SYLLABUS

Fundamentals of Gun Design

COURSE NUMBER: GIQI-005

Overview: This course is for engineers and technicians who have an established background in basic firearm design fundamentals from small arms to medium caliber cannons. It is designed to advance their knowledge through presentation of the latest technologies, performance measurement techniques, and advanced materials. A major focus will be on lessons learned through years of firearm design and recommendations passed on from well-recognized leaders in the firearms industry. This course is taught by Mr. George E. Kontis who brings the knowledge gained in more than 50 years in firearm design, analysis, testing, and sales.

Goals: To present the relevant technologies and the mechanics of the most important functions of firearms, ammunition, and the interaction between them. A major focus will be on increasing reliability. At course completion, the student will have gained an advanced technical knowledge of firearm design, testing, ammunition, performance evaluation, and materials.

At course completion students will:

- Understand the importance of design reviews & intellectual property protection
- Have a better understanding of what should be included in the Technical Data Package
- Understand gun barrel design and be able to meet performance criteria
- Appreciate the advantages in using the latest barrel materials
- Understand the mechanism of bore wear and barrel failure
- Recognize the importance of headspace with an understanding of how it is measured and functioning problems which arise when limits are exceeded
- Realize the importance of round control and the control of expended cases through the complete gun cycle
- Recognize the importance of primary extraction as it relates to reliability
- Understand the effects of barrel stiffness, vibration and barrel mounting
- Recognize the types and orientation of springs used in firearms
- Determine the suitability of threaded fasteners in the firearm application
- Better appreciate the cost of tight tolerances and surface finish

- Appreciate the importance of developing products which are easy to maintain and understand when components have reached the end of their useful life
- Be able to explain recoil, free recoil energy, impulse, and firearm controllability
- Know best practice for firing range testing

Lectures: This is an in-person course taught at an informal level with interaction between students and lecturer encouraged. Course duration is 8-hours which can be presented in a single day or over two successive days.

Texts and Related Course Material

Each student will receive course study guide and an electronic copy of the course bibliography.

Course Topics

- Tailoring Gun Design to the Enduser
- Design Reviews
- Chamber interactions at time of projectile launch
- System Accuracy Life
- Achievement of Maximum Reliability
- Barrel Tube Structure & Design
- Mechanical & Heat Effects Elements of Bore Wear
- Barrel Materials and Specification
- Importance of Proof Firing
- Barrel Vibration
- Barrel Mounting
- Technical Data Package
- Range Testing

About Mr. Kontis:

George Kontis has worked as an engineer at the General Electric Armament systems division designing and testing aircraft cannons and small arms. He developed new firearm testing methodology and was co-designer of the GPU-5A 30mm gun pod. He has held engineering and senior management positions at: GE, FN, Barrett Firearms, Heckler & Kochand Knight's Armament Co. Kontis is listed as a subject-matter expert in firearms by the U.S. Defense Systems Information Analysis Center. In 1998, he was awarded the Col. George M.Chinn award for his contributions to the field of small arms, and he holds numerous firearm-related patents. In 2015, he founded Gun IQ International LLC, a consultancy firm focusing on advancing firearm technology, failure analysis, patent issues and the use of advanced materials and processes. He has authored more than 50 articles with a primary focus on the technical aspects of firearms.

Course Pricing: Upon request.

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