

The Logistics of 2D Seismic Acquisition in the Amazon Basin

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Introduction

In the later half of 2003 and the first part of 2004 Petrobras, the national oil company of Brazil, commissioned a 2D seismic program in the Amazon Basin of Brazil. This paper presents, with vivid photography, the logistics of completing such a survey.

General

Everything about seismic acquisition in the Amazon basin of Brazil can be difficult. Airplanes, helicopters, boats, and walking are required to move both man and materials. The 50 meter tree canopy and dense growth make conventional radio communication impractical. Satellite connection must be used for communication to the outside world. Single side band radios with long antennas can provide site to site communications within the jungle. Wire-line communication via the seismic line cable is essential for voice communication with the crew on the ground.

The dense canopy also makes non-intrusive helicopter deployment impractical. Landing pads need to be created in the rain forest. Central recording electronics, line equipment, shooting interfaces, SSB radios, line crew, medics, observer's, surveyors, radio operators, and supervisory staff all need to be moved into the jungle and out onto the line. Special attention needs to be paid to providing safe working conditions within a rugged though exotic environment.

People

A large number of people are required to safely acquire a seismic program under the canopy of the Amazon Rain Forest. For this program the human logistics looked like this:

35 Petrobras Employees, including: Managers, Engineers, Geophysicists, and Seismic Instrument Observers

400 Support Crew, including: Pilots, Survey crews, Cutting crews, Line deployment crews, Medical staff, etc.

Equipment

The equipment required on this program included:

2000 Channel "fire-by-wire" 24-bit seismic recording system , 3 Helicopters, 20 Barges for transportation, housing and offices, 20 Single Side Band Radios, 1 Satellite system for data and voice communication, and 10 portable camps including Kitchens.

Deployment

People and equipment were moved to remote camp areas spaced 7 km apart. Line deployment crews would layout the 280 channels of receiver line equipment over the 7 Km. ending up at the next camp. This must all be done on foot. The Central Recording Unit, Single Side Band Radio, Medical Station, Kitchen and crew camp was set up at the helicopter landing pad areas.

Daily Activity

A typical day on the crew would begin with a 6:00 am safety meeting. The layout crew would then begin the task of deploying 280 channels of equipment at 25 meter intervals. 200 5-second records would be recorded, and the next day everything would be repeated. Every second day the central recording system would be lifted by helicopter to a new camp area.

Accomplishments

Petrobras / SAG crew ES-26 acquired 600 km of new seismic data over a 5 month period. As all instruments had to be repaired on site in the rain forest, and QC processing of the seismic data was performed in the field, Petrobras was also able to provide jungle operations training and experience to a new generation of seismic workers.



Confluence of Negro and Amazon Rivers at Manaus, Brazil



Project location relative to Manaus



Crew and equipment arrive by boat



Central Recording Unit moved by helicopter



Single Sideband Radio – a jungle telephone



Central Recording Unit House (Casa Blanca)

Reference:

Photography supplied by:

Mario Sergio Costa – Petrobras /SAG ES-26, 2003 - 2004

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