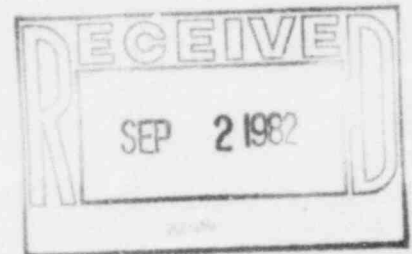




*Research, Development and Engineering Division*

*ITT Grinnell Corporation  
Executive Offices  
260 West Exchange Street  
Providence, Rhode Island 02901  
(401) 831-7000*

August 28, 1982



U. S. Nuclear Regulatory Commission  
Region IV  
611 Ryan Plaza Drive  
Suite 1000  
Arlington, Texas 76011

ATTENTION: Mr. Uldis Potapova, Chief  
Vendor Program Branch

SUBJECT: Docket No. 999 00019/82-01  
Your Letter August 6, 1982

Gentlemen:

The following is in reply to your letter of August 6, 1982.

The radiographic films reviewed for penetrometer enhancement were all of the films in the possession of the Kernersville Plant. They involved the films from all of the radiographers who had performed radiography on the Tennessee Valley Authority's Hartsville contract, and on the Niagara Mohawk Nine Mile Point Nuclear Power Station Unit 2 contract.

This will confirm that not only the Kernersville Nondestructive Examination personnel, but also, all other ITT Nondestructive Examination personnel have been re-instructed by Corporate Nondestructive Examination personnel, emphasizing the application of correct radiographic inspection techniques.

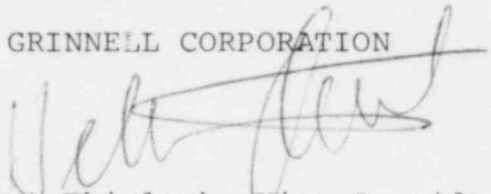
Throughout each of the training programs conducted, it was emphasized that any alteration of penetrometer images, identifications, etc., was not permissible.

8209200222 820915  
PDR GA999 EMVITIGI  
99900019 PDR

Of the radiographic films examined with apparent penetrameter image enhancement, the welds reviewed represented acceptable weld quality levels with films represented by density conditions which were readily interpretable to the requirements of Section III of the ASME Boiler and Pressure Vessel Code. Thus, the welds reviewed would be entirely acceptable and suitable for the service requirements.

Very truly yours,

ITT GRINNELL CORPORATION

A handwritten signature in dark ink, appearing to read 'Helmut Thielsch', written over the typed name below.

Helmut Thielsch, Vice President  
Research, Development and Engineering

HT:1

cc: Mr. R. E. Miller  
Mr. A. S. Laurenson

- Failures, Failure Prevention and Repairs of Pressure Vessels, Piping and Rotating Machinery

DESIGNATED ORIGINAL  
Certified By Reanne Jouts

## ASME Short Course Program

December 1-2, 1982  
Orlando, FLA



## FAILURES, FAILURE PREVENTION AND REPAIRS OF PRESSURE VESSELS, PIPING AND ROTATING MACHINERY

Wednesday-Thursday  
December 1-2, 1982  
8:30 a.m.-4:30 p.m.

Course Fee  
ASME Members: \$380.00  
Non-Members: \$470.00

### WHO SHOULD ATTEND

Users, manufacturers, repair organization and inspection agency representatives involved in new construction (design and fabrication) and repair of alterations of pressure vessels, boilers, piping, tanks, compressors, turbines, heat exchangers, digesters, valves and gears.

### TEXT

Attendees will receive a copy of the text book, "Defects & Failures in Pressure Vessels and Piping" and notes based on the course content.

### DETECTING TYPES AND CAUSES OF FAILURES

Types of cracks, tears and other defects in welds, castings, forgings, and other base materials are examined with respect to the conditions which cause or do not cause progressive or sudden failures. Certain cracks may be inconsequential as with fabricated or heat treated materials. Operational failures in pressure vessels, piping, tanks, compressors, turbines, heat exchangers, digesters, valves, and gears will be discussed along with fabrication and welding defects, cracks, and microfissures. Discover how to locate hidden defects: residual stresses, metal straining, embrittlement due to hydrogen, graphitization and sensitization. Learn to detect flaw propagation, creep deformation, fatigue, shock loading, stress corrosion, erosion and thermal cycling, base metal defects, laminations, and forging tears.

