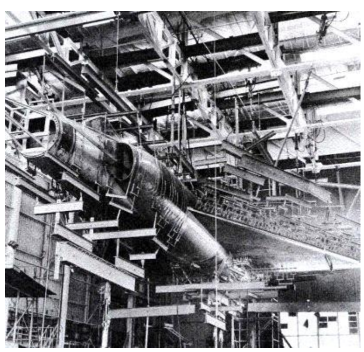
MATERIAL TESTING FOR RELIABILITY AND SAFETY

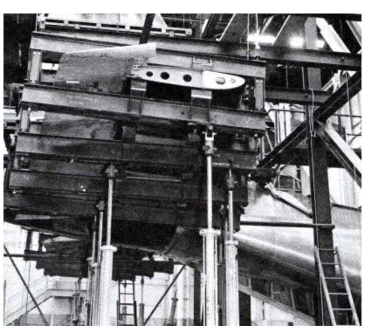
Testing of structures for stability and strength had a very early existence during one of the eras when large scale wood and stone structures were being built. The earliest recorded testing was made on wire by Leonardo Da Vinci in the 1500's and also studied the strength of columns and how width and length influences the strength of a wooden beam.

The expansion of an ever growing variety of industries and the need for knowledge of how material is effected by stress and strain and the environment influenced the development of testing machines especially during the era when stone and iron bridges were being built.

Structural testing can prove the safety and longevity of any large structure or tiny component before it enters large scale production or to test for failure in an existing fully assembled structure.



New engineering guidelines have improved safety and reliability in products and makes possible reduced cost of manufacturing.



Testing and examination is on every line of every preflight checklist. Taking the time to evaluate a scratch or rough edge on a propeller can't be overlooked.

An electrohydraulic system is used in a laboratory and can be used to provide testing of a product using data recorded from actual field studies of product performance.

An electrohydraulic system uses computer technology to control servovalve systems to regulate hydraulic fluid flow to hydraulic cylinders attached to the laboratory test specimen. The cylinders are attached to the specimen being tested at locations were the specimen will receive the same loads and stresses that the specimen would receive during its intended use.

Someone has been looking out for the safety of the general public through regulatory review and testing of products prior and during the products life cycle. The safety story doesn't end there. In the case of a propeller it continues on the ground and I really mean on the ground around the aircraft. The vortex created by a propeller while the aircraft is stationary acts much like a fan and its vacuum effect will pull particles up from the ground that can strike the propeller blade. A small stone striking the propeller blade is all that is needed to start a stress fracture in the blade. Having a clean area for the pre-flight run-up of the engine is important to protect the longevity of the life of the propeller.

A propeller is designed to perform within specific manufacturer's specifications. Within these parameters a propeller blade will act with some elasticity and will remain flexible during various aircraft maneuvers. When these specifications are exceeded the blade material can malfunction either by catastrophic failure or cause vibration when the blade material reaches a point where it will no longer flex or is damaged.

Pre-flight check of the propeller should be a top priority. Some stress fractures are difficult to detect without close examination or even x-ray equipment. Chips and dings on the side panel of a car would most likely be handled by a reliable paint shop. If a propeller has sustained damage it needs to go to a reliable repair shop that specializes in propeller repair. The pre-flight check list is part of every safety story. What is your safety story?

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