Strategic Airport Pavement Management and Maintenance Training Course

Ref: #AIR9873

Course Introduction / Overview:

This comprehensive training course provides an in-depth exploration of the principles and practices essential for the effective management and maintenance of airport pavements. In an industry where safety and operational efficiency are paramount, the integrity of runways, taxiways, and aprons is non-negotiable. This program, offered by BIG BEN Training Center, is meticulously designed to equip professionals with the skills to implement robust Airport Pavement Management Systems (APMS). We will delve into the foundational concepts of pavement design, material science, and distress identification, guided by the pioneering work of experts like Dr. M. Y. Shahin, whose development of the Pavement Condition Index (PCI) revolutionized the field, as detailed in his seminal work "Pavement Management for Airports, Roads, and Parking Lots". Participants will move beyond theory to master practical techniques for pavement evaluation, non-destructive testing, and the selection of optimal maintenance and rehabilitation strategies. The course emphasizes a data-driven approach, focusing on life-cycle cost analysis and budget optimization to ensure the longevity and reliability of critical airport infrastructure, aligning with international standards set by bodies such as the FAA and ICAO. This is a definitive guide for professionals seeking to master airport pavement engineering from A to Z.

Target Audience / This training course is suitable for:

- Airport Engineers and Planners.
- Pavement Maintenance Managers and Supervisors.
- Airfield Operations and Maintenance Staff.
- Civil Engineering Consultants specializing in aviation.
- Project Managers overseeing airport infrastructure projects.
- Regulatory and Compliance Officers.
- Asset Management Professionals in the aviation sector.
- Military Engineers responsible for airfield pavements.

Target Sectors and Industries:

- Airport Authorities and Operators.
- Civil Aviation Authorities and Regulatory Bodies.
- Governmental Agencies and Ministries of Transport.
- Military and Defense Aviation Commands.
- Civil Engineering and Construction Firms.
- Aviation Consulting and Advisory Services.
- Ground Handling and Airport Service Companies.

Target Organizations Departments:

- Engineering and Infrastructure.
- Maintenance and Repair Operations.
- Asset Management and Planning.
- Safety, Quality, and Compliance.
- Airside Operations.
- Project Management Office.
- Procurement and Contracts.

Course Offerings:

By the end of this course, the participants will have able to:

- Conduct thorough pavement distress surveys and calculate the Pavement Condition Index (PCI).
- Develop and implement a comprehensive Airport Pavement Management System (APMS).
- Differentiate between various pavement failure modes for both flexible and rigid pavements.
- Select appropriate maintenance, preservation, and rehabilitation strategies based on pavement condition.
- Utilize non-destructive testing (NDT) data for structural evaluation of pavements.
- Perform life-cycle cost analysis (LCCA) to optimize maintenance budgets and planning.
- Ensure compliance with FAA and ICAO standards for pavement design and maintenance.
- Manage specialized maintenance tasks such as rubber removal, joint sealing, and airfield markings.
- Evaluate the use of sustainable materials and new technologies in pavement construction and repair.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to foster a dynamic and engaging learning environment that bridges theory with real-world application. This course adopts a blended learning approach, combining expert-led presentations with highly interactive sessions. Participants will benefit from detailed case studies of pavement projects from international airports, allowing them to analyze successes and failures in a controlled setting. A significant portion of the training is dedicated to hands-on workshops and practical exercises, where attendees will work with pavement distress data, practice PCI calculations, and develop sample maintenance plans. Collaborative group discussions and problem-solving activities are central to our approach, encouraging participants to share their unique experiences and challenges, thereby enriching the learning process for all. Our instructors facilitate a continuous feedback loop, ensuring that complex engineering and management concepts are thoroughly understood. The focus is on equipping participants with tangible skills and actionable strategies that can be immediately implemented to improve pavement performance and optimize asset management within their respective organizations.

Course Agenda (Course Units):

Unit One: Fundamentals of Airport Pavement Engineering

- Introduction to airport pavement types: flexible, rigid, and composite.
- Pavement materials: asphalt, concrete, aggregates, and additives.
- Principles of pavement structural design and analysis.
- The Aircraft Classification Number/Pavement Classification Number (ACN/PCN) method.
- Overview of international regulatory frameworks: FAA and ICAO standards.
- The role of an Airport Pavement Management System (APMS).
- Environmental factors affecting pavement performance.

Unit Two: Pavement Condition Assessment and Evaluation

- Pavement distress identification for asphalt and concrete surfaces.
- The Pavement Condition Index (PCI) survey methodology in detail.
- Conducting visual inspections and manual data collection.
- Introduction to automated pavement condition survey technologies.
- Non-Destructive Testing (NDT) techniques for pavements.
- Using the Falling Weight Deflectometer (FWD) for structural analysis.
- Interpreting NDT data for pavement evaluation and load-bearing capacity.

Unit Three: Pavement Maintenance and Rehabilitation Strategies

- Developing a proactive pavement preservation program.
- Routine maintenance techniques: crack sealing, patching, and spall repair.
- Preventive maintenance for flexible pavements: seal coats and overlays.
- Preventive maintenance for rigid pavements: joint sealing and slab stabilization.
- Pavement rehabilitation and reconstruction options.
- Material selection for effective and durable repairs.
- Quality control and quality assurance in pavement maintenance projects.

Unit Four: Airport Pavement Management Systems (APMS)

- Core components and architecture of an effective APMS.
- Pavement inventory and database management.
- Performance modeling and prediction of pavement deterioration.
- Developing maintenance and rehabilitation (M&R) plans.
- Life-Cycle Cost Analysis (LCCA) for decision-making.
- Budget optimization and multi-year work planning.
- Software tools and technologies for APMS implementation.

Unit Five: Advanced Topics and Future Trends in Pavement Management

- Managing special pavement issues: rubber removal and hydroplaning.
- Maintenance of airfield markings and paint systems.
- Pavement management during winter operations: de-icing and anti-icing.
- Sustainable pavement solutions and recycled materials.
- The impact of new large aircraft (NLA) on pavement infrastructure.
- Introduction to smart pavements and sensor technologies.
- Developing a comprehensive airport pavement safety and risk management plan.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

Considering the increasing weight of new-generation aircraft and the push for sustainable materials, how must traditional pavement life-cycle cost analysis models evolve to remain effective for future airport planning?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself through its holistic and pragmatic approach, seamlessly integrating the technical engineering aspects of pavement design with the strategic principles of asset management. Unlike programs that focus narrowly on either theory or maintenance techniques, this training provides a complete 360-degree view of the pavement lifecycle. We place a strong emphasis on data-driven decision-making, moving beyond simple distress identification to teach participants how to leverage tools like the Pavement Condition Index (PCI) and Life-Cycle Cost Analysis (LCCA) for budget optimization and long-term planning. The curriculum is built around real-world case studies from diverse international airports, providing practical insights into compliance with FAA and ICAO standards that are directly applicable in the workplace. Furthermore, the course content is forward-looking, addressing contemporary challenges such as the impact of new large aircraft, the adoption of sustainable materials, and the integration of modern Airport Pavement Management System (APMS) software. Participants leave not just with knowledge, but with a strategic framework for developing proactive, cost-effective, and compliant pavement management programs that enhance airport safety and operational longevity.