

## **Professional Computer Aided Inspection Services For Multi-Billion, Multi-National Companies**



**Bill Greene**  
CEO & VP BD

### **About Level 3 Inspection, LLC**

Level 3 Inspection LLC provides the world's most advanced dimensional quality inspection using 21<sup>st</sup> century Computer Aided Inspection (CAI) from ultra-accurate 3D scanning for precision manufactured parts, products, and tooling. Founded in 2008, the company is now 15 dedicated professionals providing professional services and turnkey automated CAI systems, and the business doubled last year, is doubling this year again.

Our unique Value Promise is to help clients make or buy better precision parts, much faster, at lower cost and with greater confidence. We cut iterations and scrap in manufacturing process optimization, saving months, and often, millions.

Having a diverse background in the aerospace industry gives us an unrivaled understanding of the requirements and challenges of inspecting gas turbine components, as well as other complex precision manufactured products. Our staff is deep with OEM, after-market and supply chain expertise in drafting, product design, all manner of manufacturing processes, advanced full-3D metrology, dimensional quality and metallurgy/materials science as related to turbine engine components, medical devices, and all high precision manufactured products.

We recognize and understand the blueprint requirements and the applicable inspection and reporting specifications. We can interpret the requirements based on our experience and we are well versed on ASME Y14.5-1994M among other standards.

We are registered to the AS9100/ISO9001 International Quality Specification, and accredited to the ISO17025 dimensional inspection lab standard with proficiency test proof that our proprietary CAI process is accurate to +/- 2 microns (0.00078 millionths of an inch), for when high accuracy is needed. We comprehend all aspects of first article inspection requirements including the jet engine Original Equipment Manufacturers specifications better than most anybody in the industry.

We understand the need to have quality inspection done in a timely manner, and recognize that time is money, therefore our rapid inspection project turn times are the best anywhere, to support this client need.

We understand product lifecycle management and our tooling inspection can trend die wear, which allows our customers predict usable life of tooling with much more accuracy, leading to shorter production line downtimes through better planning and more focused rework plans.

Our proprietary CAI process yields a unique visual representation of the actual manufactured product as compare to the nominal design file (or other products) and therefore can shorten the problem solving cycle significantly (30%-50%) as well as provide visual records of the problem, and the clear solution to the root cause.

**Interview conducted by: Lynn Fosse, Senior Editor, CEOCFO Magazine**

**CEOCFO: Mr. Greene, what was the concept when Level 3 Inspection was founded, and where are you today?**

**Mr. Greene:** My business partner, Scott McAfee and I realized that there was an opportunity to dramatically advance the state of the art for high technology computer-aided inspection from very high accuracy 3D scanning. We had been in that field working at another company where CAI was a sideline, and we realized there was an opportunity to make this far

better, serve more clients, bring greater value and help American manufacturing rebound much better than it could without this capability. Today, we have developed into the world's most advanced dimensional quality inspection company. We are delivering on our value promise of helping our clients make or buy better precision parts much faster at lower cost and with greater confidence. We are now 15 dedicated professionals who do this all day, every day, and we have four advanced 3D scanners that are highly utilized, including one that travels on the road to client sites. We perform Computer Aided Inspection professional services projects to help multi-billion dollar, multi-national companies optimize their manufacturing processes to produce conforming parts much faster and prove it much better, so they can more readily sell them to their customers.

**CEOCFO: *Would you explain what a typical engagement would be?***

**Mr. Greene:** Usually, we get started with a company to perform first article inspections (FAI), which are the quality conformance inspections that allow them to go into production to make and ship hundreds or thousands of parts to their customer. Usually, the reason that they get started with us is because they have a backlog in their internal inspection department. We have likely been talking to them for months or years, and they finally decide they will give us a shot because they are backed up, slipping their delivery dates, and it is starting to negatively impact their business. They let us have a shot because we have been professional and persistent, and then they send us the digital product definition, CAD models, the blueprints and a sample set of parts. We perform the 3D scanning and complete analysis, issue comprehensive customer-ready reports over the Internet, per our typical services projects delivery process. Every time, this new clients tell us our results are better than we said it would be and their customers love it. That is how we start our relationships, and that is why we have such regular repeat customers.

