

MINING TECHNOLOGY

TRAINING COURSE CATALOG



CAT® MINESTAR™



FLEET



TERRAIN



DETECT



HEALTH



COMMAND

CATERPILLAR®

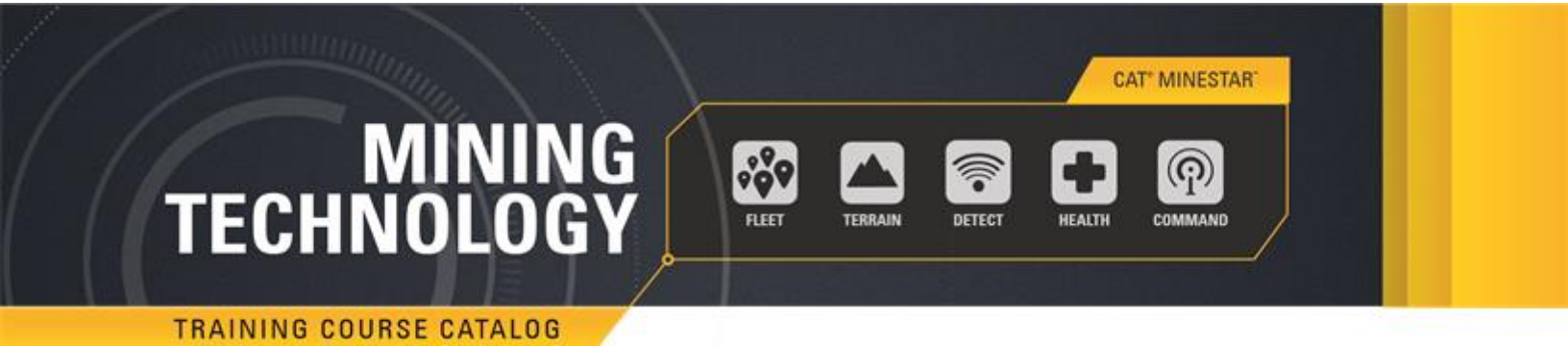


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Mining Technology Course Descriptions 2

How to Use This Course Catalog

This Training Course Catalog can be used to review the MineStar Training Offerings that are available that can be found on page 7. Course descriptions can be found towards the end of this catalog that make up each of these programs. Once you decide on which program you'd like to take you can go to page 21 to learn how to sign up for the program.

20+ MineStar Training Offerings

The Training Course Catalog allows you to search in several ways, and one of the most important is by MineStar Training Offerings. There are over twenty of these, so it's worth taking the time to look over the major headings before dipping into the details of specific courses. The programs are organized by Product.

Spend some time familiarizing yourself with what these MineStar Training Offerings say about themselves. As you read through the Training Offerings, you will see general information on what the program is about, what the goals of the program are, and what the course of study in that program include.

How to Request Information for Training Offerings

There are several ways to request information for training offerings. You can email MineStar_Training@cat.com and request information. You can also go to <https://www.cat.com/minestartraining> and scroll down to the link to the form.

MINING

MINING TECHNOLOGY TRAINING

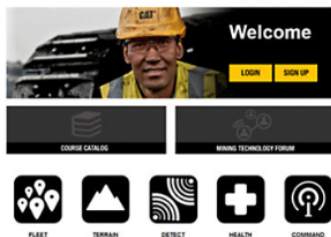
TRAINING COURSE CATALOG



Provides an overview and list of courses available

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MINING TECHNOLOGY ACADEMY



Investing in Cat® MineStar™ products is just the first step in building business value at your site. Utilizing Cat MineStar to its full potential can help enhance safety, reduce costs, improve productivity and boost efficiency. That's why the MineStar team provides a comprehensive suite of training opportunities that allows users to build skills from foundational to expert through web-based, instructor-led and on-the-job courses.

Training is based around job roles at either the customer site or the dealership, ensuring that users are trained on the functions they need to be effective and efficient in their daily work. Training spans the MineStar suite of products—Fleet, Terrain, Detect, Health and Command—and can be scheduled in combination or individually to allow your operation the flexibility and scalability it needs to be more productive, efficient and safe.

TYPES OF TRAINING:

Web-based Training

Also called eLearning, this method is the most portable and allows users to learn via videos, interactive digital courses, and other media types on a desktop, laptop or mobile/tablet device. Web-based training is usually foundational-level content.

Instructor-led

Instructor-led courses allow users to learn with others in a classroom environment with a subject matter expert and standardized materials. Our instructor-led training consists of interactive system exercises to equip users for real-world application of the products.

Simulation

Simulation training takes the classroom one step further and allows users to apply hands-on learning in an environment that mimics mine control operations. This type of instruction allows users to make mistakes and learn the system without having a negative impact on production.

On-the-job/ Practical

To gain familiarity with site specific procedures, we encourage on-the-job shadowing after completing training so that users can apply what they've learned to real-world application at their site.

To request training please complete our [Mining Technology Training Request Form](#).

How to Read a Course Description

The bulk of the information in this Training Course Catalog is the detail about specific courses, so this tool is increasingly important to you as you come closer to registration. Below is a typical example of the information you can find about each course, followed by some comments on what you should be looking for as you scan the Training Course Catalog, and start to think about courses that you might want to take. This course is a good example of the information you can learn about a course from the Training Course Catalog:



FLTOF100: Product Overview & Client Pages/Consoles/Desktops (F)

Provides a high-level overview of the MineStar system modules and components including types and categories of information the system provides. Hands-on component focuses on system familiarity including logging on, logging off, navigating the MineStar systems, and setting up personalized pages, screens and desktops.

The description starts with an abbreviation of the product and the course number, followed by a descriptive title and then more detailed elements:

-  Indicates this is an eLearning course. You will take this course on your own, online. If this does not appear in front of a course, the course is an ILT (Instructor Led Training) course.
- Course abbreviations (FLTOF)** are sometimes a little cryptic (this one is for Fleet Office), but you will know where you are since you always arrive at a specific course by clicking first on the MineStar Training Offering.
- Course numbers (100)** are always in the 100s, 200s, or 300s, which designate Foundational (100), Intermediate (200), or Expert (300) courses, very generally. Students often find 100 level courses that are excellent introductions to their fields of study, but many 200 level courses are perfectly appropriate for students with no prior knowledge of the field. The 200-level number may just mean the course has a more specific focus than a broad, introductory survey course.
- A course title (Product Overview & Client Pages/Consoles/Desktops)** provides a good shorthand statement of what a course is about. The main title, "Product Overview & Client Pages/Consoles/Desktops," is an intriguing hint that the course will likely focus on the Fleet Office as a whole and the different modules and components within the Fleet Office.
- Skill level ((F))** indicates the skill level obtained with the course; Foundational, Intermediate or Expert. The course in the example is a Foundational course.
- Course descriptions** usually two or three sentences, provides more detailed information about the course. Look here for a sense of major topics covered. In this case, you can see it focuses on how to log in and out and navigating through MineStar as well as some setup instruction.

