ERGO 360

ERGO 360, or Energy Resource Graphical Overlay, is a geospatial information multitool. Its ultimate purpose is to allow pilots to make faster, better, decisions during asset critical scenarios. Here is a detailed look at why ERGO was created, what it does and how it can be a meaningful tool in your operation.

Why ERGO 360 Was Created
Today's pilots face an environment that increases in complexity by the day. Flight, on a good day, is a complicated enterprise. On a bad day, a pilot's ability to act decisively is a matter of life or death. There is a lot that can go wrong, and everyone on board is counting on the flight crew to have solutions when it does. This monumental task is compounded by an entire library's' worth of regulations, procedures, charts, checklists, policies, circulars, advisories, all topped off with logarithmically increasing volumes of air travel. Today, the expectations placed on flight crews regarding technical and policy related expertise push the limits of human cognition.

ERGO 360 is purposed first and foremost as an instrument which simplifies the response process during an oxygen contingency by reducing task saturation. ERGO 360 was conceived by seasoned professional pilots, designed specifically to increase their efficiency in some of the most difficult scenarios a pilot might encounter.

What Does ERGO 360 Do?
The human mind is an amazing thing. Our ability to create and grow is conceivably without limit. However, we have evolved in ways that bring disadvantages in a world of rapidly changing technology. ERGO 360 was built to address one of the most prevalent of these limitations: conceptualizing quantitative dilemmas and converting them into qualitative solutions.

To give an example of this phenomena: Let's say you were to meet a person for the first time at a sporting event held in a stadium filled with exactly 112,132 people. If you were to spend an hour with this individual, leave the sporting event and then meet them a month later in that same stadium, chances are you would be able to identify this individual again. This is because we are well evolved to making accurate assessments based on a spectrum of qualitative values such as facial features, height, gender, etc. However, if you were asked to look at that same stadium for an hour and, using only your own senses, deduce the specific number of people in said stadium, you would most likely be unable to do so with any degree of accuracy.

It is well documented, that beyond a certain point, human beings face increasing difficulty in visualizing numerical values. Visualizing 1-10 is no problem for a 5-year-old. Once we get into the hundreds, visualization becomes increasingly difficult. For large numbers, a visual conception is virtually impossible without the aid of technology. To visualize, understand and express the difference between 1 million, 1 billion and 1 trillion is essentially beyond the scope human ability.

In essence, the process of visualizing quantities is a central function of the pilot. During operation, flight crews are constantly required to take tabular, quantitative values such as pounds of fuel, liters of oxygen etc., and then translate these into workable, operationally relevant values such as physical distance or time. The problem is that this process increases in difficulty and decreases in accuracy as the number and complexity of the quantities grow. To count 100 sheep before bed is a function most human beings can perform accurately and

reliably. Inversely, accurately predicting and safely executing an emergency contingency in a depressurized cabin traveling 463kts/hr at FL320 with 16,459lbs of fuel flowing at a rate of 1785 lbs/hr, over a distance of 467 miles, adjusted for a 17 kt crosswind, all while relying on a 1352 PSI oxygen reserve is a different matter entirely.

Today, pilots are still provided measurements on fuel and oxygen assets in quantitative values. ERGO 360 substantially reduces the process of visualization and quickly converts these quantity metrics into visual expressions more coherent to the human experience, and to flight operations in general. The result is an enhanced decision making capability that is far more rapid, accurate and reliable than what has been traditionally available.

To Whom ERGO 360 is Most Useful

Pilots:

The ERGO 360 was specifically designed for use by pilots in the field. Additionally, the interface uses an intermediate level of field specific vernacular and acronyms that may otherwise confuse an untrained individual. As stated previously ERGO 360 is focused on enhancing a pilot's effectiveness during flight by providing them with meaningful information.

Aviation Management:

Applied solutions such as software tools, represent a central part of SMS. In this case, ERGO 360 is an essential part of an oxygen SMS component. For Directors of Aviation, Safety and Standards Officers, or other personnel charged with crafting or strengthening an SMS, ERGO 360 is a must have.

Hypoxia/Altitude Training Professionals

After 60 years, the format of traditional altitude training is being re-examined. One of the major questions being asked is: “What is my solution if descent is not an option?” ERGO 360 is part of that answer. ADS has developed a post-event oxygen management curriculum designed to augment existing hypoxia training programs. ERGO 360 is a great addition to the training curriculum.

