existing certified airplane. The new system in the airplane should be certified by customers. In the new project, they should meet all customer's requirements with a large margin of safety relative to the' typical' strength properties of the new process. The following members were involved in the new project: (1) Mike Thompson, Program Manager for the new development project; (2) Howard, Technical Project Manager; (3) Ward Robinson, Director of the Engineering department at a relatively small business unit; (4) Art Blake, Mechanical lead engineer; and (5) Dave Jansen, VP of the business unit. Acme Avionics, Inc. intended to include the new process in developing the structural parts. It should be a high-volume manufacturing process. The project type was a nontraditional project as it was a complex project and includes: (1) Uncertain requirements; (2) Uncertain scope, as the scope is defined by customers; (3) Uncertain deliverables; (4) Complex interactions; (5) Use of large virtual teams. Also, the project assumption was changed during project phases because the technology was changed throughout the project and the statement of work was not well stated and defined.

Key challenges:

- Acme Avionics, Inc. started manufacturing the structural applications for the new project within a new process out of scope relative to the project's baseline and without enough measurements and accepted tests.
- The customers were not comfortable with the mechanical properties of the material produced with the new process.
- The strength of the material was extremely variable, and the material was very brittle since the material's strength is extremely dependent on the part's geometry.
- It was required to conduct some material property testing to prove that the margins of safety arrived at was accurate.
- The first thing that Howard Bono did as the new TPM was to convince the customer's engineering representative and project manager that the process was viable, the margins were high enough, and that the material properties would only get better with time.
- The major discovery of the problem occurred after testing some specimens in the lab. The first round of tensile testing was done, the numbers did not quite reach the typical values were used to determine the stress margins of safety.
- One specimen of the 30 that broke well under the typical value. All we're worried about is the one weak specimen. They stated that the one low specimen showed that the process was not adequately controlled and that they were not sure how they could certify Acme's system on the new airplane.
- After the agreement between the vendor and Acme, it was decided to take parts from the last batch produced and cut them into tensile test specimens. The vendor would then subcontract a local test lab to conduct tensile testing of these parts; five specimens from each of the six structural parts to satisfy the customer's project management requirements.
- The time for the first flight was fast approaching, and if Acme could not come up with a way to meet the certification regulations, the system would have to be added at least a year after the airplane was certified, providing enough time to develop an alternative process which will make a disastrous for the business unit finances and cause delays in starting new projects.
- The problem that come at last happened after the meeting was arranged at the regional Aircraft Certification Office of the Federal Aviation Administration (FAA). Since the customer was responsible for certifying the airplane, they presented the 100 percent test method as a means of complying with the strength regulations.