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**CEOCFO: *What are the standard methods of inspection and how do they compare with Computer Aided Inspection? What are some examples that you are able to pick up that other means of review would not?***

**Mr. Greene:** I have a number of great examples of that. 3D scanning is extremely high accuracy digitization of any 3D object. It makes a 3D digital surface of the actual part complete geometry and allows all kinds of engineering and analysis tools to address this 3D scan file for inspection, reverse engineering, or other types of trending. It is 10,000 times more dimensional information than is provided by traditional measurement systems. The 60-year-old traditional measurement technology called coordinate measurement machine (CMM) is essentially a granite slab, overhead gantry with a hanging arm and a micro switch on a probe that touches the part in a few hundred places and issues a table of numbers with XYZ coordinates. Somebody has to wade through these tables of numbers and try to determine if the surface of the part is conforming to the design requirements. It takes a tremendous amount of painstaking investigation and time, and studies have shown that it is misinterpreted as much as 20 percent of the time.

We are able to provide full part 3D scanning and 3D visualization of part conformance to design requirements because we have so much more information on the entire part geometry. We provide our SmartCompare™ color-plot of the geometric conformance and deviation of the manufactured part to the design documents, for fast understanding and collaboration, then we extract all the dimensions called out in the blueprint, populate a spreadsheet with all of those measured results, including pass/fail, and issue amazingly comprehensive dimensional quality inspection reports securely over the Internet. Our customers have told us that these inspections have reduced their dimensional inspection report review time by 90 percent, because it is so easy to understand, it is so intuitive, and it is so readily supports their decisions on what to do with the manufacturing process, leading to faster delivery of conforming parts.

**CEOCFO: *Why would a manufacturer not want what seems so much better?***

**Mr. Greene:** I have spent my whole career wrestling with this, and the answer to your question is fear of change. They used to say, “Nobody ever got fired for buying IBM.” Well, IBM does not even sell computers anymore, so the world continues to change, and smart companies adapt with the change. With the traditional measurement technologies, grandpa put them in (literally), dad used them too, so now the son uses them because it is what they have and what they know, not because it is the best and certainly not because it helps their business be better. If a parts producer is really looking for tight tolerances and they really want to know what the manufacturing process is producing, more data is always better. Every engineer in the world would rather have more information to solve a problem with than less information. Once they see these results, many clients make more and more use of our professional CAI services, and

then acquire our CAI automated systems, simply because the value proposition is clear and delivered. They make and save a lot of money by working with us.

**CEOCFO: Do you find that the more successful manufacturers or the ones who are buying new equipment and keeping up that tend to use your service more?**

**Mr. Greene:** Yes, absolutely, we are working with the best precision manufacturers in the field. This advanced method is for the people who are serious about being the best. In the worlds that we work, precision manufacturing, primarily jet engine parts, orthopedic implants, and other precision manufactured tight tolerance products, the people who are interested in accelerating their lead in the marketplace by making conforming parts faster to serve their customers and their stockholders are using our technology more and more. This is working well for them; we are literally saving programs and schedules and enhancing careers among our clientele. These clients tell us that their customers, the leading jet engine manufacturers of the world, like our results so much that they are now recommending us more and more.

**CEOCFO: Are there any regulatory agencies that, at some point, could insist on this technology?**

**Mr. Greene:** We have certainly worked with some clients to support applications to the Federal Aviation Agency, the FAA, and that agency knows who we are and what we have done to help producers to make parts better for the commercial aviation industry. We have tried to educate the FDA, the Federal Drug Administration, with much less success, and they have a much different relationship with their industry companies than the FAA does with the aerospace industry. This medical device industry with FDA agency relationship is somewhat adversarial, even antagonistic to a degree, which is unfortunate. I would like the opportunity to educate the FDA about how these technologies and capabilities can help their mission of making sure the companies are making better orthopedic implants to better serve the health care needs of the population of the United States of America. The FDA should definitely learn more about CAI and should recommend it to whatever degree they can because it will help this medical device industry do a better job of reaching their mission serving the American public with better products. It works, and it's overdue, based on the recalls and lawsuits everyone sees so much these days.

