IMS4 ARWIS
Airport Runway Weather Information System

Real-time data, forecasts and early warnings
IMS4 ARWIS provides the airport authorities with the essential runway surface condition data. Using real-time collected measurements from the field sensors as well as forecasts from the integrated model the system detects and predicts the runway conditions: ice (black ice), freezing rain, accumulation of snow and thaw.

The measurements and forecasts-based early warnings contribute to air traffic safety and help in planning the runway maintenance activities. The system can be installed as standalone with options of upgrades during the system lifetime or can be fully integrated within the IMS4 Automated Weather Observation System.

**FEATURES:**

- Detection and prediction of runway conditions
- Alarms on hazardous phenomena detected or forecast
- Effective de-icing
- Intrusive as well as non-intrusive sensors
- Multiple sensor interfaces (modem, fiber optic, wireless)
- Standalone system or integrated within AWOS/AWDSS
- Runway condition data on the Net

**Field Sensors**

The IMS4 ARWIS can interface numerous types of sensors and data loggers. The active/passive intrusive runway surface and subsurface sensors or non-intrusive optical sensors provides runway and subsurface temperature, freezing point, water film thickness and runway condition (dry, damp, wet, residual salt, freezing wet, ice, black ice etc.). The optional automatic weather stations are measuring air pressure, wind speed and direction, temperature/dew point, present weather, precipitation (indicator and amount), snow depth and the system is open for measuring and processing of the other quantities, if needed.
Airport Runway Weather Information System
System scheme and system components

With modularity and scalability in the mind, the system can be easily adapted to the existing airport communication infrastructure and allows adding of the sensors and data loggers when the expanding operations need them.

- Interfaces to the various sensors and data loggers: RS232/422/485, fiber optic, TCP/IP, wireless
- Numerous input data formats supported (raw text/binary, XML)
- Quality control: data format validation, BITE data evaluation, verification of measured data

**IMS4 ARWIS Server**
Standard COTS server or a dual hot failover cluster, the IMS4 ARWIS server collects the measurements, performs the validations and recalculations, distributes data to the displays and 3rd party systems and runs the runway condition model.

**Forecasts and early warnings**
For the runway condition prediction, IMS4 ARWIS provides interfaces to the NWP model (deployed by MicroStep-MIS or operated by the airport/local met service) and the IMS4 ARWIS built-in runway condition model provides the nowcasts (3-6 hour forecasts) and 12-hour predictions of the air and runway temperature and runway conditions for all system locations.

The factory configured set of the prioritized alarms alerts the operators upon the detection of hazardous phenomena or (taking the forecasts into account), issues the early warnings even in case of the possible approaching hazard, thus giving the maintenance staff time to act proactively. The alarm set is fully user configurable to make the runway maintenance cost-effective without safety compromises.

**ARWIS Displays**
Customizable displays report the runway data and warning status for the multiple runways/multiple locations along the runways in accordance with the respective airport authority requirements. The trend graphs displays both measured and forecast data. The built-in aviation web server provides the local airport controllers as well as remote users with the powerful and efficient web interface.
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System components

**Integrated part of the Aviation Weather Decision Support System**
IMS4 ARWIS with its built-in runway condition forecast model make the integral part of the Aviation Weather Decision Support System.

**IMS4 application software platform**
IMS4 ARWIS benefits from the long term development of the IMS4 application software:

- Built-in web and application server: an authorized user has access to all data, statistics and full functionality from any computer on the LAN/WAN/internet/VPN.
- Configuration wizards: web-based interface to the configuration data stored as XML files or database records. Station/sensor/variable metadata, communication settings, maintenance activities – all is easily configurable using menus, drop-down lists or standard textboxes.
- Security: The built-in security mechanisms provide user-configurable tools for limiting user access to particular system modules, stations or channels according to the permissions related to user names, user roles or IP addresses of remote users.

**System requirements**
- Standard server or a dual hot-failover cluster
- Linux or Microsoft Windows 7/Server 2008 operating system
- Mozilla Firefox compatible browser supported
- ISO 9001:2008 for quality assurance

**Compliance with standards**
- CAA Certified (Type approval, applicable standards)
- ICAO Annex 3 and 10 for Data Processing and Reporting Practices
- ICAO Annex 14 Aerodrome Design and Operations
- ICAO Doc 8896 for Aeronautical Meteorological Practices