

Tutorial Title: Side Scan Sonar ~ History to Application

Continuing Education Units and Professional Development Hours

Instructor(s): Garry Kozak

Overview:

A basic introduction to the basics of Side Scan sonar. It will lead you through the historical developments and basic principles and applications of the systems.

A thorough discussion of acoustics as they relate to sonar design will follow, with emphasis on the physics of sounds in water and how they enable the technology to form an image record for further interpretation. Details of pulse length, beam width, frequency and resolution will be discussed.

With an understanding of the aforementioned principles the tutorial will focus on data interpretation. It will introduce the participant to surface effects, targets and shadows, as well as other sources of noise in the sonar record.\

Finally field operations and system architecture will be discussed to bring the theoretical to real world.

The course will include:

INTRODUCTION

- Historical Development
- Basic Sonar Principles
- Applications of Side Scan Sonar

SONAR DESIGN DETAILS

- Introduction
- Source Level
- Pulse Length
- Beamwidth
- Frequency
- Resolution

UNDERWATER ACOUSTICS

- Introduction
- Sound Velocity
- Spreading
- Absorption

- Refraction
- Mechanisms for Sound to Return to the Sonar: Reflection
- Backscatter (Reverberation)
- Time-Varied Gain
- Noise

DATA INTERPRETATION

- Surface Effects
- Targets and Shadows
- Sonar Design or Function
- Refraction
- Electrical Noise
- Distortions
- Quantitative Treatment
- Data Processing

SIDE SCAN SONAR SYSTEMS

- System Architecture
- Transceiver
- Towfish
- Towing Accessories

FIELD OPERATIONS

- System Installation
- Towfish Rigging
- Operational Variables
- Towfish Positioning
- AUV's
- Targets

Biography:

Garry Kozak has been serving the undersea industry since 1970. His early career as a commercial diver, supported oil drilling rigs off the coast of Newfoundland, pipe laying in the Gulf of Mexico and salvage operations in the Great Lakes. Garry's career in undersea search and survey began in 1972 off the coast of Labrador using an EG&G sidescan sonar. Garry has more than 40 years of field experience managing search operations from the Arctic to the Tropics. Garry created the very first formal training course on side scan sonar and has trained more people, Navies, and commercial organizations on the use of this technology than any other person in the world. Today Garry travels the world providing consulting and training expertise to Navies and companies who have a critical underwater search need.