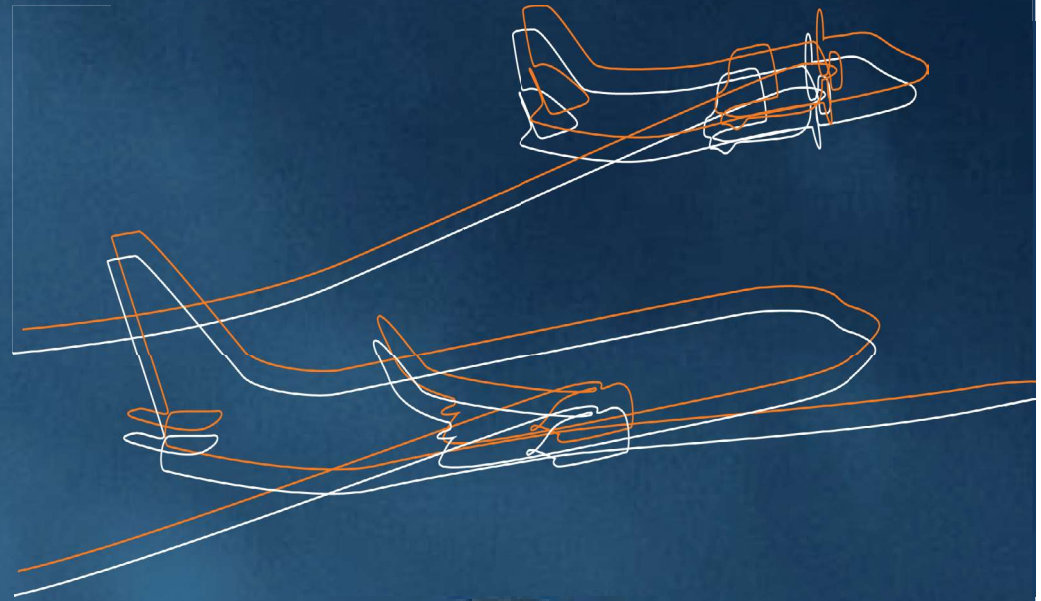


June 2023



rex.

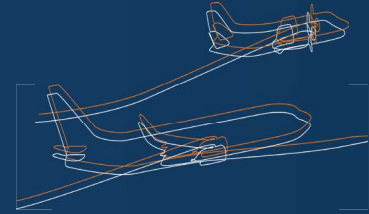


Improving Safety and the Role of SMS in anticipating emerging risks of new Aviation Technology

Professor Ronald Bartsch
Independent Director
Chair of the Board Safety and Risk Committee

Group Safety Management System

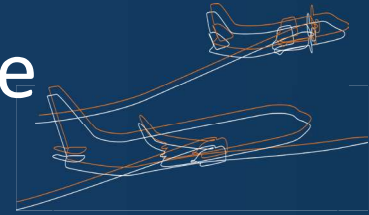
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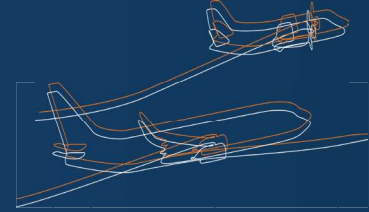
- ✈ Importance of Safety Promotion to drive Safety Culture Post-COVID
- ✈ New Aviation Technology
- ✈ Electrification – Introduction to Dovetail
- ✈ The Rex SMS at Work for data gathering, safety analysis and regulatory compliance
- ✈ The role of SMS in anticipating the emerging risks of new aviation technology