TRAINING OVERVIEW

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Type of Training:

Web-based Training – Also called eLearning, this method is the most portable and allows users to learn via videos, interactive digital courses, and other media types on a desktop, laptop or mobile/tablet device. Web-based training is usually foundational-level content.



Instructor-led – Instructor-led courses allow users to learn with others in a classroom environment with a subject matter expert and standardized materials. Our instructor-led training consists of interactive system exercises to equip users for real-world application of the products.



Simulation – Simulation training takes the classroom one step further and allows users to apply hands-on learning in an environment that mimics mine control operations. This type of instruction allows users to make mistakes and learn the system without having a negative impact on production.



On-the-job/ Practical – To gain familiarity with site specific procedures, we encourage on-the-job shadowing after completing training so that users can apply what they've learned to real-world application at their site.

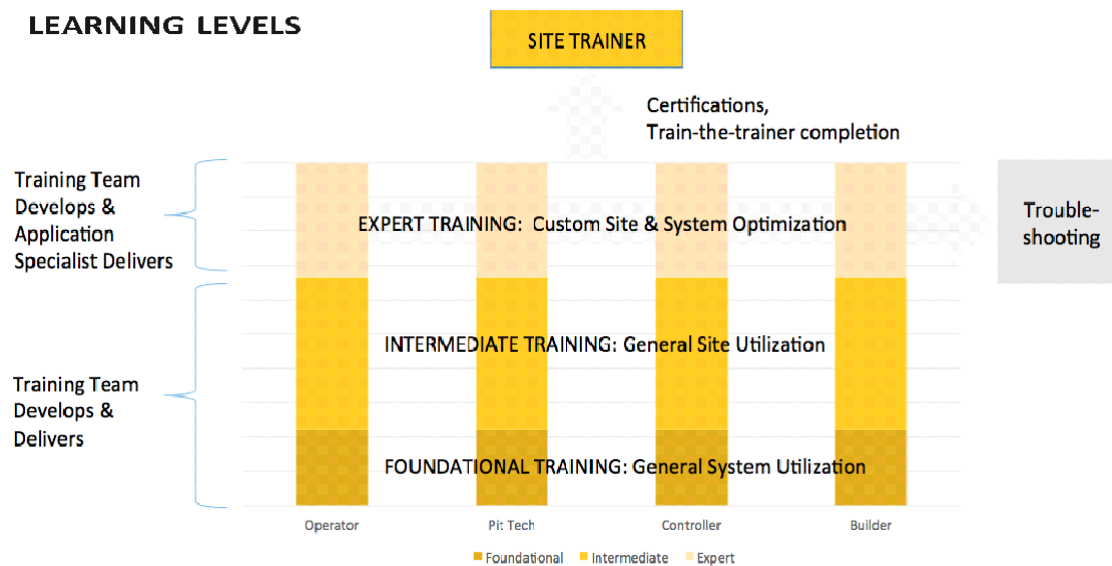
Skill Levels

Foundational – During foundational training, users learn the fundamental functions of the system.

Intermediate – Once users complete foundational training, they can begin to learn how the system is utilized in a mine site application

Expert – Users who have completed foundational and intermediate training often want to know advanced techniques for the system and site optimization and seek out training from deep subject matter experts. Those trained at the expert level can help with on-the-job training for peers and perform advanced troubleshooting.

LEARNING LEVELS





Fleet Office - Controller

Objective:

The purpose of the Fleet Office – Controller training will provide the knowledge and skills a candidate must demonstrate to be deemed competent to utilize the CAT MineStar Fleet system at a mine site. This list contains a recommended training path for controllers. This training path is customizable for each site and learner. This includes but not limited to:

- Identifying the pages and system configurations of the MineStar Fleet system
- Operation of the system
- Best practices
- Initial system setup

Courses Needed:

FLTOF100 - Product Overview (F)
FLTOF110 - Spatial Mine Model Introduction (F)
FLTOF120 - Introduction to Material Tracking (F)
FLTOF130 - Introduction to Assignment (F)
FLTOF140 - Introduction to Fueling and TKPH (F)
FLTOF150 - Introduction to Delays (F)
FLTOF160 - Introduction to Cycles (F)
FLTOF170 - Introduction to Messaging (F)
FLTOF180 - General Processes (F)
FLTOF200 - Spatial Mine Model Building (I)
FLTOF210 - Checking, Monitoring and Moving Machines (I)
FLTOF215 - Fueling and TKPH (I)
FLTOF225 - Material Tracking (I)
FLTOF235 - Assignment (I)
FLTOF240 - Assignment Troubleshooting (I)
FLTOF245 - Delays (I)
FLTOF250 - Cycles (I)
FLTOF255 - Messaging (I)
FLTOF260 - KPI Dashboards and Reporting (I)
FLTOF265 - Field Comms and Onboard Files (I)
FLTOF270 - Operators, Safety Items, Rosters and Shifts (I)
FLTOF275 - Shift Change (I)





Fleet Office - Builder

Objective:

The purpose of the Fleet Office – Builder training will provide the knowledge and skills a candidate must demonstrate to be deemed competent to utilize the CAT MineStar Fleet system at a mine site. This list contains a recommended training path for builders. This training path is customizable for each site and learner. This includes but not limited to:

- Identifying the pages and system configurations of the MineStar Fleet system
- Operation of the system
- Best practices
- Build and maintain the spatial mine model
- System administration

Courses Needed:

FLTOF100 - Product Overview (F)
FLTOF110 - Spatial Mine Model Introduction (F)
FLTOF120 - Introduction to Material Tracking (F)
FLTOF130 - Introduction to Assignment (F)
FLTOF140 - Introduction to Fueling and TKPH (F)
FLTOF150 - Introduction to Delays (F)
FLTOF160 - Introduction to Cycles (F)
FLTOF170 - Introduction to Messaging (F)
FLTOF180 - General Processes (F)
FLTOF200 - Spatial Mine Model Building (I)
FLTOF210 - Checking, Monitoring and Moving Machines (I)
FLTOF215 - Fueling and TKPH (I)
FLTOF225 - Material Tracking (I)
FLTOF235 - Assignment (I)
FLTOF245 - Delays (I)
FLTOF250 - Cycles (I)
FLTOF255 - Messaging (I)
FLTOF260 - KPI Dashboards and Reporting (I)
FLTOF265 - Field Comms and Onboard Files (I)
FLTOF270 - Managing Operators (I)
FLTOF275 - Shift Change (I)
FLTOF300 - System Architecture (E)
FLTOF310 - System Administration (E)
FLTOF320 - Spatial Mine Model Supervisor (E)
FLTOF325 - Adding and Archiving Machines (E)
FLTOF330 - Mining Block Supervisor (E)
FLTOF340 - Assignment Supervisor (E)
FLTOF345 - Drill Cycle (E)
FLTOF350 - Cycle Supervisor (E)



Fleet Service – Level 1

Objective:

The purpose of the Fleet Level 1 Foundational Service Training is to provide the knowledge and skills a candidate must demonstrate to be deemed competent to complete work installing the CAT MineStar Fleet system on a range of machine types. This includes but not limited to:

