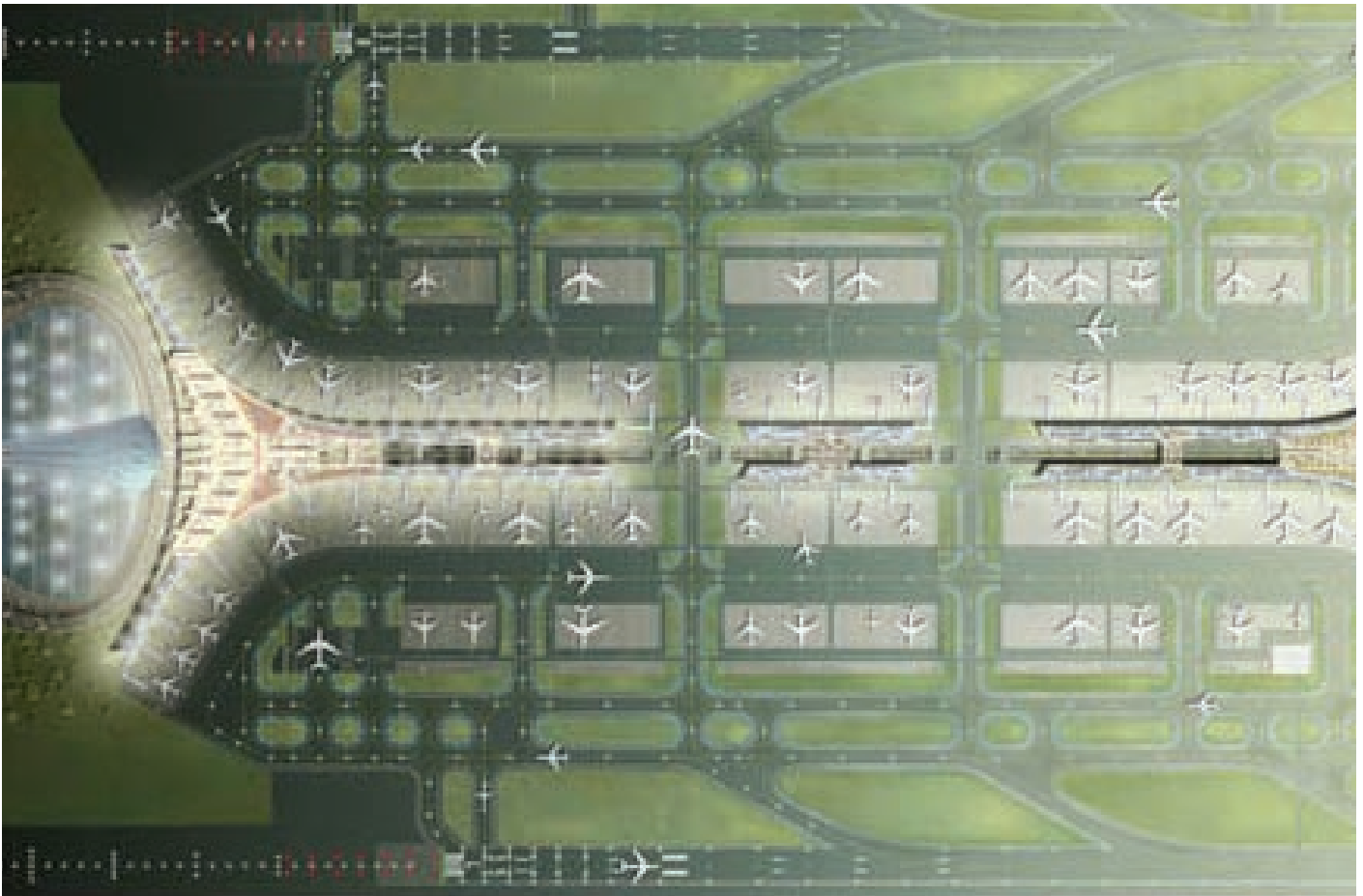


Beijing Airport Automated People Mover (APM) System



PROJECT DETAILS



Applications:
Electric Heat Tracing for an Automated People Mover (APM) System



Technology:
Raychem Skin-effect Tracing Systems (STS) and series-resistance heating systems



