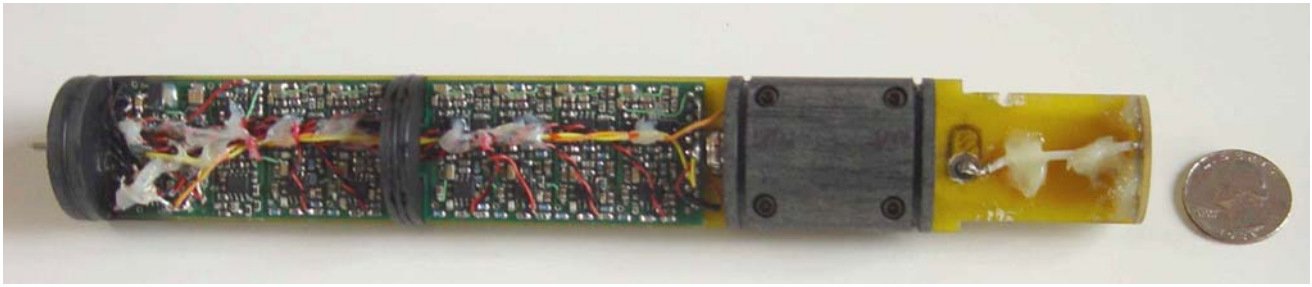
Innovative Dynamics Communiqué

Spring 2005 Newsletter

Innovation working for you…



Wireless Transmitter for Turbine Engine Health Monitoring
(see Item 2)

Contents

1 ITS IN SAN FRANCISCO

Joseph Gerardi, our President and CEO will attend the 12th World congress on Intelligent Transportation Systems (ITS), which will be held in San Francisco November 6 through 10, 2005. He will be presenting a paper on Road Hazard Information Systems. The 2005 theme: "Enabling Choices in Transportation," communicates the emphasis on the end-user in transportation.

The World Congress on Intelligent Transportation Systems (ITS) is the world's largest annual event focusing on technology solutions for improving transportation systems. Participants represent a range of transportation professionals and public officials who create vehicles, roads, businesses and communities around safe, reliable, efficient transportation systems. They attend the World Congress to learn about the latest innovations, to see the newest products and services and to connect with colleagues and industry leaders from around the world. California here I come!---Bon voyage to Joe!!

2 PRODUCT NEWS – Wireless Transmitter— A self powered multi-channel wireless transmitter for remote measurement of temperature, strain, and acoustic information on rotating machinery. 200 kHz BW transmitter also available. Up to 100 ft. range. (See picture- front page). For information on how we can adapt this cutting edge product to your application, call us at 607-257-0533.

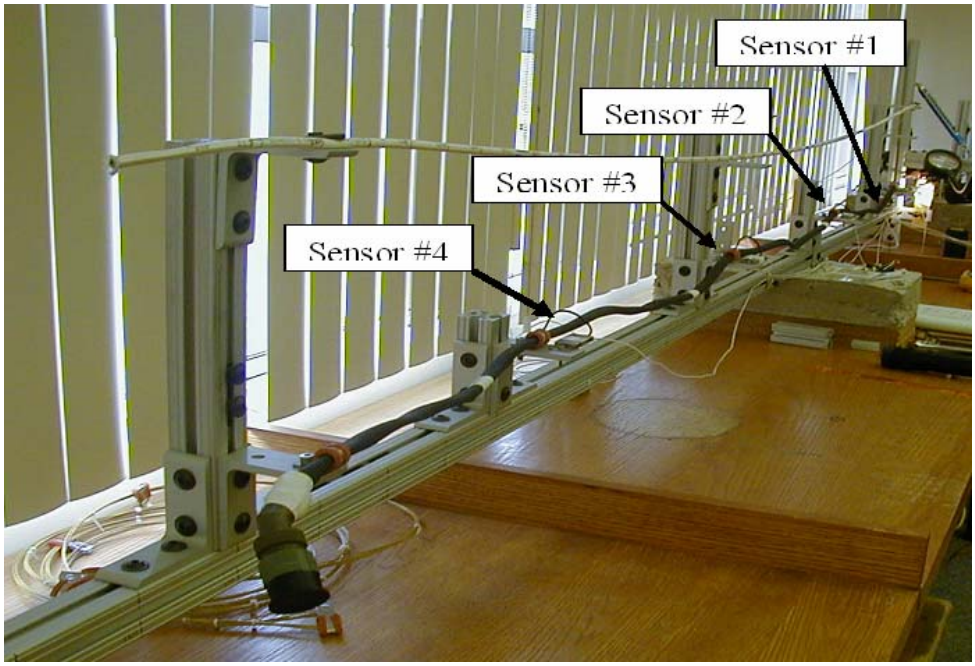
3 ABOUT US

Innovative Dynamics is a 15 person research and development firm located in Ithaca, NY comprised of mechanical, electrical and computer engineers. IDI develops intelligent sensor systems for improved aircraft and ground vehicle safety. These state-of-the-art products are aimed at improving the overall safety of transportation systems with consequent savings in human life and reduction in capitol loss. Our research is supported by laboratories and test facilities for work in advanced materials, electronics, optics, sensors, mechanical systems, structures, and signal processing. IDI has developed numerous innovative applications of its technology under contracts from various government customers through Small Business Innovative Research (SBIR) grants, state-sponsored research, and private companies, with a broad array of applications to the transportation industry. For further information about our innovative products, please contact us at 607-257-0533.

