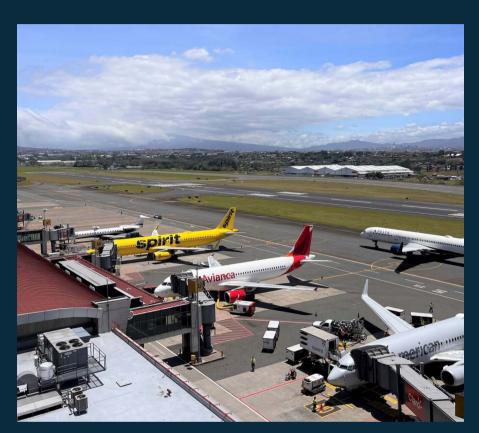# Ensuring safety and efficiency in tropical conditions at Costa Rica's airports

VAISALA

Case Study

The client:

The Civil Aviation Authority of Costa Rica

Vaisala solution:

Vaisala AviMet Runway Visual Range system
Vaisala Forward Scatter Sensor FD70

THE CHALLENGE:

In Costa Rica, the tropical climate shifts between dry and rainy seasons. During the rainy season, high humidity can reduce visibility to as low as 100 meters. This creates serious challenges for airports, especially the main airport - Juan Santamaria - which lies between the Pacific and Atlantic Oceans. The visibility here often changes quickly, making it difficult to manage flight operations.

When visibility drops, flights can't safely take off or land, forcing delays, disruptions, and aircraft to circle. Pilots and air traffic controllers must act fast and make confident, accurate decisions, but to do so, they need access to precise, real-time data.

Until now, airports in Costa Rica have relied on human observers to measure Runway Visual Range (RVR). However, this method has limitations: not only is it impractical to have staff on runways, training is difficult, and measurements are less accurate. When the airports experienced staff shortages during COVID-19, it became clear that they needed to modernize by bringing in automated systems that ensure smoother, more reliable operations.

> *"The RVR system is indispensable.
> It provides continuous and reliable
> data, which is crucial for making
> quick decisions about visibility
> changes at the airport. This system
> has significantly improved safety
> and operational efficiency at Juan
> Santamaría International Airport"*
>
> *Evelyn Quiros Badilla*
> *Meteorologist, Civil Aviation Authority of Costa Rica*

THE APPROACH:

The Civil Aviation Authority installed Vaisala's
FD70-based RVR system at Juan Santamaría
International Airport, selecting it for its accuracy,
reliability, and low-maintenance design.
These qualities were essential for providing
uninterrupted visibility monitoring, particularly
during busy periods or when staffing levels
were limited.

The automated system works alongside human
observations to deliver around-the-clock visibility
data, even under the most challenging conditions.
Its real-time reporting allows airport staff to make
quick, informed decisions to maintain safety and
efficiency during rapidly changing weather.

To maximize the system's effectiveness,
Vaisala conducted comprehensive training
for the airport's technical team. This training
covered both daily operations and long-term
maintenance, ensuring the system could be used
reliably and sustainably over time.

THE RESULTS:

Juan Santamaría Airport has taken a major step
forward by implementing Vaisala's FD70 system.
This advanced technology provides continuous,
reliable visibility data, ensuring smoother and
safer operations, even in Costa Rica's challenging
weather conditions. In a country where tourism
drives the economy, maintaining efficient and
comfortable air travel is critical.

The FD70 system enhances airport operations
by delivering automatic, real-time RVR
measurements. This data has been helping
airport staff to make more confident decisions
during adverse weather, such as determining
when to reopen runways or avoid costly flight
diversions. The ability to instantly assess and
respond to changing visibility keeps the airport
operational and minimizes disruptions.

Access to both real-time and historical visibility
data has significantly improved scheduling
at Juan Santamaría. For example, the airport
can now shift busy flights from low-visibility
afternoons to clearer morning slots, reducing
delays and improving the travel experience. This
data-driven approach ensures more efficient
operations while prioritizing passenger comfort
and safety.

The FD70 system delivers consistent
performance, integrates seamlessly with other
sensors and human observers, and requires
minimal maintenance. Its adaptability to sudden
weather changes has made it an essential part
of the airport's infrastructure. By reducing
downtime and ensuring operational continuity,
the system supports Costa Rica's critical tourism
sector while setting new standards for airport
efficiency and safety.

Why Vaisala?

For over 45 years, Vaisala has been a pioneer
in aviation weather technology, ensuring
that every measure is taken for unparalleled
safety, efficiency, and sustainability.

Our gold standard suite of solutions is
trusted in more than 170 countries and
over 2000 airports globally. In fact, every
commercial f light around the world will use
weather observations produced by Vaisala
equipment or forecasts driven by our sensor
measurements at some point in their journey.

With a commitment to constantly evolving
our portfolio, Vaisala remains at the forefront
of the industry, continuously exploring
new horizons.

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