### NONDESTRUCTIVE TESTING, TEST INTERPRETATIONS AND INSPECTION

Proper use and interpretation of various nondestructive tests using illustrations of stable, weakened, and failed materials and the benefits, when applicable, of periodic inspections will be analyzed. Conditions leading to failures which are not detected by common nondestructive tests are examined.

### CODE ALTERATION AND REPAIR PROCEDURES

Code, design aspects, and detailed repair procedures such as welding, bolting, metal locking and heat treatment will be explored. Improper repair consequences are illustrated including examples of minor leaks which have subsequently resulted in progressive and/or catastrophic failures. The adequacy of repairs to provide temporary or permanent solutions will be examined. Product liability and insurance coverage considerations are presented.

### CASE HISTORIES OF MAINTENANCE, FAILURES, AND REPAIR DECISION MAKING WITH ECONOMIC CONSIDERATIONS OF FAILED COMPONENT REPAIR VS. REPLACEMENT

The decision making process will be applied to situations demanding immediate repairs and to situations where repairs can be delayed for three, six and twelve months.

Strong emphasis is placed on purchasing, fabricating, maintaining and repairing equipment at the lowest possible cost while assuring non-failure. Case histories will be examined that detail many millions of company dollars saved. The cost savings were accomplished by successful repair welding of pressure vessels, turbines, boilers, piping, gears and other parts according to carefully planned and supervised procedures. Comparison is made with similar situations in other plants where lack of available experience and expertise resulted in unnecessary dismantling and/or replacement of the same parts or components. Details of successful repair procedures will be provided.

### INSTRUCTOR

**Helmut Thielsch** is Vice President of Research, Development and Engineering at ITT Grinnell Corporation in Providence, Rhode Island. He has been extensively involved in performing failure analyses of piping and pressure vessel, components, compressors, turbines, valves, pumps, fittings, gears, structures and other metal products.

He has served as a consultant to major utilities, petrochemical plants, industrial plants and manufacturing companies. Mr. Thielsch is a Fellow Member of the ASME, ASM and ASNT Societies. Other society memberships include AWS, ASTM, ASQC, ACS, ANS, NACE. He serves on many of these organizations' national codes and standards committees. Mr. Thielsch has authored 150 professional engineering papers covering various aspects of failure analysis, piping and pressure vessel materials, quality assurance, and destructive and non-destructive testing. He is author of the book "Defects and Failures in Pressure Vessels and Piping," and has written chapters for Handbooks by the ASME, ASM, AWS and the Piping Handbook.

Mr. Thielsch was the 1982 recipient of the Adams Lecture Award by the American Welding Society.

### REGISTRATION AND FEE

Please refer to each course description for fees.

Registration should be made in advance to insure availability of space in the course. Class size is limited to insure optimum interaction among all participants. Complete and return the enclosed form and you will receive a written confirmation of your registration. **If you do not receive this confirmation letter, please call (212) 705-7743 to check your enrollment status.**

The course fee is payable in advance and includes the cost of texts (other than ASME Code Books), classroom materials, coffee breaks, and any scheduled food functions. The fee does not include expenses for hotel accommodations or other meals. Payment may be made by check, money order, or invoicing of your company. **Please note that there is a \$20.00 service charge for invoicing of your company.** Be sure to include attendee name(s) and course title(s) with check. Please make checks payable to ASME.

A portion of the difference in the registration fee paid by a non-member will be credited toward his/her first year's dues if application for membership is received within thirty days after the meeting.

Attendees who have preregistered may obtain their classroom materials at 7:00 a.m. on the morning of the first course day.

## DISCOUNT POLICY

Registrants may be eligible for **ONE** of the following discounts:

- One registrant will receive a 10% discount if payment is received or arrangements made for billing by **November 3, 1982**.
- Three or more registrants from the same company registering together, for the same course will receive a 15% discount if payment is received in full or arrangements made for billing by **November 3, 1982**.
- A full time student member will receive a 50% discount if course space is available.
- An ASME Life Member will receive a 50% discount if course space is available.