Location:
Beijing, China



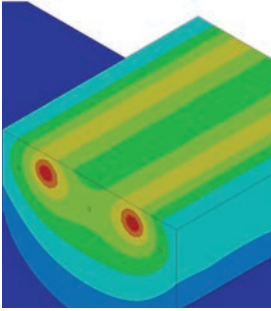
Date:
December 2007



Contract Scope:
Finite Element Analysis to predict thermal profile of the Guideway running surface; Engineering and Procurement for the Electric Heat-Tracing; Associated Components; Control & Monitoring systems; Transformers



Raychem Series Resistance heating cables provide the ideal solution for rail segments such as turntables and switches.



Finite Element Analysis to Rail & Guideway projects helps ensure that sufficient heat is provided for effective snow and ice melt capability.



KEY CHALLENGES

This project required over 48 kilometers of heat tracing to prevent snow and ice from forming on the guideway and associated running surfaces of a new Automated People Mover (APM) system for Beijing airport. This APM system was part of the airport's extensive expansion program in preparation for the 2008 Olympics being held in Beijing, China. Specific challenges inherent to this type of project included the extremely long running surfaces associated with the guideways and tight clearances and configurations as seen in the rail, switch and turntable applications. Raychem's TRACER Turnkey Solutions team provided a final system design that incorporated heat-tracing systems of various technologies to address these issues.

The largest engineering challenge with this project lay in the design of the Raychem Skin-effect Tracing System for the concrete guideways. By developing and utilizing specialized component assemblies, we were able to design a system with long continuous circuits, averaging over 1000 meters in length. Other unique components and assemblies were employed in the design to provide an overall solution that was not only cost-effective but also highly reliable because it eliminated the need for hundreds of circuits, which would have been required using other heat-tracing technologies.

SOLUTION

A suite of Raychem products was installed to keep snow and ice from forming on the guideway and associated running surfaces of a new Automated People Mover (APM) system for the Beijing Airport. Bombardier, acting as the prime contractor for the Beijing Airport, contracted Raychem's TRACER Turnkey Solutions team to provide all engineering, design and products for the integrated heating system — a system designed and based on predicted heat requirements and thermal profiling of the guideway running surface. We performed a Finite Element Analysis (FEA) to predict the heat requirements and snow-melting characteristics under varying conditions. A total of eleven case studies were submitted using historical data on Beijing's snowfall and temperature averages over the past 100 years. This information was used to establish and implement operating philosophies for the customer to allow for the most suitable and energy efficient heating system solution.

PRODUCTS

Raychem Skin-effect Tracing Systems and series-resistance heating systems, and ancillary components; Raychem Control & Monitoring systems; Transformers.

BENEFITS

- Developing and utilizing specialized component assemblies allowed Raychem to provide an overall solution that was not only cost-effective but also highly reliable because it eliminated the need for hundreds of circuits, which would be required using other heat-tracing technologies.
- The Finite Element Analysis (FEA) to predict the heat requirements and snow-melting characteristics under varying conditions is used to establish and implement operating philosophies that let's the client run the most suitable and energy efficient heating system solution.

In cold weather climates, APM System running surfaces, such as guideways, power and signal rails, switches, and turntables, require de-icing for safe operation. Raychem's Tracer Turnkey team can engineer heat-tracing systems to accommodate the most unique aspects of these applications, including embedded guideways and tight clearance and configuration areas as seen in rails, switches and turntables.

Raychem Skin-effect Tracing Systems (STS) generates heat on the inner surface of a ferromagnetic heat tube that is thermally embedded into the concrete guideway to be heated. STS systems are custom engineered to minimize the number of power supply points required.

The Raychem heating systems are flexible, providing ease of installation. They are also suitable for longer circuit lengths and for continuous exposure temperatures of up to 260°C.

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