Accelerating FAA Type Certification with Visual 3D TDPs: BETA Technologies' Journey to Scalable Compliance and Supplier Collaboration

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ANARK®

BETA TECHNOLOGIES

Presenters Bio

- **Patrick Dunfey**
  Anark Corporation, VP of Marketing and Alliances

- **25 years in CAD, MBD, PLM, AR, IoT**
  Mechanical Engineer
  Software Presales
  Product Marketing and Strategy
  Customer-centric programs

- **Lives in Boston, MA: Wife and 2 children**

- **More than just work:**
  Youth soccer and basketball coach, guitar, camping, hiking, swim-bike-run, and a struggling home renovation artist.

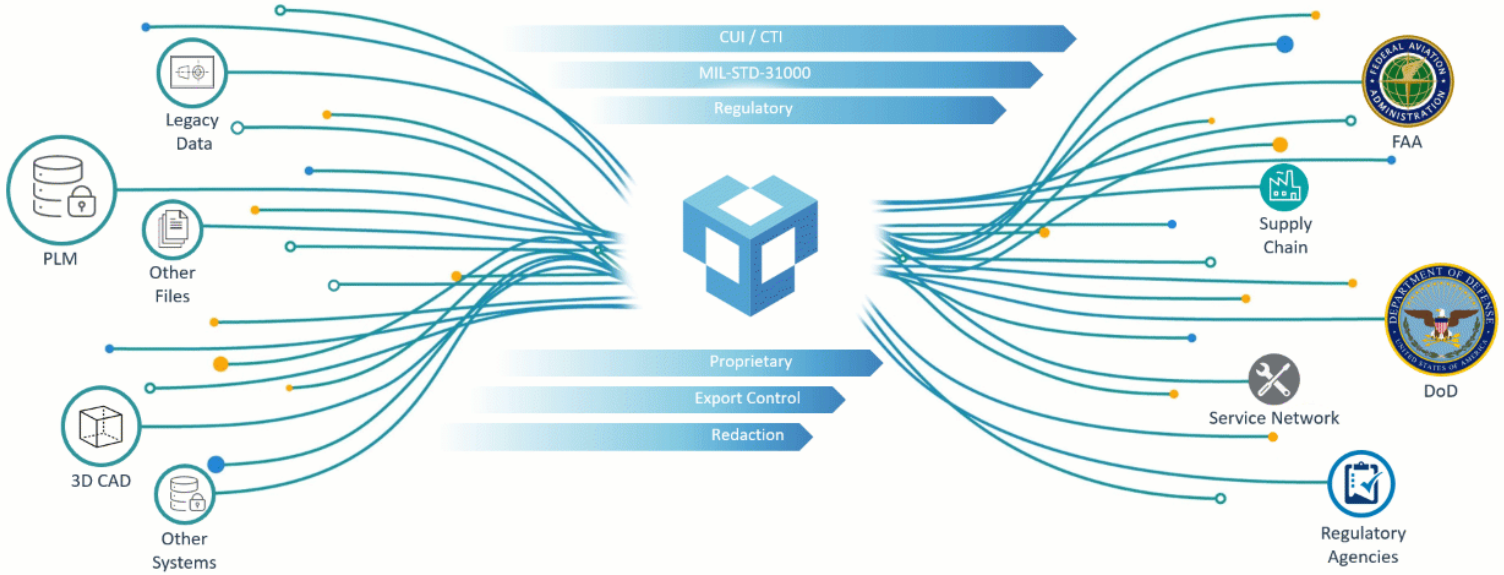
Presenters Bio

- **Stephan de Klein**
  Beta, PLM Team Member and TDP SME

- **Over 30 Years as a Product Development Specialist**
  PLM systems, Model Based Design, Product Development
  Configuration Management Engineer
  Composite Structures SME, Design and Producibility
  Boeing, B/E Aero, Airbus, Bombardier, Fokker and more

- **Lives in Abbotsford, British Columbia, Canada**

Assorted Data Governance and Compliance Challenges



DoD Compliance

Confidently deliver compliant TDPs that meet MIL-STD-31000B, and collaboration spaces that address DoD 5000.97 on Digital Engineering

FAA Type Certification

Deliver secure, FAA-compliant Type Design technical data packages (TDPs) like BETA Technologies

CUI and Proprietary Markings

Automate release controls, CUI markings, and traceable data exchange workflows in the most secure environments

Data Governance and Compliance Challenges

FAA and other commercial flight regulation require **strict data governance & traceability**

Without 3D MBD working practices, compliance process completion is difficult, and go-to-market time can be **significantly delayed**

Compliance can be a significant **catalyst for readiness and speed**, assuming information can be provided using standards that can provide accessibility for decades

BETA Technologies Mission

- BETA Technologies is an innovative aerospace company developing new electric aircraft, motors, batteries, and charge technology from the ground up that will launch electric flight into the mainstream.

- As part of developing a new class of aircraft in the U.S., FAA type certification is a major milestone in the company's path to commercialization, and this challenge was described as an "**existential milestone**" that needed to be addressed.

