

Cadastral Training Plan 2001

Purpose

Training is one of the many functions performed by Cadastral Survey for the Bureau of Land Management (BLM). Properly trained employees enable the delivery of timely, efficient, and defensible products to customers of the BLM. As the recognized experts in the Public Land Survey System (PLSS), the BLM is called upon to train land surveyors in other federal agencies, and the private sector, in addition to BLM personnel. Providing training to these partners serves the BLM by assuring quality survey products are being accomplished throughout the surveying community. This plan addresses the demonstrated training need and offers a structured, systematic approach to provide training through the next ten years.

Historical Background (1969 – 1992)

In the late 1960's, BLM Cadastral Survey identified that their professional surveying corps had a wide variation of educational training. Most of this training was non-technical in nature. A training plan was developed and approved whereby all employees were sent through intensive, month-long courses. These courses were originally named P1, P2, P3 (Professional) which later evolved into a single, shortened course named Advanced Cadastral Survey (ACS). After all employees had completed these three, month-long courses, some of the individual courses were converted into slide-tape learning courses (Distance Learning). Some of these are:

9600-ST 11 Astronomical Observations and Computations

9600-ST-17 Cadastral Plat Preparation

9600-ST-22 Restoration of Lost Corners by Proportionate Measurement

9600-ST-23 Introduction to Water Boundary Surveys

9600-ST-25 Subdivision of Sections

In 1979, the Forest Service (FS) requested to be included in BLM's cadastral training. This was accepted and most of the FS land surveyors have completed the ACS or a later course named Advanced Rectangular Cadastral Survey (ARCS). The FS has been an integral partner in the planning, organizing and implementation of cadastral training. Other federal agencies, along with private land surveyors, have also attended this training.

By the late 1980's, most land surveyors from the BLM and FS had attended the month-long ACS course and the slide-tape learning courses were becoming obsolete in their delivery method but the course content remains valid even today..

Modern Background (1992 to present)

In early 1992, the month-long ACS course was shortened to two weeks, eliminating the water boundary, mineral surveys and legal aspects topics. The course name was modified to ARCS to reflect the reduced content. This course was offered in 1993, 1994 and 2001. In the early 1990's several offerings of a modified ARCS course were presented to the private sector surveyors in several states (OR, WA, CO, and AK). This "mini-ARCS" course was well attended and provided the students with training which is not available from any other source.

Other Training Opportunities

In 1997, land surveyors from the BLM and FS identified a need to have Realty Specialists and land surveyors from both agencies attend a common course. Foundations of Land Tenure, a course based upon communications between these professions, was developed and has been successfully offered numerous times in the western states. The instructors are subject matter experts from both agencies and disciplines.

Needs Analysis

A Cadastral Training Needs Assessment (CTNA) was conducted by the BLM National Training Center and administered in FY-01. The purpose of the analysis is to determine the perceived needs of the cadastral community. The survey included over 200 responses from federal land surveyors from the BLM, FS, BOR, and USFWS. Some results of interest are:

- 1) 94 respondents said they needed training in least squares adjustments.
- 2) 101 said they needed training in water boundaries.
- 3) 58 said they needed training in mineral surveys.
- 4) 41 indicated they needed training in legal research.

The demographics of those federal land surveyors responding indicates the following:

Cadastral Experience:

Less than 2 years (1)

2-5 years(6)

6-10 years (10)

More than 10 years (179)

The average years until retirement eligibility is approximately 6. Recruitment to replace this large number of employees is ongoing. These newly hired land surveyors will need training in the specifics of surveying in the rectangular surveying system which is not covered in the depth necessary in college.

The cadastral demographics indicate a significant gap between the knowledge and experience of the senior surveyors and those recently hired. This wide variance was demonstrated during the 2001 ARCS course where there were 25 students each from the BLM and FS in attendance. Student interaction during classes, pre and post test scores, and student evaluations revealed that different levels, or stages, of technical training needed to be developed.