Importance of Safety Promotion to drive Safety Culture Post-COVID

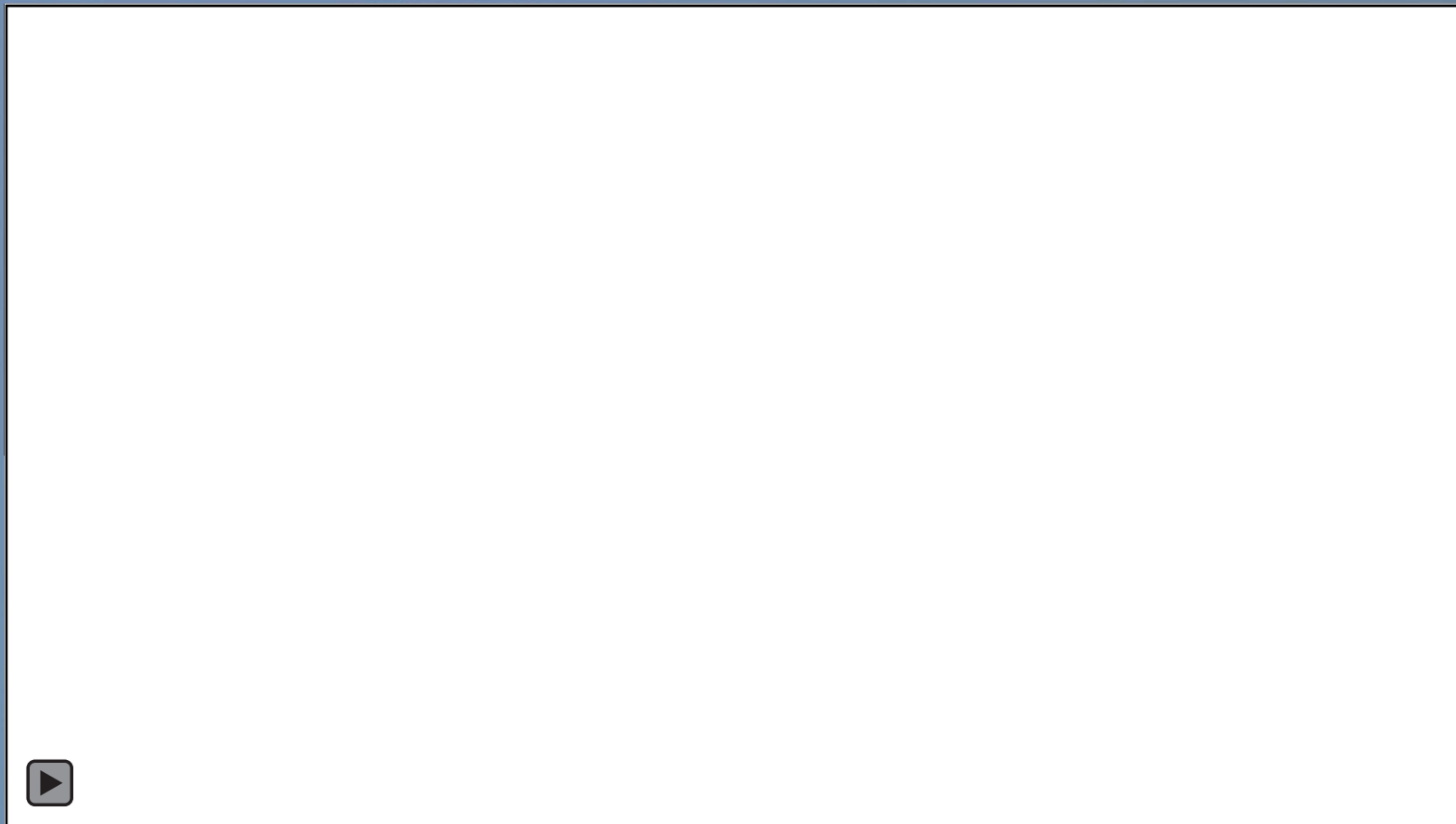
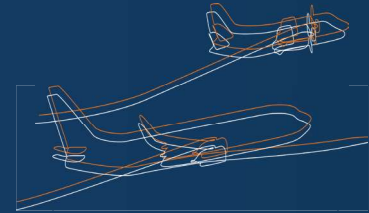