## HOTEL RESERVATIONS

Reservations should be made directly with the hotel by **NOVEMBER 9, 1982** to assure accommodation. Please use the hotel reservation card included with your confirmation letter. **PHONE RESERVATIONS WILL ONLY BE ACCEPTED AFTER NOVEMBER 9, 1982** by calling (305) 828-4444. Be sure to mention that you will be attending the ASME Short Course Program in order to receive the reduced room rates. There will be no additional charge for one or two children under 18 years of age occupying the same room as their parents, as long as no additional beds are required.

<b>Dutch Resort Hotel</b>	<b>Room Rates:</b>
<b>1850 Preview Boulevard</b>	<b>Single or Double: \$65.00</b>
<b>Lake Buena Vista, FL 32830</b>	

## RECEPTION AND LUNCHEON

Participants are invited to attend the Reception on Wednesday, December 1st; 5:30-7:00 p.m., and the Luncheon on Thursday, December 2nd; 12:00-1:00 p.m. These events will give you the opportunity to meet with the course instructors personally, and to exchange ideas with other participants.

## CANCELLATIONS

Course cancellations should be received by Wednesday, November 17, 1982 to insure a full refund. Cancellations received after this date will be subject to a 15% service charge. Substitution of attendees may be made at any time prior to the beginning of the course. ASME reserves the right to cancel courses below the minimum attendance limits. Full refunds will be made in such cases.

## EPCOT

Walt Disney's EPCOT Center will be opening on October 1, 1982. It is located just a few miles from Walt Disney World. EPCOT is a futuristic look at science and industry, as well as a look back at history. You will see technological advances in the fields of energy, communications, transportation, etc. EPCOT should prove to be a very interesting learning and entertaining experience. The hotel provides complimentary transportation to the EPCOT Center.

## NOTICES

- All statements made by the speakers represent their opinion alone and do not necessarily represent the position of the sponsoring organization.
- No taping may be conducted by participants without express written consent of the speakers and sponsors.
- The sponsors reserve the right to substitute speakers in the event of unusual circumstances.
- ASME does not sell the course notes. You must attend the course in order to receive the material.

## TAX DEDUCTION OF EXPENSES

An income tax deduction is allowed for expenses of continuing education undertaken to maintain and improve professional skills. See Treas. Reg. 1.162-5.

## INQUIRIES

Information concerning this program or other programs may be obtained by writing or calling:

ASME  
Professional Development  
345 East 47th Street  
New York, N.Y. 10017  
(212)705-7743  
TWX 710-581-5267

**REGISTRATION FORM  
ASME SHORT COURSE PROGRAM  
DECEMBER 1-3, 1982**

DUTCH RESORT INN

LAKE BUENA VISTA, FLORIDA

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

ORGANIZATION \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

BUSINESS PHONE ( ) \_\_\_\_\_

ASME MEMBERSHIP NUMBER \_\_\_\_\_

NON-MEMBER SOCIAL SECURITY NUMBER \_\_\_\_\_  
(used for data bank purposes only)

COURSE	FEE	
	ASME Members	Non-Members
_____ Failures, Failure Prevention and Repairs of Pressure Vessels, Piping and Rotating Machinery	\$380.00	\$470.00

Discount: \$\_\_\_\_\_ (Refer to Discount Section)

P.O. #: \$\_\_\_\_\_

Total fee enclosed: \$\_\_\_\_\_

Bill my company: \$\_\_\_\_\_ (Add \$20.00 service charge to fee)

**PLEASE MAKE CHECKS PAYABLE TO ASME**  
(Be sure to include attendee name(s) and course title with check)

**MAIL to: ASME**  
Professional Development/OCP  
345 East 47th Street  
New York, NY 10017



# Failures, Failure Prevention and Repairs of Pressure Vessels, Piping and Rotating Machinery

19-21 October 1982



Academy for Metals and Materials

- Intensive instructions in how to interpret nondestructive test data
- How to distinguish serious from inconsequential defects
- When to repair, when not to repair, and when to replace
- How to build components that will not fail.

The course will provide you with knowledge relating to the causes of piping, pressure vessels and rotating machinery failures and indicate appropriate corrective measures through changes in design, fabrication or erection. Additionally, you will learn about the importance of a properly engineered maintenance program, designed to prevent failures.