- Identifying the components and system configurations of the MineStar Fleet system
- Foundational operation of the system
- System connections
- Initial system setup

Courses Needed:

FLTSRV100 - MineStar Fleet Onboard Introduction (F)

FLTSRV110 - Fleet Onboard Operator Overview (F)

GENSRV101 - Resources and Documentation (F)

GENSRV102 - General Harnessing Best Practices (F)

FLTSRV121 - Fleet Onboard Hardware Installation (F)

FLTSRV131 - Fleet Onboard Initial Software Installation (F)

FLTSRV151 - Gen III Fleet Onboard – Foundational (F)

FLTSRV161 - Fleet Onboard for sites with Command for hauling – Foundational (F)

Fleet Service – Level 2

Objective:

The purpose of the Fleet Level 2 Intermediate Service Training is to provide the knowledge and skills a candidate must demonstrate to be deemed competent to complete work as a technician for CAT MineStar Fleet system. This includes but not limited to:

- Installation and configuration of the Fleet Onboard software
- Commissioning the Fleet Onboard system
- Diagnosing and repairing faults with the Fleet Onboard system

Courses Needed:

GENSRV201 - GNSS Fundamentals (I)

GENSRV202 - MineStar Network Communication Fundamentals (I)

FLTOF100 - Product Overview & Client Pages / Consoles / Desktops (F)

FLTOF110 - Introduction to the Spatial Mine Model (F)

FLTOF150 - Introduction to Delays (F)

FLTOF160 - Introduction to Cycles (F)

FLTSRV210 - Fleet Onboard Display Configuration (I)

FLTSRV220 - Fleet Onboard Measure-up and Commissioning (I)

FLTSRV230 - Fleet Onboard Troubleshooting (I)

FLTSRV240 - Fleet Onboard Troubleshooting via the MineStar client (I)

GENSRV203 - Service & Support (I)

FLTSRV250 - For Sites with Gen III(CMPD) Fleet Onboard (I)

FLTSRV260 - For Sites with Command for Hauling (I)



Terrain Office

Objective:

The purpose of the Terrain Office Foundational Course is to provide the knowledge and skills a candidate must demonstrate to be deemed competent to complete work using MineStar Terrain Office client, and the related sub-systems. This includes but not limited to:

- Identifying the different Terrain applications
- Listing the advantages of Terrain equipped sites
- Explaining the functionalities of the Terrain Office and onboard applications
- Describing all system componentry
- Understanding the Terrain Office User Interface
- Listing all Services needed
- Descriptions of Machine Types with specific configurations, and onboard file types
- Using best practices and standard procedures when using all systems required by their role (Terrain for Grading & Loading and Drills, along with Command for Hauling) to promote safe and efficient operations
- Demonstrating proper communication and coordination between all operational roles within the Terrain Office environment

Courses Needed:

TEROF111 - Overview (F)

TEROF115 - User Interface (F)

TEROF120 - Service (F)

TEROF125 - Machines (F)

TEROF130 - Onboard Lists (F)

TEROF135 - Support Process (F)

TEROF140 - Terrain for Drilling User Interface (F)

TEROF145 - Terrain for Drilling Machines (F)

TEROF150 - Terrain for Drilling Onboard Lists (F)

TEROF160 - Terrain for Grading and Loading Material Identification (F)

TEROF155 - Terrain for Drilling Messages (F)

TEROF205 - Terrain Bounding Regions and Groups (I)

TEROF210 - Terrain Grading and Loading Design Files (I)

TEROF215 - Terrain Grading and Loading Design File Management (I)

TEROF220 - Terrain for Drilling Design Files (I)

TEROF225 - Terrain for Drilling Patterns (I)

TEROF230 - Terrain for Drilling Pattern Management (I)

TEROF235 - Terrain Grading and Loading As-Build Surface Files (I)

TEROF240 - Terrain Grading and Loading Manage Projects (I)

TEROF245 - Terrain for Drilling Projects (I)

TEROF250 - Terrain Grading and Loading Avoidance Zone and Surfaces (I)

TEROF255 - Terrain Grading and Loading Avoidance Zone and Surfaces with Remote Control (I)

TEROF260 - Terrain Grading and Loading Automatic ore Status Maintenance (I)

TEROF265 - Terrain Manage Events (I)

TEROF270 - Terrain Reports and Productivity Files (I)

TEROF275 - Terrain for Drilling CAT Reports (I)

TEROF280 - Terrain Advanced Troubleshooting (I)



Terrain Onboard – G&L

Objective:

The purpose of the Terrain Grading & Loading Onboard Foundational Course is to provide the knowledge and skills a candidate must demonstrate to be deemed competent to complete work using the MineStar Terrain onboard systems for Grading & Loading applications. This includes but not limited to:

- Identifying the different onboard uses for Grading & Loading machine types
- Listing the advantages of Terrain equipped machines
- Descriptions of Machine Types with specific configurations and onboard file types
- Describing all onboard system componentry
- Understanding the Terrain Grading & Loading User Interface
- Understanding Procedures to include the Starting of Shift and Shift Activities
- Demonstrating proper material identification for loading purposes

Courses Needed:

TERON100 - Terrain Overview (F)
TERON101 - G&L User Interface (F)
TERON103 - G&L Start of Shift (F)
TERON105 - G&L Shift Activities (F)
TERON108 - Managing Material Information (F)
TERON110 - LHD in GIS Mode (F)

Terrain Service – Drilling – Level 1

Objective:

This course is designed for technicians that support the CAT MineStar Drilling and provides an introduction components, installation and configuration variations for Drill types, and initial software installation.

Courses Needed:

TERSRV100 - Overview of Terrain System (F)
TERSRV101 - Terrain Machine and Software overview (F)
TERON102 - Terrain Drilling User Interface (F)
TERSRV103 – Terrain Installation Preparation (F)

Additional as Required:

GENSRV101 - Resources and documentation (F)
GENSRV102 - General harnessing best practice (F)
TERSRV106 - Terrain Hardware Installation for Articulated Drills (F)
TERSRV107 - Terrain Hardware installation for PLC Drills (F)
TERSRV108 - Terrain Hardware installation for I/O Drills (F)



Terrain Service – Drilling – Level 2

Objective:

This course is designed for technicians and builds on the learning from the Terrain for Drilling foundational course and covers the setup and configuration of the Terrain for Drilling system, calibration and service and support of the system.

Courses Needed:

TEROF111 - Terrain Office Overview (F)
TEROF115 - Terrain User Interface (F)
TERSRV205 - Terrain for Drilling File Structure (I)
TERSRV210 - Terrain for Drilling 6.x Image Backup
TERSRV215 - Terrain for Drilling 7.x Hardware Update
TERSRV220 - Terrain for Drilling 7.x Software Installation
TERSRV230 - Terrain for Drilling Setup and Configuration (F)
TERSRV235 - Terrain for Drilling 7.x Calibration

Additional as Required:

TERSRV225 - Terrain for Drilling 7.x Software Upgrade
TERSRV240 - Terrain for Drilling Strata
GENSRV201 - GNSS Fundamentals (I)
GENSRV202 - Networking Fundamentals (I)
GENSRV203 - MineStar Service and Support (I)

Terrain Service – G&L – Level 1

Objective:

This course is designed for technicians that support the CAT MineStar Terrain for Grading and Loading Onboard system. This course is delivered by eLearning and Instructor led training with an instructional duration of ~25.5 hours (not including additional modules) and introduces components, installation of various system configurations and initial software installation for the system.