4. CONTRACT NEWS– Embedded Wiring Diagnostic Technologies for Aircraft

Innovative Dynamics, Inc. is developing a Wire Health Management System (WHMS) that provides prognostic and diagnostic tools for detecting, identifying, and locating wire faults. The expected result for the Navy is substantially reduced maintenance costs and down time of aging aircraft. This work is being sponsored by the NAVY SBIR Program at Patuxent River, MD.

The proposed WHMS incorporates multiple sensors into “smart” clamps to monitor wire chafing and arcing events that account for more than 50% of wire fault incidents. The sensors can also be used to detect loose connections, temperature increases indicative of fire or other wire anomalies, fluid contamination, and connector cross-mating to cover 80-90% of all wire incidents. Smart components also provide the capability to mitigate unwanted wiring vibration through active noise cancellation techniques, and thus extending life of key wiring components. All can be configured to be non-intrusive fault indicators such that nothing needs to be disconnected or dismantled to conduct the inspection. The system operates continuously in-flight so that mystifying intermittent conditions can be identified as they happen. The system can also be used for ground inspections as well. IDI is developing a comprehensive implementation plan for new and legacy aircraft covering installation through end use.



Chafing Simulation Test Rig at IDI

5 OASIS IN THE DESERT - Jet engine testing at China Lake California

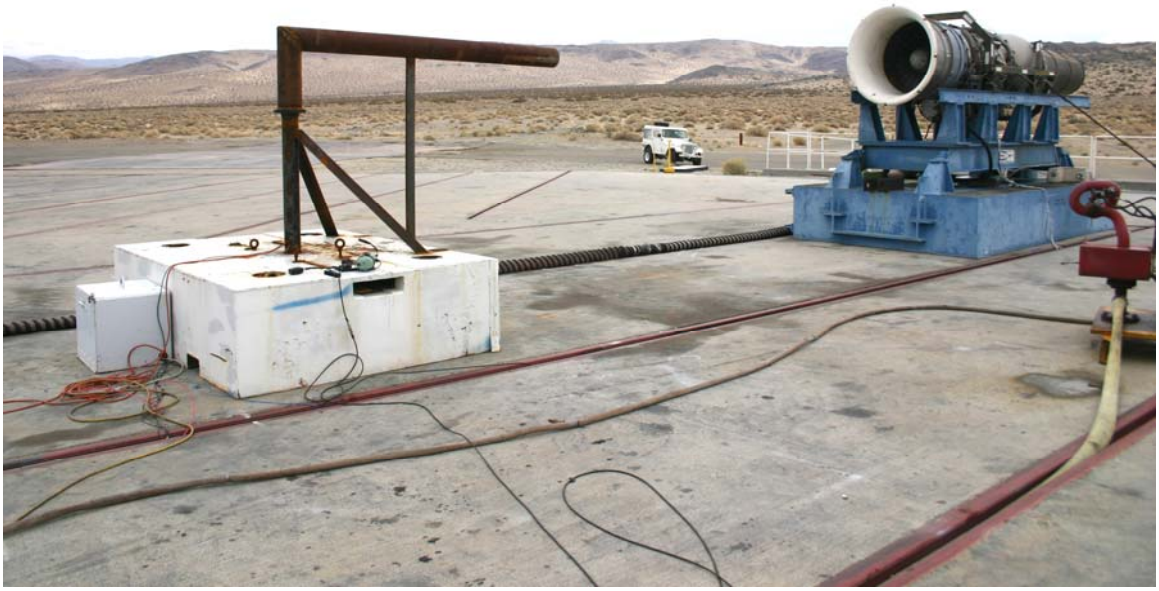
The Mojave Desert is home to several military test ranges, including the Naval Weapons Center at China Lake. With only four inches of precipitation per year, the 'lake' is dry. So is the Mojave River. The flat, arid expanse is ideal for outdoor testing. Engine testing is an outdoor activity that requires a large clear area surrounding the test pad for safety in the event of catastrophic engine failure.

For the past two years, Innovative Dynamics has participated in an FAA-led program, along with NASA and the NAVY, to research uncontained engine failures. This program will lead to improved engine design, safer operation, and more economical and effective engine maintenance.

Innovative Dynamics developed unique wireless sensor technology for monitoring rotating components. For one series of tests, we instrumented a fan disk with crack sensors and acoustic emission sensors (a growing crack can make ultrasonic noise). For tests conducted in October-November 2004, we monitored a set of strain sensors and thermocouples. IDI's Senior Scientist Jack Edmonds traveled to China Lake to conduct the tests.