New Aviation Technology

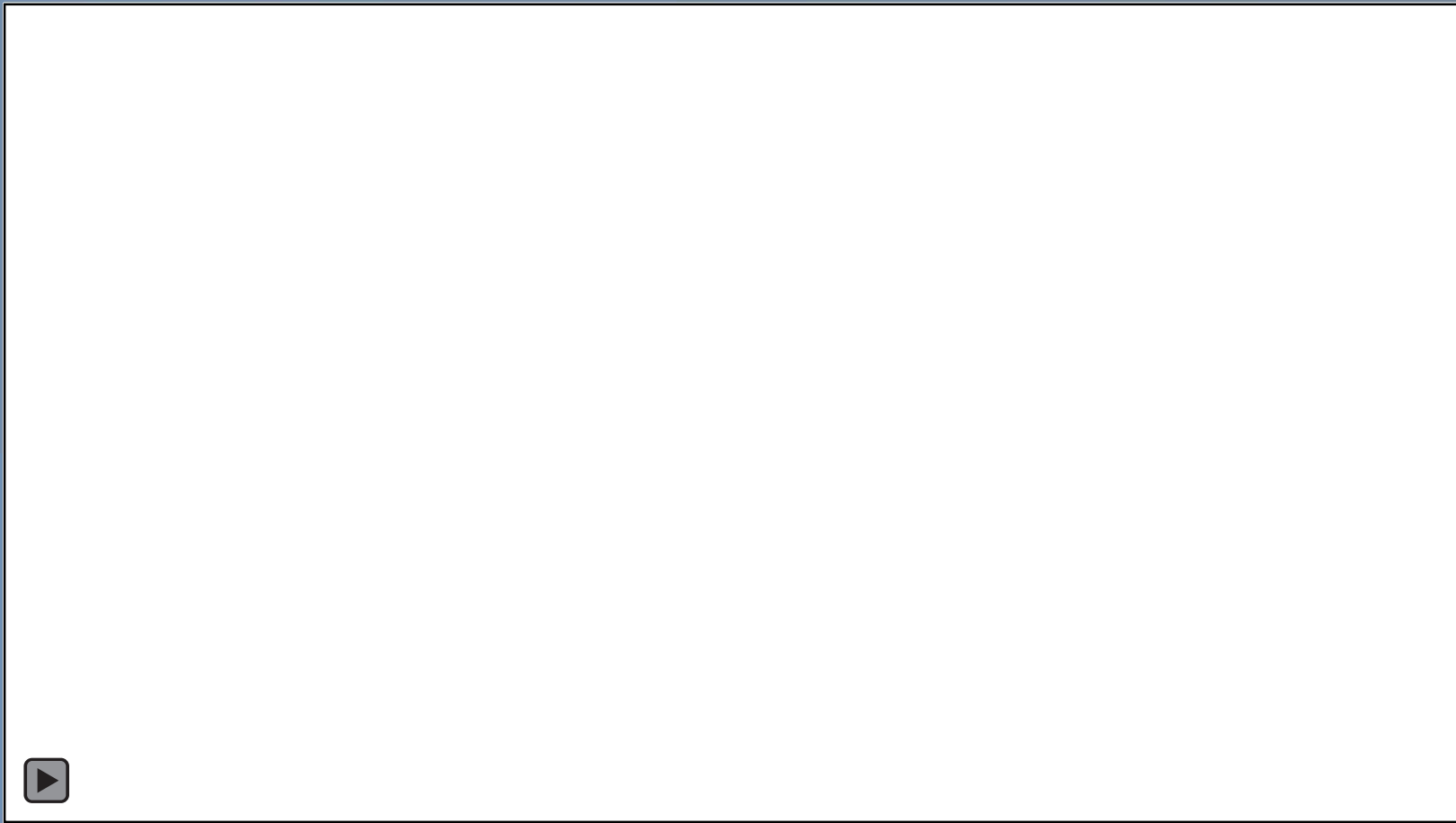
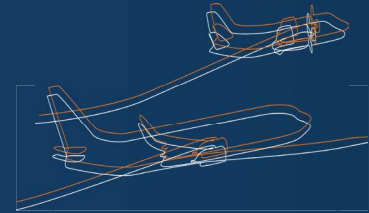


- ✈ RPAS operations
- ✈ e-VTOL aircraft development
- ✈ New airspace technology and the CASA Future Airspace Strategy in supporting the new technology
- ✈ Electrification of aircraft propulsion

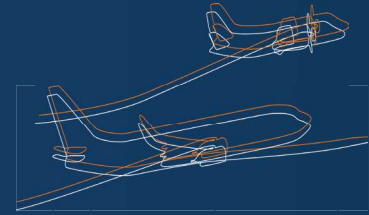
Electrification – Intro to Dovetail



Electrification – Intro to Dovetail

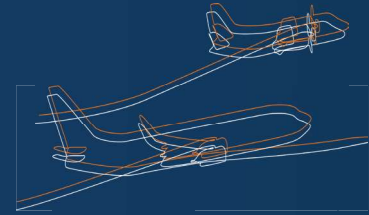


Electrification – Intro to Dovetail



- ✈️ Dovetail are pioneering research and development for the electrification of aircraft propulsion
- ✈️ The electrification of aviation has the potential to abate more than 50 million carbon dioxide tonnes globally, equivalent to the emissions of flights under 500km.
- ✈️ Dovetail's propulsion is 100% electric, there is no need for an aircraft to burn Avgas or Jet A1 fuel.
- ✈️ Dovetail Electric Aviation will abate 1M tonnes of carbon dioxide per year. after 5 years of operation. This is equivalent to 2% of the global regional aviation emissions.
- ✈️ As Chair of the Rex Airlines Group Safety, Environment & Risk Management Committee I am the nominated Director on the Dovetail board.

