PETROSYNC
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API 571
Damage Mechanisms Affecting Fixed Equipment in the Refining Industry

Identifying and Understanding The Relevant Damage Mechanism

16th - 20th March 2020 at Kuala Lumpur, Malaysia | 22nd - 26th June 2020 at Bandung, Indonesia

23rd - 27th November 2020 at Kuala Lumpur, Malaysia

Petrosync Lecturer

Chintamani M. Khade

Technical Director of Empirical Technocrats, India

Case Studies, Discussion, and many Practical exercises!

Summary of Professional Achievement:

- API 571 - Specialist Materials & Damamge Mechanisms - Certificate #50420
- API 653 - Authorised Aboveground Storage Tank Inspector - Certificate #27295
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- API 570 - Authorised Process Piping Inspector - Certificate #38775
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- API SIRE - Authorised Source Inspector Rotary Equipments - Certificate #63572
- NDE Level III (ASNT) (UT, MT, RT, PT, VT, LT, ET & IR) - Certificate #126348
- Level 3 (EN 473 /ISO 9712) (UT, MT, PT , RT & VT) - Cert. No 07-502-04964
- Welding Inspector (TWI) (CSWIP 3.1) - Certificate #58523

Masterclass Objectives

- Key parameters in each damage mechanism like material selection, design, fabrication, process control, etc.
- Critical factors involved in damage mechanism, their prevention / mitigation and monitoring methods.
- Assessment of various damage mechanism during Fitness for Service assesments (FFS), Remaining Life Assessments (RLA) or Risk Based Inspection Studies (RBI).
- Selection between various tests and examinations (or combination) to identify, locate and assess damage mechanisms.
- Mitigation methods and techniques.
- Similarities and differences in different damage mechanisms.

Supported by

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Masterclass Overview

This course is based on damage mechanisms in refining, petrochemical and other process industries.

It focuses not only on different materials propertiesand process fluid characteristics but also on different processes environment parameters which leads to damage mechanisms. They can be interdependent and cause damage mechanisms to initiate, propagate individually or simultaneously.

The course also contains the useful information like material selection, design considerations, operations, necessary to determine the causes of damages/ deterioration present and probable inspection. Various examination and testing methods, other techniques for determining the type size and location of damage mechanisms, monitoring or mitigation techniques for each damage mechanism also will be explained with case studies.

Audience

This course is specifically beneficial for personnel involved in and responsible for determining cause for damage(s) / deterioration(s) observed or anticipated and for probability and degree of further damage that might occur in future during FFS assessments RLA, Risk based inspection studies etc.

It also assists inspectors and examiners to perform their tasks effectively during in service Inspection of pressure vessels, piping and tanks.

It is beneficial for engineers, supervisors and managers who are responsible for decision making during assessment of mechanical integrity or equipment reliability.

Process and plant designers can add value during material selection and design by knowing causes of damage mechanisms at those stages. Operations personnel can understand various parameters affecting the damage mechanisms.Personnel involved in mitigation / monitoring of damage mechanisms shall have knowledge of various examination and testing techniques.

PROGRAM SCHEDULE

08:00	Registration (Day1)
08:10 – 10:00	Session I
10:00 – 10:15	Refreshment & Networking Session
10:15 – 12:30	Session II
12:30 – 13:30	Networking Buffet Lunch
13:30 – 15:00	Session III
15:00 – 15:15	Refreshment & Networking Session
15:15 – 16:00	Session IV
16:00	End of Day

*Schedule may vary for each training

Petrosync Quality

Limited Attendees
The course has limited seats to ensure maximum learning and experience for all delegates.

Certificate of Attendance
You will receive a Certificate of Attendance bearing the signatures of the Trainer upon successful completion of the course. This certificate is proof of your continuing professional development.

Interactive Training
You will be attending training designed to share both the latest knowledge and practical experience through interactive sessions. This will provide you with a deeper and more long-term understanding of your current issues.

High Quality Course Materials
Printed course manual will provide you with working materials throughout the course and will be an invaluable source of reference for you and your colleagues afterward. You can follow course progress on your laptop with soft copies provided.