- "A central part of our R&D team's mission is to deliver a robust design and engineering definition package that meets the FAA type certification aerospace regulatory requirements, and which can be leveraged by our supply chain," **Jesse Cannon, Configuration Management Engineer, BETA**

Deeper into FAA Type Certification

- To succeed in their mission, aircraft manufacturers **can't put an undue burden** on the FAA, **or their supply base**.
- They should avoid requiring third parties to procure certain CAD licenses or deploy specific data management systems to interpret engineering data sets.
- In the case of a catastrophic event which renders the manufacturer unable to support the airworthiness of their deployed aircraft, the FAA owns the type design and has the obligation to monitor and maintain airworthiness in the field.
- It's a critical program requirement to provide detailed engineering data specifications which the FAA can interpret, maintain and use.
- In the case of BETA, it involves the electric aircraft, batteries, charging tech and much more.

Why 3D TDPs Matter for Compliance

- ✅ Build packages to the shop floor
- ✅ Design packages to suppliers
- ✅ Contract deliverables to customers
- ✅ Compliance deliverables to agencies

3D CAD

PLM

Legacy Data

Customer Visibility

Engineering Reviews

Work Instructions

Quality Feedback

Supplier Collaboration

Contract Deliverables

Normalize 3D CAD Models | **Create reusable recipes** | **Drive consistency with templates** | **Automate your processes**

The Real-World Challenge for BETA Technologies

- 3DEXPERIENCE CATIA V6 publishing hurdles
- Preserving PMI/MBD and with highly complex composite modeling

"This became a major stumbling block for us. No one has really figured out how to robustly and easily translate CATIA V6 or 3DEXPERIENCE datasets. CATIA V5 to 3D PDF? No problem. CATIA V6? That's a problem."

Jesse Cannon, BETA Configuration Management Engineering

The Broader Data Governance Lesson

- Locked formats within CAD Systems and some “Interoperability” formats creates compliance risk.
- Governance ensures repeatable, certification-ready data that can be automated in the creation and validation.
- The Digital thread breaks without automation & traceability back to authoritative Engineering IT systems.

How BETA Technologies approached the challenge

- Extensive collaboration with Anark and Dassault was needed to address the technical challenges.
- Determine how to get accurate, repeatable, automated 3D PDF TDP’s that also contained STEP AP242e2 files
- Start with individual TDP’s and ramp up to an automation process

More than a BETA Technologies challenge

- Beta is one example with unique challenges but, the problem is widespread, especially with cloud hosted CAD and PLM systems.
- These challenges span aerospace, defense, industrial, medical devices and any industry where compliance and traceability is key.
- Aligns with MIL-STD-31000C, DoDI 5000.97 Digital Engineering, FAA Type Certification, Medical Device Design 21 CFR 820.30, etc.
- Automated Publishing and Validation provides a compliance & collaboration foundation

Results at BETA Technologies

- Faster FAA certification readiness was achieved.
- Supplier collaboration across hundreds of shops is much more effective, saves their partners money vs. managing more IT systems and allows shops to focus on their specialty capabilities.
- Automation will save BETA between 15 minutes and 5 hours for each TDP that needs to be generated.
- The supply base loved the 3D PDF document; it especially simplified information for non-engineering consumers.

Business Value of Governance & Collaboration

- Compliance accelerates innovation with standardized data creation, packaging and validation.
- Resilient data governance ensures continuity which is a key component of what the FAA and the DOD are looking for.
- This type of activity positions BETA for scalable growth.
- In the composite world, few people are using 3DX. BETA being able to publish composites into the 3D PDFs allow partners to Fabricate and Conform more effectively.

“If we can't produce the TDPs, then we cannot conform those aircraft. It doesn't matter how well the parts are made, or how good the aircraft design is. If we don't have an acceptable TDP for conformity, we're going to be dead in the water.”

Jesse Cannon, BETA Configuration Management Engineering

BETA's Future Perspective

- Hiring a talented younger workforce is easier when you show them modern Model Based Definition designs vs. legacy drawings and documents.
- Knowledge retention going into the future is a serious challenge that BETA can address by modernizing the way they work.

*"**We're setting a higher bar with 3D TDPs from Anark,**" said Rick Florence, Configuration Manager – Aircraft Certification at BETA, **"One that moves us forward with a scalable, future-ready approach, rather than falling back to 2D drawings and later struggling to rebuild momentum around 3D."***

Key Takeaways

- Compliance is a business enabler and while it does take some time and effort to get it right, the payback is significant.
- Visual 3D TDPs bridge definition & readiness
- BETA proves out that a scalable, supplier-inclusive approach can work to create a better product

Rick Florence summarized the impact the company has seen working with Anark, **“We’re super appreciative of the work Anark has done with us, and their engagement with us at every level has been wonderful. The help Anark provided our team allowed us to continue to move at the pace of a startup.”**

Thank you – Q & A

For more information on BETA and other Success Stories

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