PROJACS ACADEMY
by egis

Lean Maintenance - The Recent Trends of Maintenance

في (LEAN) تكنولوجيا تقليل الفاقد والتخلص من الاخطاء الصيانة ـ تقنية عالمية حديثة

11 – 15 December 2023

Istanbul / Turkey

Introduction

Engineers and managers working in the field of design, construction and maintenance of structures often feel the lack of a comprehensive practical guide on the practice, needs and effective programs of good maintenance. Few practical references are available that bridge the gap between theoretical, technical, practical and managerial matters in this regard.

This course is planned to answer technical questions frequently asked by the practicing engineer and the executive. It includes information about lean maintenance, new trends in maintenance and repair, employing short repairs and high productivity, self-directed work teams, the law of intelligent action, types and causes of common deficiencies of structures, workable preventive measures for the decay and deterioration of structures, maintenance work types, root cause analysis, comprehensive check list library, and the use of innovative technology and new materials.

Objectives

- To understand the causes and mechanisms leading to deficient facilities
- To workout preventive measures to counteract deterioration of facilities
- To learn about new trends in maintenance
- To explain the principles of lean maintenance
- To plan effective maintenance programs
- To understand the nature of innovative technology and new materials
- To learn about specific needs and requirements for concrete, steel and other structures
- To comprehend the role of the designer, the contractor and the supervision in producing sound structures
- To provide an overview for the role of effective management
- To provide a comprehensive check list library for maintenance jobs
- To present several case studies of effective maintenance jobs
- To learn from historical structures that stood the test of time

Who Should Attend?

This course is designed to meet the needs primarily of engineers and managers, working in the area of civil engineering construction, and facing the challenges of maintaining and preserving good, sound structures, utilities and services. It is specifically useful for engineers of any discipline, quality assurance experts, construction and supervision engineers, owners and managers of constructed facilities.

It is expected that a number of the attendees will find the information beneficial and a useful addition to their reference library even though they are not directly practicing in the field.

Course Outline

Day One

- **Road to Good Design, Construction and Maintenance Practices**
  - Why do we need the codes?
  - **The multidisciplinary design effort**
  - **Coordination problems**
  - Design – construction process
  - Structural behavior- natural vs. forced
  - Design standards and their relationship to structural performance
  - List of 100 most frequently cited OSHA construction standards
  - Technical specifications, shop drawings, document review
  - Design and construction checklists
  - Categories of building life
  - Degradation factors
  - Maintenance levels
  - Systematic maintenance programs
  - Options other than repair
  - **The uniform code for building conservation**
- **Assessment of Site Conditions**
  - Construction safety codes
  - Inspection of structures
  - Human perceptions of durability
  - Accepting undesirable existing conditions
  - Improvements in durability
  - Quality creation
  - Data acquisition, condition survey
  - Detailed inspections
  - Problem conditions requiring special consideration

Day Two

- **Maintenance and repair strategies**
  - Anatomy of surface repairs
  - Repair concepts
  - Repair approaches
  - Shoring
  - External prestressing
  - Supplemental reinforcement
  - Stress reduction

- Internal, external grouting
- Epoxy repair
- Span shortening techniques
- Different strategies
- Polymer composites

➢ **Improving the odds**

- Slabs on grade
- Joint pros and cons
- Joint worst treatment
- Joint failures
- Joint maintenance
- Wall joints – tips
- Expansion, contraction, settlement, seismic, construction joints
- Sealant complications
- Maintenance vs. repair
- Design life
- Classification of failure modes
- Insulation and water retarders
- Concrete buildings – detailing provisions

Day Three

➢ **Maintenance – The Science, Art and Philosophy**

- Maintenance interdependency
- Maintenance organization
- Maintenance program content
- Maintenance deficiencies
- Responsibilities of maintenance
- Maintenance work types
- Centralization vs. decentralization
- Self-directed work teams
- Breakdown, corrective and preventive maintenance
- The law of intelligent action
- Root cause analysis
- The five whys

Day Four

➢ **Preventive and predictive maintenance**

- Six patterns of failure
- Hidden failures
- Task list
- Failure history impact on task list

- Short repairs and high productivity
- Example of corrective action
- Pencil, panic, planned, productive and percussive maintenance
- Tighten, lubricate, clean
- Is the organization ready for predictive maintenance
- Questions to ask before you begin
- Is the organization ready for the future?
- Check list library
- **The future of structures**
- Challenges of the 21st century