Courses Needed:

TERON101 - Terrain G&L User interface (F)
TERSRV100 - Overview of Terrain System (F)
TERSRV101 - Terrain Machine and Software overview (F)
TERSRV105 - Terrain Machines Track Type Tractors (F)
TERSRV111 - Terrain Grading and Loading G610 Software Installation (F)
TERSRV121 - Terrain Grading and Loading Hardware (F)
TERSRV123 - Terrain Loading Hardware for Excavators / Front Shovels (F)

Additional as Required:

TERSRV131 - Terrain Mobile (F)
TERSRV132 - Terrain onboard for sites with Command for Hauling (F)
GENSRV101 - Resources and Support (F)
GENSRV102 - General Routing and Installation of Harness Best Practice (F)

COURSE KEY

F = Foundational

I = Intermediate

E = Expert



= eLearning Available

Terrain Service – G&L – Level 2

Objective:

This course is designed for technicians and builds on the learning from the Terrain for Grading and Loading foundational course. This course is delivered by eLearning and Instructor led training with an instructional duration of ~29 hours (not including additional modules) and covers and introduction to Terrain Office, the configuration of the system, Measure-up and calibration, Measure up and calibration Dual antenna excavator / front shovel machines and service and support of the system.

Courses Needed:

TEROF111 - Overview (F)

TEROF115 - User Interface (F)

TEROF120 - Service (F)

TEROF125 - Machines (F)

TERSRV221 - Terrain G&L Machine Configuration (I)

TERSRV222 - Terrain G&L measure up (I)

TERSRV223 - Terrain G&L Dual antenna excavator and Front shovel calibration (I)

Additional as Required:

TERSRV232 - Terrain sites with Command for Hauling (I)

GENSRV201 - GNSS Fundamentals (I)

GENSRV202 - Network Fundamentals (I)

GENSRV203 – MineStar Service and Support (I)



Terrain Onboard – Drilling

Objective:

The purpose of the Terrain Drilling Onboard Course is to provide the knowledge and skills a candidate must demonstrate to be deemed competent to complete work using the MineStar Terrain Onboard systems for Drilling applications. This includes but not limited to:

- Identifying the different onboard uses for drilling machine types
- Listing the advantages of Terrain equipped machines
- Describing all onboard system componentry
- Understanding the Terrain Drilling User Interface
- Understanding procedures when starting a shift and other shift activities
- Understanding the use of Strata

Courses Needed:

TERON100 - Overview

TERON102 - Drill User Interface

TERON104 - Drilling Start of Shift

TERON106 - Drill Shift Activities

TERON111 - Terrain Strata for Drilling



Command for Hauling – Office/Onboard - SIM

Objective:

The purpose of the Command for Hauling Office/Onboard SIM School is to provide the knowledge and skills a candidate must demonstrate to be deemed competent to complete work using MineStar Command for Hauling, and the related sub-systems. This includes but not limited to:

- Understanding and applying all applicable Safe Work Procedures
- Using best practices and standard procedures when using all systems required by their role (Terrain, Aux Panel, Command for Hauling/Fleet Office, etc.) to promote safe and efficient operations
- Demonstrating proper communication and coordination between all operational roles within the Command for Hauling environment
- Identifying potential issues, and recommending corrective actions, as well as areas for efficiency gains

Courses Needed:

AHS_COMOF100 - Command for Hauling Overview (F)
AHS_COMOF110 - Introduction to Surface Management (F)
AHS_COMOF120 - Introduction to Lanes and Zones (F)
AHS_COMOF130 - Introduction to Load Planning (F)
AHS_COMOF140 - Introduction to Dump Planning (F)
AHS_COMOF150 - Introduction to Stations (F)
AHS_COMOF160 - Introduction to Mine Model Management (F)
AHS_COMOF170 - Introduction to the Autonomy Status Page (F)
AHS_COMOF180 - Introduction to Site Monitor (F)
AHS_COMOF190 - Introduction to the Traffic Management Page (F)
AHS_COMOF199 - Command for Hauling Foundational – VOC (F)
AHS_COMOF200 - Managing Autonomous Traffic (I)
AHS_COMOF205 - Surface Management (I)
AHS_COMOF210 - Surface Editor (I)
AHS_COMOF215 - Lanes (I)
AHS_COMOF220 - Zones (I)
AHS_COMOF230 - Load Planning (I)
AHS_COMOF240 - Dump Planning (I)
AHS_COMOF250 - Stations (I)
AHS_COMOF255 - Refueling (I)
AHS_COMOF260 - Mine Model Management (I)
AHS_COMOF270 - Inside the Office Area (I)
AHS_COMOF280 - Autonomy Status Page (I)
AHS_COMOF285 - Using Site Monitor (I)
AHS_COMOF290 - Traffic Management Page (I)
AHS_COMOF295 - Shift Change (I)
AHS_COMOF299 - Command for Hauling Intermediate – VOC (I)
AHS_COMON100 - Introduction to Autonomous Operations (F)
AHS_COMON110 - Introduction to A-Stop Operation (F)
AHS_COMON120 - Introduction to Operate a Vehicle in the AOZ (F)
AHS_COMON125 - Introduction to Aux Panel Operations (F)
AHS_COMON130 - Introduction to Terrain Grading in the AOZ (F)
AHS_COMON140 - Introduction to Terrain Loading in the AOZ (F)
AHS_COMON150 - Introduction to Operations Inside the AOZ (F)
AHS_COMON160 - Introduction to Mode Changing AMT (F)
AHS_COMON199 - Introduction to Command for Hauling Onboard – VOC (F)
AHS_COMON200 - Inside the AOZ (I)
AHS_COMON210 - Mode Changing and Refueling AMT (I)



Command for Hauling – Service – Level 1

Objective:

This course is designed for Autonomous Technicians, trainers and supervisors that install the CAT Command for Hauling system in the Workshop and in the Autonomous Operating Zone. Training is role based but can include the following modules:

Courses Needed:

AHS_COMSRV100 - Introduction to CAT Autonomous Haulage System (F)
AHS_COMSRV110 - Base Machine Considerations (F)
AHS_COMSRV130 - GNSS Fundamentals (F)
AHS_COMSRV140 - Networking Fundamentals (F)
AHS_COMSRV150 - 793F Command Assembly (F)
AHS_COMSRV160 - 793F Command Maintenance and Service (F)
AHS_COMSRV170 - Introduction to MineStar Client (Autonomy) (F)
AHS_COMSRV180 - Field Troubleshooting and Repair (F)
AHS_COMSRV199 - Onsite Exposure and Competency Journal (F)

Additional as Required:

TERSRV100 - Overview of Terrain System (F)
TERSRV101 - Terrain Machine and Software overview (F)
TERSRV102 - GNSS Fundamentals for Terrain (F)
TERSRV103 - Terrain Installation Preparation (F)
TERSRV106 - Terrain Hardware Installation for Articulated Drills (F)
TERSRV107 - Terrain Hardware installation for PLC Drills (F)
TERSRV108 - Terrain Hardware installation for I/O Drills (F)
TERSRV113 - Terrain for Drilling Setup and Configuration (F)
TERSRV114 - Drill Calibration (F)
TERSRV201 - Terrain Office Installation (I)
FLTDRV100 - MineStar Fleet Onboard Introduction (F)
FLTDRV110 - Fleet Onboard Operator Overview (F)
FLTDRV121 - Fleet Onboard Hardware Installation (F)
FLTDRV131 - Fleet Onboard Initial Software Installation (F)
FLTDRV151 - Gen III Fleet Onboard – Foundational (F)
FLTDRV161 - Fleet Onboard for sites with Command for hauling – Foundational (F)
AHS_COMON200 - Inside the AOZ (Command Office Team) (I)
AHS_COMON210 - Mode Changing and Refueling AMT (I)

Command for Hauling – Service – Level 2

Objective:

This course is designed for Autonomous Technicians, trainers and supervisors that setup, configure, calibrate and troubleshoot the CAT Command for Hauling system in the Office, workshop and in the Autonomous Operating Zone. Training is role based but can include the following modules:

Courses Needed:

AHS_COMSRV200 - Command for Hauling - Check Driving an AMT Locations (I)
AHS_COMSRV210 - Using the AMT (I)
AHS_COMSRV220 - Setup, Configuration, Calibration of an Autonomous Mining Truck(I)
AHS_COMSRV230 - Setup, Configuration, Calibration (OJT) (I)



Command for Underground MXZ

Objective:

The purpose of the Command for Underground MXZ - Service Training is to provide the knowledge and skills a candidate must demonstrate to be deemed competent to diagnose, repair, configure and troubleshoot the system. This includes but not limited to:

- Identifying the components and system configurations of the Command for Underground MXZ
- Foundational operation of the system
- System connections
- Initial system setup
- Troubleshooting

Courses Needed:

UG_COMAA-MXZL100 – Automation Area Overview (F)

UG_COMAA-MXZL200 – Area Isolation System Overview (I)

UG_COMAA-MXZL200 – Local Area Radio Network Overview (I)

UG_COMAA-MXZL210 – LARN Components and Operation (I)

UG_COMAA-MXZL300 – Area Isolation System (E)

UG_COMMAS200 – Machine Automation System Components and Operation - Lite (I)

UG_COMMAS200 – Machine Automation System Components and Operation (I)

UG_COMMAS300 – Machine Automation Remote Control Systems - Lite (E)

UG_COMMAS300 – Machine Automation Remote Control Systems (E)

UG_COMOP200 – Operations (I)

UG_COMROS200 – Operator Station - Hardware (I)

UG_COMROS300 – Operator Station - Software (E)

UG_COMSYS300 – MAS Operations Training (E)



Command for Dozing (SATS) - Service

Objective:

The purpose of the Command for Dozing SATS - Service Training is to provide the knowledge and skills a candidate must demonstrate to be deemed competent to complete work installing the Command for Dozing SATS system on a range of machine types. This includes but not limited to:

- Identifying the components and system configurations of the Command for Dozing SATS
- Foundational operation of the system
- System connections
- Initial system setup
- Troubleshooting

Courses Needed:

DOZ_COMSRV102 - Hardware Component Overview for CFD (F)

DOZ_COMSRV103 - CFD: Installing Hardware for Remote-Control (F)

DOZ_COMSRV106 - Install Vision System (F)

DOZ_COMSRV107 - Installing Software on the Machine (F)

DOZ_COMSRV108 - Install Software on and Calibrate the Operator Station (F)

DOZ_COMSRV109 - Calibrating, Operating, and Commissioning the Operator Console (F)

DOZ_COMSRV200 - Basic Operator Station Functions (I)

DOZ_COMSRV300 - Commissioning and Troubleshooting CFD Systems (E)

Command for Dozing (SATS) - Operator

Objective:

This course is designed for key concepts of training on using the Operator Station to operate a track-type tractor through remote control; it details topics including comparison between Operator Station RC vs. SATS, working with the Vision System, Terrain with Blade Control and SATS Automated Features and shift procedures.

Courses Needed:

DOZ_COMOSOP100 - Operator Station for Operators (F)

DOZ_COMSATS401 - SATS for Operators (E)



Command for Dozing Remote Station - Operator

Objective:

The purpose of the Command for Dozing Remote Station - Operator Training is to provide the knowledge and skills a candidate must demonstrate to be deemed competent to Start up and operate the Command for Dozing Remote Operator Station on a range of machine types. This includes but not limited to:

- Identifying the components and system configurations of the Command for Dozing Remote Station system
- Foundational and intermediate operation of the system
- Basic Troubleshooting of the system

Courses Needed:

DOZ_COMOSOP100 - Operator Station for Operators (F)

Command for Dozing Remote Station - Service

Objective:

The purpose of the Command for Dozing Remote Station - Service Training is to provide the knowledge and skills a candidate must demonstrate to be deemed competent to complete work installing the Command for Dozing Remote Station system on a range of machine types. This includes but not limited to:

- Identifying the components and system configurations of the Command for Dozing Remote Station system
- Foundational operation of the system
- System connections
- Initial system setup

Courses Needed:

DOZ_COMSRV102 - Hardware Component Overview for CFD (F)

DOZ_COMSRV103 - CFD: Installing Hardware for Remote-Control (F)

DOZ_COMSRV106 - Install Vision System (F)

DOZ_COMSRV107 - Installing Software on the Machine (F)

DOZ_COMSRV108 - Install Software on and Calibrate the Operator Station (F)

DOZ_COMSRV109 - Calibrating, Operating, and Commissioning the Operator Console (F)

DOZ_COMSRV200 - Basic Operator Station Functions (I)

DOZ_COMSRV300 - Commissioning and Troubleshooting CFD Systems (E)



Command for Dozing Remote Console - Operator

Objective:

The purpose of the Command for Dozing Remote Console- Operator Training is to provide the knowledge and skills a candidate must demonstrate to be deemed competent to Start up and operate the Command for Dozing Remote Operator Console on a range of machine types. This includes but not limited to:

- Identifying the components and system configurations of the Command for Dozing Remote Console system
- Foundational and intermediate operation of the system
- Basic Troubleshooting of the system

Courses Needed:

DOZ_COMOCOP100 - CFD: Operator Console for Operators (F)

Command for Dozing Remote Console - Service

Objective:

The purpose of the Command for Dozing Remote Console - Service Training is to provide the knowledge and skills a candidate must demonstrate to be deemed competent to complete work installing the Command for Dozing Remote Console system on a range of machine types. This includes but not limited to:

- Identifying the components and system configurations of the Command for Dozing Remote Console system
- Foundational operation of the system
- System connections
- Initial system setup

Courses Needed:

DOZ_COMSRV102 - Hardware Component Overview for CFD (F)

DOZ_COMSRV103 - CFD: Installing Hardware for Remote-Control (F)

DOZ_COMSRV300 - Commissioning and Troubleshooting CFD Systems (E)



FLEET

TRACK, MANAGE AND ASSIGN ALL TYPES OF EQUIPMENT, ACROSS ONE SITE OR MANY

Fleet enhances the management of all types of equipment operations, across one mine site or multiple sites. It also allows you to easily drill down for more detailed views and analysis, from reporting on selectable groups of assets down to individual machines.