Cadastral Training Plan

This Cadastral Training Plan provides a structured, systematic approach to training that will accommodate the training needs of Land Surveyor employees as their careers develop. The plan

will provide means for the transfer of knowledge from senior surveyors, whom are rapidly advancing towards retirement, to newly hired surveyors. The plan is structured so BLM can fulfill its role to training the entire surveying community on the rules for surveys on the PLSS. The plan adopts a staged approach to incrementally advance training to meet the needs of new employees, Surveying Technicians and senior surveyors. It utilizes distance learning technology, when appropriate, and traditional classroom instruction for subject matter not suited for distance learning.

There are four components to this training plan, consisting of distance learning courses and traditional classroom courses. They are:

Advanced Cadastral Survey-Distance Learning Courses (ACS-DLC)
Advanced Cadastral Survey I (ACS-I)
Advanced Cadastral Survey II (ACS-II)
Advanced Cadastral Survey III (ACS-III)

ACS-DLC

Develop state of the art distance learning courses (DLC) that cover the techniques of surveying in the PLSS. These courses will make use of the content from the Self Study Training courses developed by the Cadastral Training Staff in the late 1970's and early 1980's. The content in these old courses is valid today but the delivery method is outdated. Listed below, in order of development, are fourteen courses that should be developed for delivery using modern distance learning technology:

- 1) Restoration of Lost Corners
- 2) Section Subdivision
- 3) Original Surveys
- 4) Celestial Observations
- 5) Records Investigations
- 6) Plat Preparation
- 7) Legal Land Descriptions
- 8) Corner Point Identification
- 9) Monumentation
- 10) Analysis and Adjustment of Survey Measurements
- 11) Special Instructions
- 12) Introduction to Water Boundaries
- 13) Junior/Senior Surveys
- 14) Durability of Bearing Trees

The training plan requires the mastery of the first seven courses as prerequisites to attending ACS-I. The pre-requisite DLC 's need to be developed first. The next seven courses will be developed as time and budget allows.

The DLC courses are intended to bring all entry level and newly hired surveyors to the same minimum skill level in the most cost effective manner. These courses will thoroughly cover the basic fundamentals (what and how) of their application. The advanced aspects of these topics (when and why) are more thoroughly addressed in the next level of training, ACS-I.

ACS-I

This is a classroom course designed to assure students mastered the ACS-DLC material and to expound on aspects not well suited for distance learning. In ACS-DLC the student learned how to properly apply the various techniques, in a general sense. This course will cover in-depth the many exceptions to the general rules and explain how these methods could be used given a specific set of facts. For instance, in ACS-DLC a student will learn to use the method of single proportion to restore a lost section corner on a range line. In this course we would discuss when it may be appropriate to use a different method and the reasoning behind it. This type of learning is better suited for classroom instruction as it often leads to much discussion and exploring the “what if” scenario. This course will also prepare the student for taking ACS-II. It is envisioned that this course will be one week in duration.

ACS-II

This will be a higher-level course similar to the current Advanced Rectangular Cadastral Survey course (ARCS-9600-08). Some subjects in the current ARCS course will be eliminated and all topics will be elevated to a purely professional or senior level discussion. This course will build upon ACS-I by exploring the many gray areas surrounding the law as it applies to cadastral surveying . This course will be two weeks in duration and students must have successfully completed ACS-DLC and ACS-I before attending. It is intended that all cadastral surveyors who have satisfactorily completed the prerequisites would be eligible to take this course.

ACS-III

These will be classroom courses covering the following topics:

- Water Boundaries
- Mineral Surveys
- Legal Aspects of Cadastral Survey
- Others TBD

Each topic will be developed as an independent course anticipated to be one week in duration. These courses are not intended for the entire cadastral community but rather those specific employees in a State Office organization who will act as specialists for that organization.

Time Frames**ACS-DCL**

The first 7 courses need to be completed before ACS-I is offered. The plan is to have these courses delivered as they are developed so students can progress into ACS-I when it is offered. Ideally they would all be delivered by March, 2003, with the remaining courses coming on line by March, 2005.

ACS-I

Will be offered March, 2003.

Will be offered March, 2004

ACS-III

The first course will be offered March 2005 with the remaining courses to be offered in the out years.

This plan was developed with input from the U.S. Forest Service who has been a primary cadastral survey training partner with BLM since the late 1970s.