This course provides a review of the major types of causes of failures, the effective utilization of meaningful nondestructive testing, and the benefit, when applicable, of periodic inspections. Proper utilization and interpretation of various nondestructive tests are described, using illustrations of stable, weakened and failed materials. Conditions leading to failures which are not detected by common nondestructive tests are examined. Various types of cracks, tears and other defects are examined with respect to the conditions under which they cause, or do not cause progressive or sudden failures. You will discover how to locate hidden defects: residual stresses, metal straining, embrittlement due to hydrogen, graphitization and sensitization. You will also learn to detect flaw propagation, creep deformation, fatigue, shock loading, stress corrosion, erosion and thermal cycling, base metal defects, laminations, and forging tears.

Code and design aspects are discussed. Repair procedures are described in detail, including welding, bolting, metal locking and heat treatment. The consequences of improper repairs are illustrated, including examples of minor leaks which have subsequently resulted in progressive and/or in catastrophic failures. The adequacy of repairs to provide temporary or permanent solutions is also illustrated in detail. You will learn how repairs of inconsequential defects may actually decrease the life of the structure.

The short and long term economic importance of correct decisions between repair and replacement will be emphasized as specific examples are discussed. The overriding purpose is to purchase, fabricate, maintain and repair equipment which does not fail at the lowest cost.

## PROGRAM

- Operational failures in pressure vessels, piping, tanks, compressors, turbines, heat exchangers, digesters and valves.
- Nondestructive testing, test interpretations, and repair decision making.
- Base metal defects, laminations, forging tears, etc.

- Fabrication and welding defects, cracks, microfissures, etc.
- Hidden defects, such as residual stresses, metal straining, embrittlement due to hydrogen, graphitization, sensitization, etc.
- Flaw propagation, creep deformation, fatigue, shock loading, stress corrosion, erosion and thermal cycling.
- Case histories of maintenance, repairs and failures with economic considerations of repair versus replacement of failed components.

Operational failures in piping systems, the occurrence and effects of base metal defects and, most importantly, what to do about such defects, will be discussed. When are repair welds necessary and when do such repair welds actually aggravate the condition? The effective use of preheat and postheat as well as sophisticated repair weld procedures to assure adequate service performance will be demonstrated.

Actual service failures will be discussed as well as the techniques used for the prevention of such failures. Flaw propagation will be discussed with many examples from actual service. The effect of creep, stress corrosion, erosion, thermal cycling, thermal fatigue induced by vibration will be shown with actual service examples summarizing some 35 years of experience in this field. Finally, non-destructive examination of piping, pressure vessels and rotating machinery and proper interpretation of NDE information will complete the program. Correct interpretation of NDE information is ultimately important if an economic and effective maintenance program is to be realized.

You will review case histories where companies have saved millions of dollars. These cost savings were accomplished by successful repair welding of pressure vessels, turbines, boilers, piping, gears and other parts according to carefully planned and supervised procedures.

## WHO SHOULD ATTEND

This course is intended for engineers and metallurgists concerned with the continuous and safe operation of piping systems, pressure vessels and rotating machinery. Designers, fabricators, erectors and inspectors can benefit from the study of hundreds of examples of the evaluation of imperfections and their effect on service.

**FEE: \$695 (ASM members \$565/2 CEU). Fee includes the book, "Defects and Failures in Pressure Vessels and Piping".**



## THE INSTRUCTORS:

**Course Director: Helmut Thielsch** is Vice President of Research, Development and Engineering at ITT Grinnell Corporation.

**J.M. Schmerling** is Project Manager at Westinghouse Electric Corporation, Philadelphia, PA.

**R. Foale** is Vice President at J.M. Devine Company, Cranston, RI.



Cleveland - Oct. 19-21 Marriott Inn Airport (216) 252-5333

Send To: American Society for Metals  
Education Department  
Metals Park, Ohio 44073  
Telephone: (216) 338-6151 Ext. 615

## REGISTRATION FORM

Tax Deduction of Expenses: An income tax deduction is allowed for expenses of education (including registration fees, travel, meals, lodging) undertaken to maintain and improve professional skills (see Treas. Reg. 1.162-5).

Oct. 19-21, 1982 Marriott-Cleveland..... Failure Prevention..... \$595 (ASM members \$565)

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State/Prov. \_\_\_\_\_ Zip \_\_\_\_\_

ASM Member Number \_\_\_\_\_  Check enclosed  P.O. No. \_\_\_\_\_

MTQC