FLTOF100: Product Overview & Client Pages/Consoles/Desktops (F)

Provides a high-level overview of the MineStar system modules and components including types and categories of information the system provides. Hands-on component focuses on system familiarity including logging on, logging off, navigating the MineStar systems, and setting up personalized pages, screens and desktops.

FLTOF110: Introduction to the Spatial Mine Model (F)

This course introduces and defines the concept and functions of mine model entities and will introduce the Site Editor and Site Monitor pages.

FLTOF120: Introduction to Material Tracking (F)

This course covers the concept of grades, materials and mining blocks, and identifies what a controller should review when checking mining blocks.

FLTOF130: Introduction to Assignment (F)

This course covers assignment groups as well as some of the pages used when generating, monitoring and troubleshooting assignments such as Assignment Event Monitor, Mine Model Query, Trucking Indication and Travel Progress Monitor. This course is intended to provide familiarity with Assignments and some assignment related pages.

FLTOF140: Introduction to Fueling and TKPH/TMPH (F)

This course provides an overview of the Fueling and TKPH functions within Fleet Office.

FLTOF150: Introduction to Delays (F)

This course covers the Time Usage Model, the delay concept and Delay Monitor, as well as how to create and edit delays.

FLTOF160: Introduction to Cycles (F)

This course is an introduction to cycles, covering the concept and contents of cycles, Cycle Monitor, Cycle Assistant, and some basic cycle editing instructions and tips.

FLTOF170: Introduction to Messaging (F)

This course covers how to send messages from within Fleet Office, as well as the Office Message Monitor page.

FLTOF180: General Processes (F)

This course covers process such as the support processes and contacts, handover, how to use VNC, Phindows and Remote Tools, communicating changes and issues, how to take a snapshot and where to find additional help.

FLTOF200: Spatial Mine Model Building (I)

that make up a mine model. Participants will upload a DXF file, and create waypoints, roads and destinations. Concepts such as functionality and settings will also be covered.

**FLEET****OFFICE****FLEET****FLTOF205: Adding and Archiving Machines (I)**

This course covers adding machine classes and individual machines including loading tools, processors and trucks. A loading tool and processor will be added that will work with the already existing truck fleets.

FLTOF210: Checking, Monitoring and Moving Machines (I)

This course covers pages and settings used to manage machines as well which settings should be reviewed throughout shift and when moving machines.

FLTOF215: Fueling and TKPH (I)

Fueling is one of the areas where the Assignment engine can be used to improve efficiency and productivity. This course covers how to input fuel entries, as well as fuel settings and their impact. It also covers TKPH - how it can be monitored by Fleet Office and how it can affect assignments.

FLTOF225: Material Tracking (I)

This course provides insight to the material tracking and monitoring component of MineStar Fleet Office and how the MineStar Terrain capability package interact with each other. This course provides insight to the material tracking component of Fleet Office and covers blending, adding grades, materials and mining blocks.

FLTOF235: Assignments (I)

The Assignment Engine is one of Fleets most powerful features. In this course, you will have demonstrated how the assignment engine works and how to interact with it. This course will cover machine availability and assignability, restrictions, why assignment may choose one loading tool over another, queue tolerance and making and scheduling assignments.

FLTOF240: Assignment Troubleshooting (I)

This course will cover the pages within Fleet Office that aid in diagnosing and troubleshooting assignment issues, as well as tips and tricks to quickly find the root cause.

FLTOF245: Delays (I)

The understanding and correct use of delays is critical for everything from reporting to assignments. This course covers adding delay types and activities (for advanced roles) and managing current and historical delays within Fleet Office.

FLTOF250: Cycles (I)

The data contained within cycles is used heavily by various departments so maintaining accurate cycle data is crucial. This course covers how to monitor and edit cycles to ensure accurate data is being recorded.

FLTOF255: Messaging (I)

Messages can be sent to and from the office and machines. Messages can be free form or predetermined depending on a site's needs and preferences. This course covers how to create and send messages

FLTOF260: KPI Dashboards and Reporting (I)

This course covers viewing the KPI dashboards, adjusting dashboard targets, recalculating KPI summaries, running standard reports, scheduling reports and adjusting reporting targets.

**FLTOF265: Field Comms and Onboard Files (I)**

This course covers the component of MineStar communications that includes field and load events. Participants will gain a better understanding of how MineStar transfers data which will help when troubleshooting issues.

FLTOF270: Operators, Safety Items, Rosters and Shifts (I)

This course covers how to add system users, machine operators, licenses, personal details, preferences, shifts, crews and rosters to better manage personnel. This course also covers creating and managing safety checklists displayed on the onboard display.

FLTOF275: Shift Change (I)

This course reviews and provides suggested guidelines for handover/change of shift processes. It also covers how the Shift Change tool within Fleet Office functions and can improve the efficiency of shift change.

FLTOF300: System Architecture (E)

This course steps participants through the system architecture in which the Cat MineStar Systems operate. This course also covers an introduction to supervisor and the file folders in which lie and the components which effect the operation of the system.

FLTOF310: System Administration (E)

This course contains various technical tasks including ensuring database cleanup and file deletion is occurring, reviewing the bus monitor and service logs, installing Fleet Office Client, activating data loggers, checking data retention, and taking, sending and creating automating snapshots.

FLTOF320: Spatial Mine Model Supervisor (E)

This course steps participants through setting up the elements that make up a mine model. Participants will upload a DXF file, and create waypoints, roads and destinations. Concepts such as functionality and settings will also be covered.

FLTOF325: Adding and Archiving Machines (E)

This course covers adding machine classes and individual machines including loading tools, processors and trucks. A loading tool and processor will be added that will work with the already existing truck fleets.

FLTOF330: Mining Block Management (E)

This course covers mapping for PLY and PTS files, as well as how to create, update, and import mining blocks. In addition, this course provides insight into checking PLY and PTS files, as well as common scenarios that may occur while importing mining blocks and working with PLY and PTS files.

FLTOF340: Assignment Supervisor (E)

This course steps participants through setting up the elements that effect the decisions the Assignment Engine makes for assigning trucks on the most efficient routes throughout the mine site.

FLTOF345: Drill Cycles (E)

This course steps participants through all the elements that make up a drill cycle. In addition, this includes the drill cycle states and the triggers for these states.

FLTOF350: Cycle Supervisor (E)

This course steps participants through setting up the elements that effect the cycle creation and requirements for cycle assist within the client. In addition, it also includes bulk cycle editing and thresholds.