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Course Agenda

Day 1

- Introduction of Trainer & Participants
- Bench Mark Quiz & Discussions on the same
- Introduction and Review Of Basic Metallurgy
- Mechanical and Metallurgical Failure Mechanisms
  - Graphitization
  - Softening (Spheroidization)
  - Temper Embrittlement
  - Strain Aging
  - 885°F (475°C) Embrittlement
  - Sigma Phase Embritllement
  - Brittle Fracture
  - Creep and Stress Rupture
  - Thermal Fatigue
  - Short Term Overheating - Stress Rupture
  - Steam Blanketing
  - Dissimilar Metal Weld (DMW) Cracking
  - Thermal Shock
- Punch Points
- Quiz & Discussions

Day 2

- Erosion/Erosion – Corrosion
- Cavitation
- Mechanical Fatigue
- Vibration-Induced Fatigue
- Refractory Degradation
- Reheat Cracking
- Gaseous Oxygen-Enhanced Ignition and Combustion
- Introduction to Corrosion
- Uniform or Localized Loss of Thickness
  - Galvanic Corrosion
  - Atmospheric Corrosion
  - Corrosion under Insulation (CUI)
  - Cooling Water Corrosion
  - Boiler Water Condensate Corrosion
- Punch Points
- Quiz & Discussions

Day 3

- Nett Positive Suction Head and Cavitation
- Flue-Gas Dew-Point Corrosion
- Microbiologically Induced Corrosion (MIC)
- Soil Corrosion
- Caustic Corrosion
- Dealloying
- Graphitic Corrosion
- High Temperature Corrosion [>400°F (204°C)]
  - Oxidation
  - Sulfidation
  - Carburization
  - Decarburization
  - Metal Dusting
  - Fuel Ash Corrosion
  - Nitriding
- Punch Points
- Quiz & Discussions

Day 4

- Environment - Assisted Cracking
  - Chloride Stress Cracking (Cl-SCC)
  - Corrosion Fatigue
  - Caustic Stress Corrosion Cracking (Caustic Embrittlement)
  - Amonia Stress Corrosion Cracking
  - Liquid Metal Embrittlement (LME)
  - Hydrogen Embrittlement (HE)
  - Ethanol Stress Corrosion Cracking (SCC)
  - Sulfate Stress Corrosion Cracking
- Refining Industry Damage Mechanisms
  - Uniform or Localized Loss in Thickness Phenomena
  - Amine Corrosion
  - Ammonium Bisulfide Corrosion (Alkaline Sour Water)
  - Ammonium Chloride Corrosion
  - Hydrochloric Acid (HCl) Corrosion
  - High Temp H2/H2S Corrosion
  - Naphtenic Acid Corrosion (NAC)
  - Phenol (Carbolic Acid) Corrosion
  - Phosphoric Acid Corrosion
- Punch Points
- Quiz & Discussions

IN-HOUSE SOLUTIONS

SAVE COST • IMPROVE PERFORMANCE • REDUCE RISK

PetroSync understands that in current economic climate, getting an excellent return on your training investment is critical for all our clients. This excellent training can be conducted exclusively for your organization. The training can be tailored to meet your specific needs at your preferred location and time. We will meet you anywhere around the globe.

If you like to know more about this excellent program, please contact on +65 3159 0800 or email general@petrosync.com

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Course Agenda

Day 5

- Sour Water Corrosion (Acidic)
- Sulfuric Acid Corrosion
- Aqueous Organic Acid Corrosion
- Environment-Assisted Cracking
  - Polythionic Acid Stress Corrosion Cracking (PASCC)
  - Amine Stress Corrosion Cracking
  - Wet H2S Damage (Blistering/HIC/SOHIC/SSC)
  - Hydrogen Stress Cracking - HF
  - Carbonate Stress Corrosion Cracking (ACSCC)
- Other Mechanisms
  - High Temperature Hydrogen Attack (HTHA)
  - Titanium Hydriding
- Punch Points
- Quiz & Discussions
- Final Examinations & Feedback

WHY YOU SHOULD ATTEND PETROSYNC'S EVENTS

- To ensure that all objectives of the course matches yours, all PetroSync programs are developed after intensive and extensive research within the industry
- PetroSync programs focus on your immediate working issues to ensure that you are able to apply and deliver immediate results in real work situations
- Application and implementation of industry knowledge and experience are the drivers for our course design, not theoretical academic lectures
- PetroSync training focuses on practical interactive learning tools and techniques including case studies, group discussions, scenarios, simulations, practical exercises and knowledge assessments during the course. Invest a small amount of your time to prepare before attending the course to ensure maximum learning
- PetroSync follows a rigorous selection process to ensure that all expert trainers have first-hand, up-to-date and practical knowledge and are leaders of their respective industrial discipline

HYBRID TRAINING SOLUTIONS

FOCUS TRAINING • REDUCE COST • ENHANCED RESULTS

Over the years, there has been a growing demand for hybrid training programs. It is an excellant option to maximize your training dollar for your specific training needs. We make it possible to run a training program that is customized totally to your training needs at a fraction of an in-house budget!

