Each observation (which is documented with a PACP Code) requires specific information to be entered in specific columns. Sections 4, 5, 6 and 7 are arranged to define what is entered in each column based on the PACP Code.

Coding Families (Sections 4 through 7) – These manual sections describe the use of PACP observation and defect codes. Following a general description of the defect, they describe all the required entries, column by column, that are entered in the Details Section. The pages following each code’s description provide example photographs of coded defects for reference.

Structural Defects (Section 4) – This section includes detailed information about the defect codes that impact the structural properties of a pipe such as Crack, Fracture, Broken, Hole, Deformed, Collapsed, Joint, Surface Damage, Weld Failure, Point Repair, Lining Features and Brickwork.

Operation and Maintenance Defects (Section 5) – This section includes details on the O&M related defect codes such as Deposits, Roots, Infiltration, Obstacles/Obstructions, Vermin and Testing and Grouting.

Construction Features (Section 6) – This section includes information on features and related defects that were built into the sewer. The Construction Features include Taps (lateral connections), Intruding Seal Material, Line (direction/alignment of pipe) and Access Points.

Miscellaneous Features (Section 7) – This section includes the description and related defects for features that are not included in the other PACP categories. The codes covered here include Camera Underwater, General Observation, Shape/Size Change, Material Change, Survey Abandoned and several others.



Manhole Assessment Certification Program MACP® (Section 8) – This manual section provides guidance on MACP inspections of manholes and other access points within piping systems. MACP inspections are different from PACP inspections due to the many components that make up the manhole. After describing each of the components and defining Level 1 and Level 2 inspections, this section explains the use of each field in the MACP Header Section and the Manhole Component Observation Section of the MACP Inspection Form. It also provides instructions in the use of the Manhole Component Defect Section, which is specifically used for Level 2 inspections.

Lateral Assessment Certification Program LACP® (Section 9) – This manual section provides guidance on LACP inspections of laterals. There are many similarities between LACP and PACP. LACP does include unique access point codes and fitting codes. The Header and Details Sections of the overall LACP Inspection Form, which are similar but not identical to PACP, are described in detail.

Appendix A: Listing of Codes in Alphabetical Order – This appendix provides a listing of each PACP code in alphabetical order, including code descriptions and which columns in the details section are mandatory or optional.

Appendix B: Color Coded Chart – This chart provides an easy code reference sorted by family and group of codes, and includes the Manual page number where each specific code can be found. If, for example, you look in “Section 4 - Structural Defects Coding”, you will see “Crack”. To the left of the word Crack is the letter “C”. That is the PACP Code for a crack. To the right of the word “Crack” is the number 4-2. That indicates that detailed information about coding a crack in PACP® is found in Section 4, Page 2 of the manual. In the same box, below the heading “Crack”, is a list of the various modifiers that can be used to describe cracks in PACP®.

Appendix C: Condition Grading System – This appendix provides PACP condition grading system details for pipelines, laterals and manholes. Example calculations are provided to convert continuous defects to an equivalent number of point defects. An explanation is also given on how to use the data to calculate quick ratings, overall ratings and ratings indices.

Appendix D: PACP Based Risk Management – This appendix defines risk management and then provides calculations to convert the PACP quick rating to a Likelihood of Failure (LoF) score. It also includes sample calculations and assumptions used to calculate Consequence of Failure (CoF) separately from LoF. Risk can be visually represented by plotting CoF versus LoF. An example of how to use a CoF vs. LoF plot to determine rehabilitation priorities is also included in the appendix.

Appendix E: Pipe Shapes and Materials – This appendix provides pipe shape diagrams and photographs of various pipe materials to help the inspector identify the materials and shapes that are listed in the PACP and the LACP header sections.