Mining Technology Courses Descriptions

COURSE KEY

F = Foundational

I = Intermediate

E = Expert



= eLearning Available

FLEET

ONBOARD

FLTON100: Operator Onboard Overview (F)

This training course outlines the necessary operating skills for Machine Operators using the product, operating techniques and procedures. Advanced techniques will develop as the Operator gains knowledge of the product and its capabilities.

FLTON200: Fleet Onboard System Fundamentals (I)

This course describes in detail the Fleet Onboard System Features and Functionalities.

FLTON300: Onboard User Operational Procedures (I)

This course describes the Fleet Onboard Operator Utilities, Operational Techniques and Procedures. The Machine Operator will perform navigational tasks.

FLTON400: Fleet Onboard System Maintenance (I)

This course describes the Fleet Onboard Operator Utilities, Operational Techniques and Procedures. The Machine Operator will perform navigational tasks.

FLTON500: Troubleshooting the Fleet Onboard System (I)

This course explains how to troubleshoot Fleet Onboard faults.

FLTSRV100: MineStar Fleet Onboard Introduction (F)

This course is an introduction to the Fleet Onboard System. It provides an overview of MineStar Fleet and how it fits into the site's operations and its effect on site roles. The Fleet system components are covered as well as the benefits and advantages of using Fleet.

FLTSRV110: Operator Onboard Overview (F)

This course explains how an Operator uses the Fleet onboard screen to log in and out, view assignments, messages, activate delays, etc. It also shows a brief overview of how a MineStar Controller uses the office software to manage assignments.

FLTSRV120: GNSS Fundamentals (F)

This course covers the basics of the Global Navigation Satellite System (GNSS) theory and how MineStar utilizes GNSS and a base station for high accuracy positioning. Participants will gain an understanding of common GNSS terminology, what a base station is and how corrections work, the different positioning solutions available, the status lights of a GNSS receiver and some common error sources.

FLTSRV121: Fleet Onboard Hardware Installation (F)

Participants will understand the components that make up the Fleet Onboard system. Understand the component variations and which variation is correct per machine. Identify typical locations, mounting configuration and safety considerations for the mounting the components. They will also be able to understand and demonstrate how to install and connect the various components.

FLTSRV130: Networking Fundamentals (F)

Participants will learn the basics of how MineStar utilizes different networks to send and receive messages and files between the office software and the Fleet onboard components. Common terminology and basic troubleshooting techniques are also covered.

FLTSRV131: Fleet Onboard Initial Software Installation (F)

Participants will be able to identify the correct software to install on the system and the correct service tools used during installation. Demonstrate the procedure to install software on the various components, the steps to initially configure the various components and test the initial functionality of the system.

SERVICE

FLEET

**FLEET****SERVICE****FLEET****FLTSRV140: CAN Protocol (F)**

This course explains what the CAN Protocol is, how it functions, and how it is used by MineStar Fleet Onboard to receive GPS and VIMS information.

FLTSRV151: Gen III Fleet Onboard – Foundational (F)

This course explains how an Operator uses the Fleet onboard screen to log in and out, view assignments, messages, activate delays, etc.

FLTSRV161: Fleet Onboard for sites with Command for hauling – Foundational (F)

This course explains how an Operator uses the Fleet onboard screen to log in and out, view assignments, messages, activate delays, etc.

FLTSRV203: Fleet Onboard Components (GEN III) (I)

This course covers the components that make up the Gen III Fleet Onboard system. Block diagrams, component descriptions and operation of each is explained.

FLTSRV204: Fleet Onboard Components (GEN IV) (I) - Instructor Materials

This course covers the components that make up the Gen IV Fleet Onboard system. Block diagrams, component descriptions and operation of each is explained.

FLTSRV210: Fleet Onboard Display Configuration (I)

This course covers the configuration of the Fleet Onboard display, provides an understanding of the various configuration file, and covers the process to update the configuration both on and off the machine.

FLTSRV214: Fleet Onboard Installation Locations (GEN IV) (I)

This course covers typical mounting locations for the Fleet onboard hardware for various machine types, mounting requirements for each component, brackets and harness installation standards and where to find serial numbers and software versions.

FLTSRV220: Fleet Onboard Measure-up and Commissioning (I)

This course covers how to perform a Fleet machine measure up, validate its reported position in MineStar compared to its actual position and confirm that all necessary information is entered into the system before it is used in the Active Mining Area.

FLTSRV224: Fleet Onboard Maintenance and Support (GEN IV) (I)

This course covers how to maintain the Fleet onboard system, how to replace faulty components, the different support networks available and information required when returning failed components to the Dealer.

FLTSRV230: Fleet Onboard Troubleshooting (I)

This course covers troubleshooting tools available for Fleet Onboard, basic troubleshooting techniques and common issues.

FLTSRV234: Fleet Onboard Commissioning (GEN IV) (I)

Participants will learn how to measure up a Fleet machine, validate its reported position in MineStar compared to its actual position, and confirm that all necessary information is entered into the system before it is used in the Active Mining Area.

Mining Technology Courses Descriptions

COURSE KEY

F = Foundational

I = Intermediate

E = Expert



= eLearning Available

FLEET

FLTSRV240: Fleet Onboard Troubleshooting via the MineStar client (I)

This course covers how to utilize the MineStar client to remotely troubleshoot issues with the Fleet Onboard system.

FLTSRV244: Onboard Troubleshooting (GEN IV) (I)

This course covers troubleshooting tools available for Fleet onboard, basic troubleshooting techniques and common issues.

FLTSRV250: For Sites with Gen III(CMPD) Fleet Onboard (I)

This course covers troubleshooting tools available for Fleet onboard, Gen III (CMPD) display hardware and basic troubleshooting techniques for common issues. This course is optional for dealers that still support sites using the GEN III display.

FLTSRV260: For Sites with Command for Hauling (I)

This course covers intermediate topics that are specific to sites that utilize Fleet Onboard in a Command for Hauling environment.

FLTSRV304: Fleet Onboard Installation (GEN IV) (E)

This course covers kit preparation and pre-installation checks/testing, how to identify suitable mounting locations for components, common brackets used (plus drilling and tapping/weld bosses/nut and bolt options), wiring standards, schematic use and post installation testing.

FLTSRV314: Onboard Setup and Configuration (GEN IV) (E) Participants will learn how to flash software to components, ensure that the software is functioning correctly and that each individual component is configured correctly for the site.

FLTSRV324: Fleet Onboard Upgrades (GEN IV) (E)

This course covers the typical upgrade process, documentation required, how to backup files, how to locate and install the latest software versions and validating the upgrade.

FLTSRV334: Fleet Onboard Troubleshooting (GEN IV) (E)

This course covers more advanced troubleshooting for Fleet Onboard.

SERVICE

FLEET



FLEET

GENERAL SERVICE

GENSRV101: Resources and Documentation (F)

This course provides an overview of how to locate documentation, software, and other service resources associated with Fleet, Terrain and Command

GENSRV102: General Harnessing Best Practices (F)

This course provides best practices for handling and routing harnesses as well as overviews and troubleshooting for various harness and cable types.