The Functions and Features of ERGO 360

Having established why ERGO 360 exists, what it does and who it is most useful to, let’s take a closer look as to the specific functions and features of ERGO 360.

FUNCTIONS

Planning: ERGO 360 is a great planning tool. Utilizing information found on your flight plan, such as diversionary airports and asset quantities such as fuel and oxygen supplies, ERGO allows you to quickly visualize your assets and landing options in radii. Using ERGO 360 as a planning tool is ideal for verifying oxygen reserves or just simply putting a picture to your numbers.

In Plan Mode ERGO 360 triangulates your projected geographic position at the ETP based off of diversionary city pairs. From here you can easily browse potential landing options in anticipation of an emergency. This can prove to be a beneficial planning practice if your aircraft performs operations over large bodies of water, polar regions, mountain chains, uninhabited regions, or hostile or unstable nations.

Actual Mode:

The appropriately named actual mode is made for dynamic use from the cockpit while in the air. Unlike Plan Mode, Actual Mode is all about allowing you to project and act as events unfold. ERGO 360 is capable of syncing with wireless GPS devices, geolocation via the internet, or if internet capability is interrupted/unavailable, manual input of your position. Additionally, Actual Mode provides the ability to adjust projections for wind conditions and unanticipated performance variables.

Actual Mode provides a wide spectrum of utility. By simply inputting numbers found on the flight deck, actual mode will give you distance projections on your asset ranges. By factoring in fuel flow, ERGO will allow for projections adjusted for performance loss or change. Additionally, and most importantly, actual mode unlocks the ability to utilize oxygen as a dynamic asset during a decompression by allowing the aircraft to fly at higher altitudes by utilizing on board oxygen.

Traditionally pilots have been relegated to descent as their only option during a decompression. By having the ability to visualize oxygen and fuel assets concurrently, a flight crew can now balance their oxygen usage against fuel usage and utilize oxygen reserves as a range multiplier. This is of tremendous value in scenarios that involve fuel restrictions, engine failures, or speed to a destination. Actual mode allows flight crews to effectively maintain altitude up to FL250 in a decompressed state should they determine an advantage in doing so.
In Short: Actual mode gives the pilot an unprecedented level of operational flexibility during a smoke/fire or decompression event

100% Mode:
The purpose of 100% Mode is singular: reacting to a smoke/fire event during flight. The name 100% mode is a reference to mask flow rates which are typically built to automatically kick into a pure maximum oxygen flow rate, or 100% oxygen flow. Masks function this way in order to create a positive pressure environment within the mask. This clears smoke from a pilot's face while preventing smoke from entering the mask.
As one might expect, this uptick in oxygen flow will incur a substantial impact on oxygen asset range. 100% mode automatically projects an aircraft's maximum based off of maximum flow rates. This effectively converts many minutes of mathematical calculations in a smoke filled-cockpit into a button press.
100% mode is ideal for reacting to any kind of smoke or fire incident and calculates your range and landing options in a matter of seconds.

Vessel Mode: Vessel Mode was designed for aircraft operators to have view a quick reference of the maritime vessels that will be along their line of travel. There are many vessels in the database, and on any given day the sea can be a busy place. Vessel Mode is ideal for planning or for assessing options under stable conditions.

S.O.S. MODE:
S.O.S. Mode is built specifically to address one of the worst possibilities imaginable: an uncontrolled fire over a large body of water. There are fire events on record in which aircraft have burned up in flight in under 15 minutes. By contrast to controlled smoke/fire events, medical emergencies or decompressions, an uncontrolled fire stands out in that the flight crew may have very little time to react at risk of burning to death. If this occurs over an ocean, the flight crew is faced with a single, equally perilous solution: A mid-oceanic water landing. Understanding intimately the seriousness of such an event, ADS invested heavily in creating a tool to help pilots survive such a catastrophe.

S.O.S. mode will automatically project a 100 NM radius around your last reported location and fills that radius with every landing option in the ADS database. This includes an 8000+ airport database which encompasses short runways and closed landing facilities. Additionally, a 220,000 ship maritime database will be at your fingertips to allow the flight crew to maneuver as close as possible to a rescue craft.
This function is meant specifically for scenarios where the flight crew has determined they cannot contain the fire and prolonged flight has ceased to be a viable option. Over land, this function is crucial. Over water, it is simply indispensable.