Electrification – Intro to Dovetail

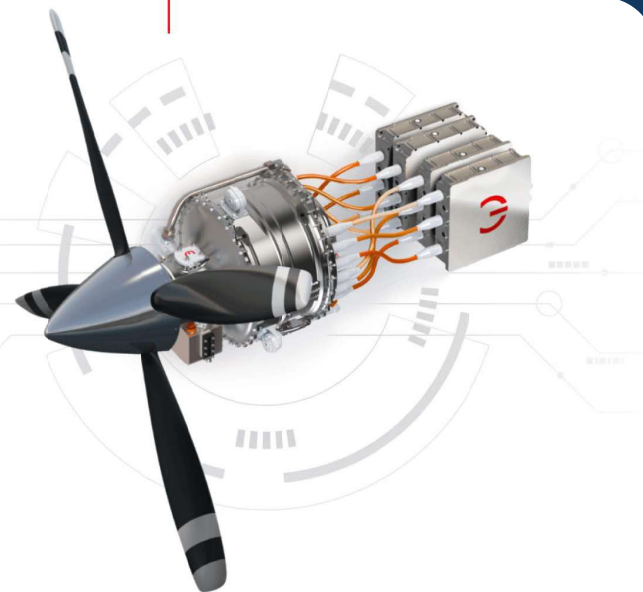


- ✈️ Hydrogen has acquired significant interest due to producing zero carbon emissions and having a high energy density. This density is vital in providing a greater range and weight capacity than other electric options.

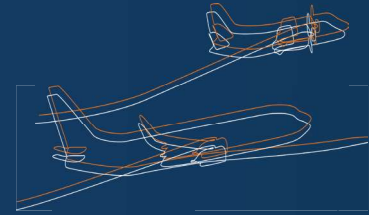
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Battery Electric, Hybrid Electric and Hydrogen Electric Systems

magniX has developed a family of flight proven electric propulsion units (EPUs) and energy storage systems (ESS) for commercial aviation. ESS options include high density batteries and hydrogen fuel cells.



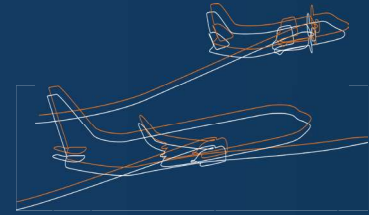
The Rex SMS at Work for data gathering, safety analysis and regulatory compliance



- ✈ The Rex Group SMS is actively involved in considering the current and emerging risks specific to the electrification of aircraft propulsion.
- ✈ The scope for consideration falls broadly in the following areas:
 - ✈ Set-up, equipment, resourcing, training, systems;
 - ✈ Research and development;
 - ✈ Data collection;
 - ✈ Data analysis,
 - ✈ Reliability data;
 - ✈ Risk Assessment;
 - ✈ Policy and Procedures
 - ✈ Operational Safety Cases; and
 - ✈ Regulatory Liaison.

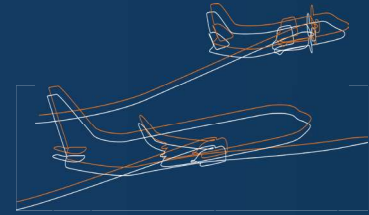


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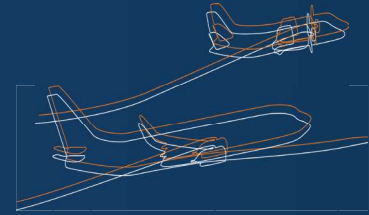
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The Rex SMS at Work for data gathering, safety analysis and regulatory compliance



- ✈️ At a high level, the Rex SMS is assisting with the identification of hazards and the associated risks of the technology in the following areas:
 - ✈️ Power requirements – Electric engines require a significant amount of power to generate sufficient thrust for the operation of an aircraft. Aircraft designers need to carefully consider the power source and storage systems required
 - ✈️ Weight and Size - designers need to carefully evaluate the trade-offs between the weight of the engine and the power it can generate, as well as the impact on the overall weight and balance of the aircraft.
 - ✈️ Battery Technology - One of the key challenges in converting aircraft engines to electric power is the need for high-capacity, lightweight batteries that can store and deliver enough energy to power the engine. Battery technology is rapidly advancing, but are considered a dangerous good and this is a key risk area in terms of battery technology.

The Rex SMS at Work for data gathering, safety analysis and regulatory compliance



- ✈ At a more focused systems level for certification, the Rex SMS is assisting with the identification of hazards and the associated risks of the technology in the following areas:
 - ✈ Engine Failure Modes;
 - ✈ Energy flight planning and energy policies;
 - ✈ System Redundancy;
 - ✈ Emergency Procedures;
 - ✈ Electromagnetic Interference;
 - ✈ Fault Detection;
 - ✈ Fault Isolation and Tolerance;
 - ✈ Maintenance Requirements;
 - ✈ Maintenance Frequency;
 - ✈ Pilot Training and Checking;
 - ✈ Engineering and LAME Training/ Qualifications.



Change is Opportunity

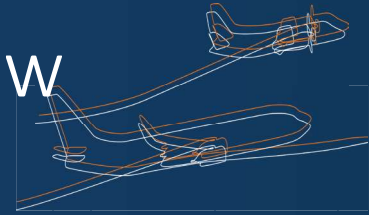
"Intelligence is the measure of our
ability to adapt to change"

Stephen Hawking



Thank you

Seems now that everyone's reading how to become more creative . . .



Thank you . . .