If you like to know more about this excellent program, please contact us on +65 3159 0800 or email general@petrosync.com

Petrosync Lecturer

Chintamani M. Khade

Technical Director of Empirical Technocrats

Chintamani M. Khade is a specialist on Materials & Damage Mechanisms. He has more than 19 years experience as Department Head of NDT, Welding Inspection, In Service Inspection in India, Middle East, Southeast Asia & Africa.
Currently, he is the technical director of Empirical Technocrats.

He conducted training for various API Certification Preparatory, NDE methods, ASNT & ISNT Level III, advanced NDT Methods, welding inspection, Construction codes, ASME Sections II, Section IX, Section V, ASME Sec. VIII div. 1, ASME B31.1, ASME B31.3, AWS D1.1, UT, MT, PT, VT, RT & Basic for ISO 9712 level 2 & level 3.

He has been a team leader of 100+ multidiscipline NDT technicians, metallurgists & Welding inspectors during various shutdown jobs in Qatar Petroleum, Massaid refinery, Qatar in March – June 2005, March - April 2009 & October November 2009. Executed in service inspection of nearly 800 pressure vessels, Static & rotary equipments, Plant process piping & storage tanks as shutdown coordinator.

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Partial Client List:

- RIL - Reliance Industries Limited
- GASCO
- Bangchak Petrochemicals
- Bharat Oman Refinery Limited
- Standard Rolling Mills
- Dacon Inspection Services, Thailand
- Cryeng Australia
- ZADCO
- Qatar Petroleum, Massaid Refinery
- Ras Gas
- QAFCO
- Oman LNG
- Shell
- ExxonMobil
- Total
- Chevron
- EQUATE
- GASCO
- ATB Caldereria sPa.,Italy
- Hindustan Lever Ltd.
- Tororo Cement Industries Ltd., Tororo, Uganda
- Qatar Fuel Additives CO.
- ADGAS, DAS ISLAND, Abudhabi - UAE
- L&T Hazira
- Ranoli
- Tata projects Ltd.,
- JP Industries Ltd.,
- Premier Ltd.
- McNally Bharat Engg. Co. Ltd.,
- Ravi Industries
- Pune & Sprklet Engineering, Mumbai
- Pudmjee Paper mills, Ltd.,
- Thermax Ltd., Pune
- Walchandnagar Industries Ltd.,
- TEMA Exchangers India Ltd., Gujrat
- Century Enka Ltd., Pune
- Rajashri Polyfils Gujrat
- Garware Polyestrs Ltd, Aurangabad
- Larson & Toubro Ltd. Gujrat
- Essar Oil Ltd., Gujrat
- Intervalve (I) Ltd, Pune
- Oman Methanol Co., Sohar, Oman
- Emirates Industrial Laboratory, Dubai, UAE
- Olayan Descon Engg. Co., Jubail & Yanbu works KSA
- HEMRL, ISRO
- TPT petrochemical Thailand
- Polyprima-Indorama, Indonesia
- Numaligarh Refineries Ltd. Assam.
- Sparklet Engineers
- Al Shabia, Dubai
- TUV SuD, Jubail
- KSA
- Yantrik Engineers
- NLNG
- NNPL
- Injo technical Services

INVESTMENT PACKAGES

Please checklist the package that you are attending!

	API 571 Schedules	Standard Price ☐
☐	16th - 20th March 2020 at Kuala Lumpur, Malaysia	USD 2,595
☐	22nd - 26th June 2020 at Bandung, Indonesia	USD 2,595
☐	23rd - 27th November 2020 at Kuala Lumpur, Malaysia	USD 2,595

* Price is nett excluding Withholding Tax if any and will be quoted separately. Please send us the withholding tax payment receipt.
* Price include lunches, refreshments and training materials.
* We can help to register API exam certification which incur USD 100 administration fee per application
* For API Exam late application, there will be additional fee USD 150 borne by the participant