FEATURES

Aircraft Specific Customization:
Like the people who fly them, every aircraft is different. Even aircraft of the exact same make and model can possess minor differences that create a big impact on range and performance. As standard practice, ADS conducts a thorough analysis of your aircraft systems during the integration process. This means the outputs generated by ERGO 360 are reflective of the exact performance values of your aircraft based on OEM and equipment specifications found on that specific aircraft.

Universal Standardization:
As we like to say to all of our clients: You may be trained on 20 different airframes in your career, but with ADS you will only need to be trained on one asset management platform. Because of our staunch practice of aircraft customization, ERGO 360 will produce a standardized interface regardless of the aircraft you are flying. From a Cessna 150 to a Boeing 777, ERGO 360 will act and function identically for the user. The idiosyncrasies and parameters found in each aircraft will be automatically handled by the software to produce a seamless user experience.

Metric Conversion
Aviation is awash with multiple metrics, especially when it comes to oxygen. With PSI, Liters, Percentage full, Cubic feet and flow based metering, Oxygen management can get confusing - especially if you are cross trained on aircraft from different OEMs. ERGO 360 includes a metric converter which will allow you to adjust the software for whatever metric is used on the aircraft you are flying.

Real Time Input Variables
ERGO 360 allows you to input tabular metrics from your flight plan or the flight deck in order to make quick assessments. Say goodbye to cumbersome oxygen charts and map plotting! ERGO 360 gives you the ability to assess these variables quickly and decisively in a fast moving environment!

Minimum Navigational Redundancy
ERGO 360 features a manual Lat/Long input field for instances where standard navigational systems are compromised. While this is a far cry from the quality of navigation found on a FMS, it can be a handy backup in the event that the FMS fails. Relying on an iPad battery source will make ERGO 360 an option even in the event of a total electrical failure.

Airport Database
ERGO 360 includes a database of more than 8,000 airports and counting! Color coated by runway length, ERGO 360 is unique in that it includes landing facilities that are not normally

available in a standard FMS. This is because certain aircraft will not be able to take off from runways below a certain length. These short runways were deliberately included to ensure pilots had every option at their disposal in the event of an onboard fire, total propulsion failure or other event in which continued flight ceases to be an option.
Airports are coated Green (6,000ft+) Blue (6,000 - 3,000ft) and Red (-3000ft). Data on each airport can be accessed using a pushpin function to include the facility name, indicator and the longest runway length at that facility.

Maritime Database
The Oceans are a lonely place. With ERGO 360, they will become substantially less lonely. Boasting live streaming data on more than 220,000 vessels worldwide, ERGO 360 brings you a multitude of survival options in the event of a forced water landing. Updated at 15 minute intervals you will see what is happening on the seas below for the entire duration of your flight. Whether you are island hopping in the Aegean, or vaulting the South Pacific ERGO 360 is a must have.
Each ship can be accessed via push-pin to reveal information about that craft including its name, Indicator, speed, and heading.

Maritime Projection/Data Failure
Not everyone can afford data access in the air and, there is no guarantee your internet access will remain after a traumatic event. ERGO 360 possesses a maritime projection option in the event that the data feed is severed. This feature uses data from a vessel's last reported location, speed and direction and automatically projects its position. This gives clients that don't include internet in their budget the ability to still utilize ERGO 360's maritime data.

And of utmost importance is the ability to locate ships in reduced visibility, at night or over a cloud layer where a visual approach becomes unavailable. ADS has developed systems for using on board weather radar to verify ship position plus a comm link where the pilot can speak directly to the ship's Captain during an actual emergency.

ERGO 360 as Part of the ADS Oxygen SMS Component

ERGO 360 plays a crucial role in any Oxygen SMS Component. It is central in giving pilots the ability to continue to operate while relying on oxygen reserves for extended periods of time. Specifically, ERGO 360 is essential for continuing operations in a post event environment if descent is not a safe or a viable option. Click here to learn more about how **ERGO 360 fits into your ADS Oxygen SMS Component.**