Day Five

- **PM Details for Effectiveness**
  - Predictive maintenance – state of mind
  - Should this be glycol?
  - PM compliance
  - Raw PM measurement
  - PM effectiveness
  - Reasons to outsource PM
  - Reasons to stay away from outsourcing
  - Personal issues
  - Insure the PMs are done as designed
  - The future of P/PM
- **A Whole Number of Issues**
  - Value engineering
  - Peer review
  - Approval, acceptance and certification
  - Team organization
  - Changing technology
  - Innovative materials
  - Standard of care
  - Negligence per se
- **Some practical tips**

Training Method

- Pre-assessment
- Live group instruction
- Use of real-world examples, case studies and exercises
- Interactive participation and discussion
- Power point presentation, LCD and flip chart
- Group activities and tests
- Each participant receives a 7" Tablet containing a copy of the presentation, slides and handouts
- Post-assessment

Program Support

This program is supported by interactive discussions, role-play, case studies and highlight the techniques available to the participants.

Schedule

The course agenda will be as follows:

- Technical Session 08.30-10.00 am
- Coffee Break 10.00-10.15 am
- Technical Session 10.15-12.15 noon
- Coffee Break 12.15-12.45 pm
- Technical Session 12.45-02.30 pm
- Course Ends 02.30 pm

Course Fees*

- **3,200 USD**
  **VAT is Excluded If Applicable*

المقدمة

المهندسين والمديرين العاملين في مجال تصميم وبناء وصيانة الهياكل غالبا ما يشعرون بعدم وجود دليل عملي شامل عن هذه الممارسة ، والاحتياجات ووجود برامج فعالة للصيانة جيدة. سنأخذ دراسة إشارات قليلة العملية المتاحة التي من شأنها سد الفجوة بين النظرية والمسائل الفنية والعملية والإدارية في هذا الصدد.

هذا بالطبع هو المخطط للإجابة على الأسئلة الفنية المتداولة من قبل المهندسين وممارسي السلطة التنفيذية. وهو يتضمن معلومات عن صيانة الهياكل ، والاتجاهات الجديدة في مجال الصيانة والتصليح ، وتوظيف إصلاحات قصيرة والإنتاجية العالية ، والتوجيه الذاتي لفرق العمل ، وقانون العمل الذكي ، وأنواع وأسباب القصور المشتركة للهياكل والقابلة لتطبيق الاجراءات الوقائية لمنع التدهور والاضمحلال الهياكل ، وأنواع أعمال الصيانة ، وتحليل الأسباب الجذرية ، شاملة تحقق قائمة المكتبة ، واستخدام التكنولوجيا المبتكرة والمواد الجديدة.

الاهداف

- فهم الأسباب والآليات التي تؤدي إلى نقص المرافق
- تجريب تدابير وقائية لمواجهة تدهور المرافق
- معرفة المزيد حول الاتجاهات الجديدة في مجال الصيانة
- شرح مبادئ صيانة الهزيل
- تخطيط برامج الصيانة الفعالة
- كي نفهم طبيعة التكنولوجيا المبتكرة، والمواد الجديدة
- معرفة الاحتياجات والمتطلبات المحددة من الخرسانة والفولاذ وغيرها من الهياكل
- فهم دور المصمم والمقاول والإشراف في انتاج هياكل سليمة
- تقديم لمحة عامة عن دور الإدارة الفعالة
- تقديم قائمة شاملة لفحص وظائف المكتبة الصيانية
- أن يقدم العديد من دراسات الحالة من وظائف الصيانة الفعالة
- لمعرفة أنواع الهياكل التاريخية التي صمدت أمام اختبار الزمن

الحضور

تم تصـميم هذه الدورة لتلبية احتياجات المهندسـين والمديرين في المقام الأول، العاملين في مجال إنشـاءات الهندسـة المدنية، ومواجهة تحديات صـيانة والحفاظ على الهياكل والمرافق والخدمات الجيدة والسـليمة. وهو مفيد بشـكل خاص للمهندسـين من أي تخصـص، وخبراء ضـمان الجودة، ومهندسـي البناء والإشـراف، وأصحاب ومديري المرافق المشيدة.

ومن المتوقع أن يجد عدد من الحضـور المعلومات مفيدة وإضـافة مفيدة لمكتبتهم المرجعية على الرغم من أنهم لا يمارسون هذا المجال بشكل مباشر.