The engine test setup is shown on next page. The engine is mounted on a 44,600 pound concrete block and is secured to the test pad via one-inch steel cables. (See photo below.) The wireless transmitter resides in the center of the nose cone at the front of the engine and rotates with the fan disk assembly. IDI's wireless receiver is installed in the pipe rig facing the engine 20 feet away. The receiver connects to the data recording and analysis computer located in a safety hut beneath the test pad. The roads are closed and no personnel are allowed within a mile of the test pad during engine tests. Engine operation is remotely controlled.

Test data collected in these and future tests will characterize turbine engine failure morphology.



Test Site at China Lake

If you would like to discuss how IDI's Wireless Technology can help you in your application, contact Jack Edmonds at 607-257-0533.

6 WINTER'S SHADOWY DANGER: BLACK ICE (from an article by James Brewster, National Weather Service, Binghamton)

Picture yourself driving on a familiar road; the one you've literally driven thousands of times. You practically know the layout of every turn, hill, and maybe even how many jolting potholes you encounter on your journey. But, during the cold season, treacherous icing conditions can form and lay hidden in your unsuspecting path. The possibility of detection is very small, and usually comes too late. Glaze, commonly known as "black ice," contributes to tens of thousands of automobile accidents, and associated deaths and injuries, every year throughout the US. It is considered to be the most significant wintertime danger to transportation.

Simply put, black ice is a thin formation of ice that occurs when water freezes on a road surface. Because it is so thin and clear, the dark underlying road surface easily shows through, lending to its common name. IDI's remote infrared sensor (Ice Sight) can help drivers with these hazardous conditions on the road. Think of the prevention that can occur with the implementation of Ice Sight to warn

drivers of the dangers ahead! Please see next item for more information on this innovative product.

7 IDI'S ICESIGHT

IDI's Road Hazard Warning System (ICESIGHT) is shown in photos on next page, as installed on I-695 in West Syracuse. The system uses an infrared laser system to scan the road surface for snow, ice, flooding, and low visibility (fog). The system also has the ability to obtain temperature, wind gust information, and a video image of the surroundings. The system is automated such that the current condition is posted to an internet web page with a current photo every hour. Data is transmitted to the WWW via a cellular modem. The entire system is solar powered.

IDI ran its first successful test this winter, and data is automatically plotted and compared with NOAA weather data on an internal IDI network. IDI is looking to install several more of these systems in the Syracuse area this year as part of the Federal ITS initiative.

Pictures of ICESIGHT installation on I-695 in Syracuse

Optical Camera mounted approximately 30' above road surface. Camera installed behind Solar Panels.

IR Laser Beam is focused on Bridge Deck Surface.

For more information about IDI's ICESIGHT, contact us at 607-257-0533.

8 Cruise Control Alert!!

A 36 year old female had an accident several weeks ago and totaled her car. A resident of Kilgore, Texas, she was traveling between Gladewater &Kilgore. It was raining, though not excessively, when her car suddenly began to hydroplane and literally flew through the air. She was not seriously injured but very stunned by the sudden occurrence!

When she explained to the highway patrolman what had happened he told her something that every driver should know -NEVER DRIVE IN THE RAIN WITH YOUR CRUISE CONTROL ON. She had thought she was being cautious by setting the cruise control and maintaining a safe consistent speed in the rain.

But the highway patrolman told her that if the cruise control is on and your car begins to hydroplane -- when your tires loose contact with the pavement your car will accelerate to a higher rate of speed and you take off ! like an airplane. She told the patrolman that was exactly what had occurred. We all know you have little or no control over a car when it begins to hydroplane. You are at the mercy of the Good Lord. The highway patrol estimated her car was actually traveling through the air at 10 to 15 miles per hour faster than the speed set on the cruise control.

The patrolman said this warning should be listed on the drivers seat sun-visor - NEVER USE THE CRUISE CONTROL WHEN THE PAVEMENT IS WET OR

ICY, along with the airbag warning. We tell our teenagers to set the cruise control and drive a safe speed-but we don't tell them to use the cruise control only when the pavement is dry.

The only person the accident victim found who knew this (beside! s the patrolman) was a man who had a similar accident, totaled his car and sustained severe injuries. If you send this to 15 people and only one of them doesn't know about this, then it was all worth it. You might have saved a life.

IDI has developed a Road Surface Condition Information System to prevent this kind of thing from happening. Our system emits a laser beam to look at the road surface in front of the car and uses an infrared detector to read the backscatter of the light from the surface. Upon seeing standing water or black ice, we turn off the cruise control and adjust the anti-lock brakes so that the car does not go unstable. *RCIS,* as our unit is called, is a vehicle or trailer mounted unit that senses road surface conditions and provides an indication to caution drivers of hazardous road surface or weather conditions. The detector can be pointed at a specific location on the road surface, at a range of distances and angles.

For more information on this innovative new product, please call us at 607-257-0533.

A publication of:
Innovative Dynamics, Inc.
Edited by Jeannette Edmonds

If you enjoy our free newsletter, and know of someone else who might benefit from it, please feel free to forward this newsletter to them.