



MAGNETIC ANALYSIS CORPORATION

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LEVEL I/II EDDY CURRENT TRAINING PROGRAM

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INTRODUCTION

Since installation of the first electromagnetic inspection equipment in this country in the mid 1930's, Magnetic Analysis Corporation has attempted to provide its customers with training services to assure that operators of the equipment we sell & lease, are properly instructed in the use of the instrument. In addition, our company has on numerous occasions, conducted special short-term courses on eddy current theory and application where the needs of the particular customer justified the time and expense.

In an effort to improve the reliability of non-destructive techniques, the American Society for Non-destructive Testing has instituted a program of personnel qualification and certification. This program applies to employers who utilize eddy current test techniques.

As part of our continuing service to our customers, MAC has now revised and upgraded our training program. This program is also offered to companies or individuals who are not now our customers. This leaflet describes the eddy current program and its intended purpose.

Training Program Objectives

1. To provide background and understanding of fundamental principles of eddy current inspection.
2. To familiarize students with general types of eddy current test systems, their relative advantages and shortcomings.
3. To illustrate and explain the application of eddy current test systems to meet modern inspection requirements and normal industrial or government specifications.
4. Fulfill SNT-TC1A qualification requirements for training and examinations

Course of Study

The course outline (see page 6) has been drawn to conform to the requirements of the ASNT, recommended practice SNT-TC-1A for both Level I and Level II.

In addition, the course includes suitable material on the practical application of eddy current systems to actual inspection problems.

A combination of lectures, discussions and laboratory sessions will be utilized to provide instruction. A variety of eddy current equipment will be available together with sample materials. Because of the limited class size, each student will have an opportunity to participate directly in the discussions.

This is a progressive training course, i.e., consideration as Level I is based on satisfactory completion of the Level I training course; consideration as Level II is based on satisfactory completion of both Level I and Level II training courses.

Topics in the training outline may be deleted or expanded to meet the employer's specific applications or for limited certification and may be accompanied by a corresponding change in training hours.

Texts

The necessary text material is provided by MAC.

Tests

Since many students will be undertaking this course of study to prepare for certification as Level I or Level II personnel, questions from ASNT-TC-1A will be included as part of the written examinations.

Diploma

Upon satisfactory completion of the course of study and performance on the examinations, MAC will award the student an Eddy Current diploma.

This diploma does not constitute certification as required under the recommended practice of the ASNT; such certification can only be performed by the employer. Rather, the diploma will indicate that in the judgment of MAC, the student has completed sufficient theoretical and laboratory work to qualify for the performance of actual tests or to direct the setup of such tests. In the judgment of MAC, neither completion of this course nor time spent on the job is satisfactory evidence that any applicant is qualified to actually run a test or supervise it. These qualifications can only be obtained by actual inspection experience with a particular equipment on a general class of product.

The diploma awarded by MAC includes on its reverse side an endorsement listing each type of equipment for which qualification has been obtained. In this manner, the diploma provides an overall record of the background, training, and specific equipment qualifications for each individual.

Facilities and Faculty

Except as otherwise arranged, all courses of study will be offered at Elmsford, New York, at MAC's global headquarters and manufacturing plant. The program and instructors will be under the supervision of a Magnetic Analysis ASNT NDT Level III.

Entry Requirements

Because these courses will include theoretical discussion as well as practical application work, students should be high school graduates. A working knowledge of simple algebra and geometry is desirable. Familiarity with metallurgical terminology and processes, plus some experience with test equipment and procedures is also desirable.

The requirement of high school graduation will be waived only if the application is accompanied by a letter from the student's employer attesting that the student is, in other respects, fully qualified for the program.

Application

An application is included in the back of this leaflet. Applications must be received a minimum of two weeks prior to the start of the training session. There can be no refund of tuition for cancellation or failure to attend. A substitute attendee may be accepted if sufficient notice is provided.

Living Accommodations

All travel and living expenses must be paid by the student and are not included in tuition. MAC has a corporate rate and will make suitable living accommodations at the Springhill Suites Marriott located in Tarrytown, NY (non-smoking hotel). MAC will assist with transportation to and from the hotel to the plant.

Tuition Fee

\$1,500 per student, includes training materials and lunches.

EDDY CURRENT COURSE OUTLINE**DAY 1**

- 1.0 COURSE INTRODUCTION
- 2.0 MATHEMATICAL FUNDAMENTALS
- 3.0 EDDY CURRENT TESTING INTRODUCTION
- 4.0 BASIC ELECTRICAL THEORY
- 5.0 MAGNETIC FIELD PROPERTIES
- 6.0 ELECTROMAGNETIC INDUCTION THEORY
- 7.0 COIL IMPEDANCE CHARACTERISTICS
- 8.0 EDDY CURRENT PENETRATION IN MATERIALS

DAY 2

- 9.0 MATERIAL MAGNETIZATION
- 10.0 TEST INSTRUMENT SIGNAL PROCESSING
- 11.0 READOUT SIGNAL ANALYSIS
- 12.0 TESTING MODES
- 13.0 FLAW DISCRIMINATION
- 14.0 CALIBRATION AND REFERENCE STANDARDS

DAY 3

- 15.0 TEST EQUIPMENT ADAPTATION
- 16.0 TEST COIL DESIGN AND APPLICATION PRINCIPLES
- 17.0 COIL MANUFACTURING
- 18.0 SPECIAL PURPOSE COILS
- 19.0 PROBE COILS
- 20.0 COIL PERFORMANCE FACTORS
- 21.0 DEMAGNETIZING

DAY 4

- 22.0 INTRODUCTION TO METALS PROCESSING
- 23.0 ROTARY PROBE FLAW INSPECTION
- 24.0 SORTING EQUIPMENT
- 25.0 MAGNETO-INDUCTIVE TESTING
- 26.0 IMPEDANCE PLANE DIAGRAMS

DAY 5

- 27.0 MultiMac® NAVIGATION/SETUP
(PRACTICAL HANDS-ON TRAINING)

EDDY CURRENT COURSE APPLICATION

Date:			
Name of Applicant:			
Address of Applicant:			
Present Employer:			
Employer Address:			
Telephone number:		Ext.:	
Email address:			
Education:			
Work Experience in NDT Field:			
Work Experience with Following Equipment:			
COURSE TUITION RATE: \$1,500 per student			
Golf Shirt size: () med () large () XL () XXL () XXXL			
I will arrive on:		at approximately:	
I will depart on:		at approximately:	