Analysis of EGPWS Smart Landing Taxiway Alert Incident, San Francisco (KSFO) – July 7th, 2017

Rev: A 04-12-2018

EGPWS Smart Landing Simulation Analysis

The following parameters from a QAR were provided by the NTSB in order to run a simulation of Honeywell's EGPWS Smart Landing Taxiway Landing alert.

- Time (hh:mm:ss)
- Latitude (deg)
- Longitude (deg)
- Pressure Altitude (ft)
- Altitude Radio #1 (ft)
- Indicated Airspeed (kts)
- Ground Speed (kts)
- Heading (deg)
- Drift Angle (deg)
- Pitch (deg)
- Roll (deg)
- Glide Slope Dev #1 (dots)
- Glide Slope Dev #2 (dots)
- Localizer Dev #1 (dots)
- Localizer Dev #2 (dots)
- Gear Select Down
- Gear Select Up
- Flaps Cfm Engines (deg)
- Engine #1 EPR Actual
- Engine #1 N1 Actual (%RPM)
- Engine #2 EPR Actual
- Engine #2 N1 Actual (%RPM)

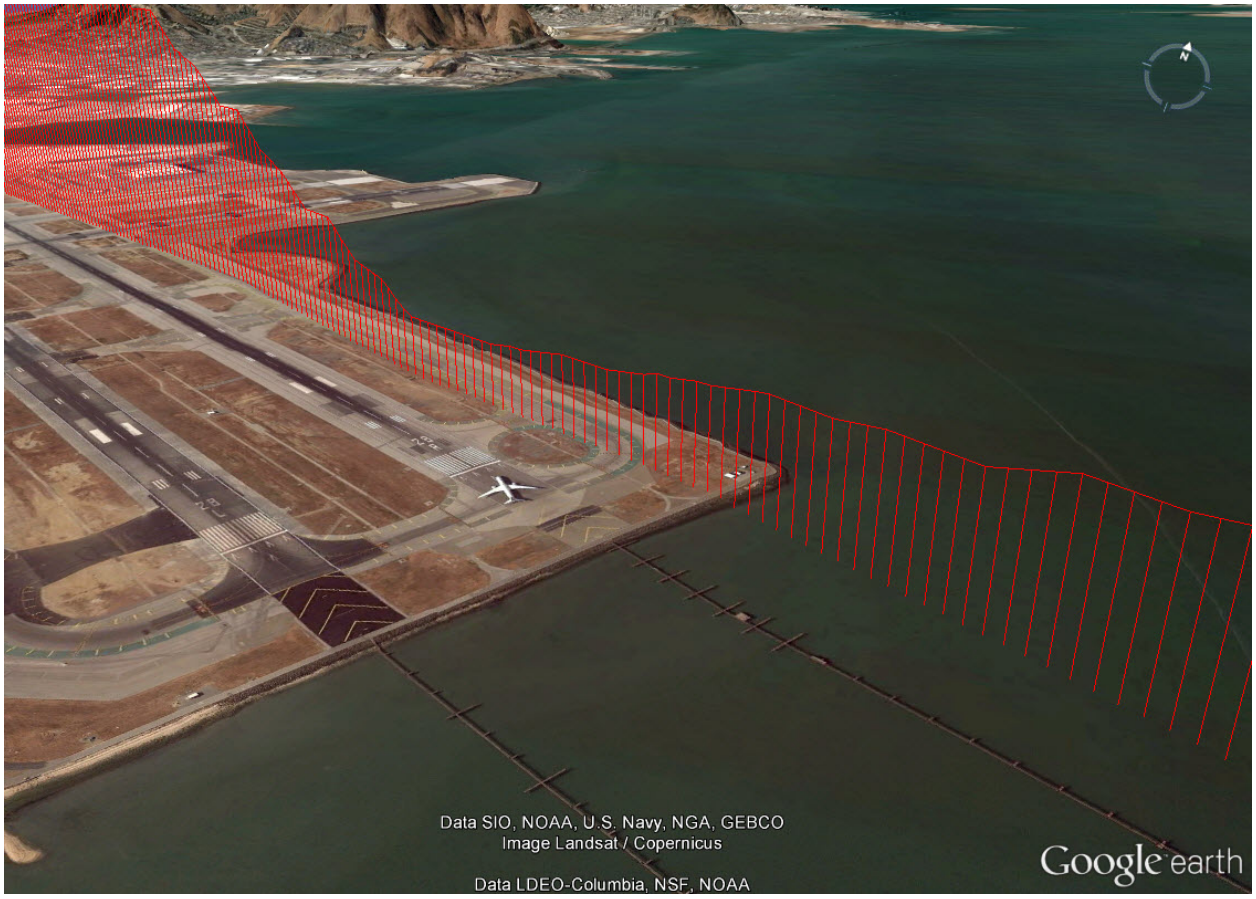
Parameters that were recorded less frequently than 250 ms intervals were linearly interpolated. The following parameters were necessary to run the EGPWS Smart Landing simulation but were not available in the QAR original data. These necessary simulation parameters were derived using other available information.

- True Track (derived from Magnetic Heading, Drift Angle and Magnetic Variation)
- True Heading (derived from Magnetic Heading and Magnetic Variation)
- Vertical Speed (derived from rate of change of Pressure Altitude)

Additional simulation assumptions and limitations are as follows:

- The QAR recorded latitude and longitude information are from GPS data (or are updated by GPS)
- The QAR latitude and longitude data did not include the precision that the GPS can provide (latitude fine and longitude fine).
- The QAR recorded longitude data appeared to suffer data synchronization issues resulting in large steps. Therefore, the aircraft position data was linearly extrapolated when an unreasonable jump was detected.

A simulation was run using a Honeywell EGPWS MK-V (P/N 965-0976-003-236-236) in the Honeywell lab in Redmond, WA. For this simulation, the taxiway landing alert threshold was set to the default 250 ft radio altitude.



EGPWS Smart Landing Simulation Result

Based on the limitations and assumptions provided above, the results of the simulation were as follows :

The EGPWS Smart Landing issued a "**Caution Taxiway Caution Taxiway**" alert at 235 feet radio altitude, which is approximately 0.5 NM from Runway 28R threshold.