DELEGATE DETAILS

1st Delegate Name _____ Mr ☐ Mrs ☐ Ms ☐ Dr ☐ Others ☐

Direct Line Number: _____ Email: _____

Job Title: _____ Department: _____

Mobile Number: _____ Head of Department: _____

2nd Delegate Name _____ Mr ☐ Mrs ☐ Ms ☐ Dr ☐ Others ☐

Direct Line Number: _____ Email: _____

Job Title: _____ Department: _____

Mobile Number: _____ Head of Department: _____

3rd Delegate Name _____ Mr ☐ Mrs ☐ Ms ☐ Dr ☐ Others ☐

Direct Line Number: _____ Email: _____

Job Title: _____ Department: _____

Mobile Number: _____ Head of Department: _____

* Please fill all the details including mobile number.
This help us to contact participant if they are late in class or if there is any urgent update (through WhatsApp/Call)

INVOICE DETAILS

Attention Invoice to: _____

Direct Line Number: _____ Fax: _____

Company: _____ Industry : _____

Address: _____ Postcode: _____

Country: _____ Email: _____

Please note:
- Indicate if you have already registered by Phone ☐ Fax ☐ Email ☐ Web ☐
- If you have not received an acknowledgement before the training, please call us to confirm your booking.

PAYMENT METHODS

☐ By Credit Card :

Please debit my credit card: ☐ Visa ☐ MasterCard ☐ AMEX Security Code: ☐☐☐☐

Card Number: ☐☐☐☐–☐☐☐☐–☐☐☐☐–☐☐☐☐ Expiry Date: ☐☐☐☐

Name printed on card: _____

☐ By Direct Transfer : Please quote invoice number(s) on remittance advice

PetroSync Global Pte Ltd Bank details:
Account Name: PetroSync Global Pte Ltd
Bank Name : DBS Bank Ltd
Bank Code : 7171 • Bank Swift Code : DBSSSGSGXXX • Branch code : 288
Account No : • SGD : 288-901898-0 • USD : 0288-002682-01-6
Bank Address : 12 Marina Boulevard, Level 3. Marina Bay Financial Centre Tower 3. Singapore 018982

All bank charges to be borne by payer. Please ensure that PetroSync Global Pte Ltd receives the full invoiced amount.

PROGRAMME CONSULTANT

Contact : Cay Aagen
Email : registration@petrosync.com
Phone : +65 3159 0800
Fax : +65 6826 4322

TERMS AND CONDITIONS

DISCLAIMER

Please note that trainers and topics were confirmed at the time of publishing; however, PetroSync may necessitate substitutions, alterations or cancellations of the trainers or topics. As such, PetroSync reserves the right to change or cancel any part of its published programme due to unforeseen circumstances. Any substitutions or alterations will be updated on our web page as soon as possible.

DATA PROTECTION

The information you provide will be safeguarded by PetroSync that may be used to keep you informed of relevant products and services. As an international group we may transfer your data on a global basis for the purpose indicated above. If you do not want us to share your information with other reputable companies, please tick this box ☐

CANCELLATION POLICY

Delegates who cancel after the training is officially confirmed run by email, are liable to pay the full course fee and no refunds will be granted. You may substitute delegates at any time as long as reasonable advance notice is given to PetroSync.

In the event that PetroSync cancels or postpones an event for any reason and that the delegate is unable or unwilling to attend in on the rescheduled date, you will receive a credit voucher for 100% of the contract fee paid. You may use this credit voucher for another PetroSync to be mutually agreed with PetroSync, which must occur within a year from the date of postponement.

PetroSync is not responsible for any loss or damage as a result of the cancellation policy. PetroSync will assume no liability whatsoever in the event this event is cancelled, rescheduled or postponed due to any Act of God, fire, act of government or state, war, civil commotion, insurrection, embargo, industrial action, or any other reason beyond management control.

CERTIFICATE OF ATTENDANCE

80% attendance is required for PetroSync's Certificate of Attendance.

DETAILS

Please accept our apologies for mail or email that is incorrectly addressed.
Please email us at registration@petrosync.com and inform us of any incorrect details. We will amend them accordingly.

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CHARGES & FEE(s)

- For Payment by Direct TelegraphicTransfer, client has to bear both local and oversea bank charges.

- For credit card payment, there is additional 4% credit card processsing fee.

Confirmation

I agree to PetroSync's terms & conditions,payment terms and cancellation policy.

Authorized Signature : _____

Date : _____

PAYMENT TERMS **: Payment is due in full at the time of registration. Full payment is mandatory for event attendance.**