**CEOCFO: You are the world leaders in computer-aided inspection (CAI) from high-accuracy 3D scanning. What is the competitive landscape? Are there many companies that are doing this at all?**

**Mr. Greene:** There are not very many, and we know them all. We are the master practitioners in this field because we have more experience applying the tools. The rest of the market is primarily the equipment vendors and equipment brokers, and we distinguish ourselves from that in that we are master practitioners first. We provide more professional services than anybody in the country does, and we are 10 times bigger than our nearest service providing perceived competitor is. Anybody can buy a scanner, but knowing what to do with it and how to solve a problem with it takes considerable experience. I ask people all the time, "How long will it take you to get 14 years of experience?" In addition to professional services, we also provide patent pending, automated systems to perform this CAI process for our customers that want to bring it in house. We do not just broker scanner equipment; we provide turnkey dimensional inspection "answer machines". These systems are highly integrated and fully automated to deliver the geometric conformance and dimensional inspection results on the shop floor, with a non-technical operator, in about 10 minutes.

**CEOCFO: When does the experience at Level3 come into play?**

**Mr. Greene:** Domain expertise is our primary distinction in multiple domains. One is precision manufacturing. I am a metallurgical engineer, and I have seen and automated almost every manufacturing process that exists. I sold robots to the aerospace industry in the early 1980s, so I have been involved with this for a long time. My business partner is a mechanical engineer who designed jet engines for Pratt & Whitney for nine years before reverse engineering industrial gas urban engines for another nine years before we got together and started offering computer-aided inspection from 3D scanning. Domain expertise is important and we have nearly 14 years of hands on experience using these tools on the most demanded precision manufactured parts in the world. We have performed nearly 4,000 inspection projects and delivered results, advice, and systems for our customers based on this experience on how to use these tools to improve business. Knowing how to get these technologies to work, knowing the tools and objectives as well as the inspection requirements from the manufacturing process, is what makes us different and is why we have been so successful. As an example, last year we performed the world's most comprehensive, complicated, challenging and expensive dimensional inspection project in the history of the world. It was a high-five-figures service project, and our client, the aerospace foundry, turned it over to us because we knew more about the specifications and requirements than they did. They just wanted us to do it for them and give them a fair price, which is exactly what we did. It sailed right through to their customer, who loved the results, and everybody was very happy with the outcome. Because of that domain expertise and knowing what the requirements are, plus how to deliver the results that are needed, they just let us do these projects without many challenges. These are becoming sound technology business partnerships.

**CEOCFO: *What is ahead for Level 3 Inspection?***

**Mr. Greene:** We are leveraging this experience and the proprietary processes that we have developed from performing so many inspection service projects and accelerating the state of the art by advancing the application of these tools through our expertise and a high degree of automation. What we are doing next is taking that process and putting it into a patent pending system that can roll onto the shop floor, plug into 110 volts, and any non-technical operator can place a part in a gripper, barcode scan the router that came with it, and walk away. In about 10-12 minutes, the entire process of scanning, aligning the parts scan to the CAD model, generating the color plot of geometric conformance and deviation, extracting all the dimensions called out on the blueprint and populating a spreadsheet and PDF report, plus porting that inspection results into statistical process control databases, is completed, all completely without human intervention. That is where we are going, and it is because of the expertise, experience and accomplishment of having done so many of these inspections, but even more because we have found that our customers want to receive a dimensional conformance answer. We deliver that dimensional inspection answer, *fast*.

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ALL SYSTEMS GO.

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