GENSRV201: GNSS Fundamentals (I)

This course explains the operation of the Global Navigation and Satellite System (GNSS) and how Cat ® MineStar™ utilizes this system.

GENSRV202: MineStar Network Communication Fundamentals (I)

This course explains the fundamentals needed to understand networking terminology, operation, and troubleshooting as it relates to the various MineStar systems.

GENSRV203: Service & Support (I)

This course covers the service and support processes that are in place to identify issues, capture the correct data, and submit issues to Caterpillar support teams.

FLEET



TERRAIN

With powerful tools that aid in everything from drill planning to blasting to ore control and mine planning, Terrain enables more timely and effective fact-based management of all drilling, grading and loading applications.

TEROF111: Overview (F)

Overview of Terrain Office showing how Terrain fits into the site's operation and its effect on site roles. The Terrain system components are covered as well as the benefits and advantages of using Terrain.

(old course code: TEROF100)

TEROF115: User Interface (F)

This course covers how to use the Terrain Office user interface. As Terrain Office contains many functions and features, the mechanics of these are explained in this course, such as logging in and out of the office, navigating recorded data of the machines and handling CAT files inside the Terrain Office file manager.

(old course code: TEROF101)

TEROF120: Service (F)

This course displays the services used in Terrain Office in a diagram. It illustrates the flow of information in the different components of Terrain Office such as the Server application, Terrain database, Thin App Clients and Thick App Clients for it to work.

TEROF125: Machines (F)

This course covers the process of creating models, adding, removing, configuring and shutting down machines using Terrain Office. The use and configuration of machines in the Machine Configuration Utility (MCU) tool are also covered in this course. Important details are also included in this course regarding the naming of machines, models, and setting of security keys as well as trouble shooting some items inside the MCU.

TEROF130: Onboard Lists (F)

This course contains the step-by-step process on creating groups and items. The MWF files presented and used in this course illustrate how Terrain Office communicates with machines. Simulations are included in the course to give the learners the opportunity to go through the different steps of creating and maintaining Onboard Groups and List items.

TEROF140: Terrain for Drilling User Interface (F)

This course will walk the learners through logging in and out of Terrain Office, accessing the Help Menu, viewing and understanding the Drill Hole legend, using GPS replay to display data and using the Transfer status panel to view transfer details.

TEROF145: Terrain for Drilling Machines

By enrolling in this course, participants will learn how to use the machine monitor to filter and view machine information, add, remove, and restore machines, and manually mark a machine as shutdown.

TEROF150: Terrain for Drilling Onboard Lists (F)

This course will enable learners to use the different Onboard List Groups in Terrain, as well as create, edit, archive, and restore onboard list items. They will also learn how to generate MWF lists and machine list types.

**TEROF160: Terrain for Grading and Loading Material Identification (F)**

Learners will go through basic troubleshooting activities in this course, while learning about material identification, material grade types, and options for material identification.

TEROF155: Terrain for Drilling Messages (F)

This course will enable learners to create custom or use message templates and send them to machines.

TEROF205: Terrain Bounding Regions and Groups (I)

This course will explain the uses and importance of Bounding Regions and teach the learners how to create, manage, and configure groups.

TEROF210: Terrain Grading and Loading Design Files (I)

This course provides the different steps in converting design files into elevation design files, creating a material grade file, creating Avoidance Zone and Avoidance Zone Surfaces, and converting CAT files into DXF, NEE, and ENE files.

TEROF215: Terrain Grading and Loading Design File Management (I)

Design files and its management are covered in this course. Learners will go through the process of uploading and converting design and overall Terrain Office file management.

TEROF220: Terrain for Drilling Design Files (I)

This course will cover important topics on Drilling design files such as viewing drill patterns, send a drill pattern to a machine, and edit and adjust drill holes in a drill file.

TEROF225: Terrain for Drilling Patterns (I)

This course provides a description of AQM files and discusses the steps in uploading an AQM file to Terrain Office, viewing, editing, and adjusting drill holes in a drill file.

TEROF230: Terrain for Drilling Pattern Management (I)

This course covers the important Terrain Drilling pattern requirements and will cover how to upload, view, and edit drill patterns and artifacts.

TEROF235: Terrain Grading and Loading As-Build Surface Files (I)

This course will teach the learners how to create current elevation design files and send an update layer to a machine.

TEROF240: Terrain Grading and Loading Manage Projects (I)

This course elaborates on the benefits of the Manage Projects feature and will demonstrate how to Terrain machines can request a project.

TEROF245: Terrain for Drilling Projects (I)

The uses and benefits of projects are discussed in module. Learners will also learn how to create, send, edit, and restore projects.

TEROF250: Terrain Grading and Loading Avoidance Zone and Surfaces (I)

Learners will understand the concept and importance of Avoidance Zones and Surfaces in promoting safety in the mine site. They will also learn how to configure avoidance zones and surfaces.



TERRAIN

TEROF255: Terrain Grading and Loading Avoidance Zone and Surfaces with Remote Control (I)

This course is similar to TEROF250 but with an explanation on Command for Dozing integration with Terrain.

TEROF260: Terrain Grading and Loading Automatic ore Status Maintenance (I)

Participants will be taught how to configure AOSM and material file storage onboard.

TEROF265: Terrain Manage Events (I)

Learners will go through the steps in configuring Exports in Terrain in this course.

TEROF270: Terrain Reports and Productivity Files (I)

Participants will learn about setting up the Productivity files in Terrain Office.

TEROF275: Terrain for Drilling CAT Reports (I)

As the learner goes through this course, they will learn how to use the Cat Editor to modify the site's production data. They will also be taught how to run standard reports in Cat Reports, set up parameters, and validate that data exports occur.

TEROF280: Terrain Advanced Troubleshooting (I)

This course will teach participants troubleshooting steps while using Terrain Office. This includes pinging a machine, rebooting, using a trace route, reviewing disk space, and connecting to VNC and Phindows.

ONBOARD

TERON100: Terrain Overview (F)

Overview of Terrain Office showing how Terrain fits into the site's operations and its effect on site roles. The Terrain system components are covered as well as the benefits and advantages of using Terrain.

TERON101: G&L User Interface (F)

Overview of the Grading use interface and Loading user interface. The course also includes how avoidance zones are used in Terrain as well as position awareness information in the user interface.

TERON102: Drill User Interface (F)

Overview of the Drill user interface including drill screens, faults and key terms. Users will be able to identify key components of the user interface and make display adjustments such as brightness, units and language settings.

TERON103: G&L Start of Shift (F)

This course covers some routine tasks at the start of shift including: logging in, completing an operator checklist, entering service hours, job codes, activity codes and working with delays. It also covers confirming communications and GPS connectivity. Learners will be able to request surface updates and create or modify flat planes and inclined planes.

TERON104: Drill Start Shift (F)

This course covers some routine tasks at the start of shift including: logging in, completing an operator checklist, entering service hours, job codes, activity codes and working with delays. It also covers requesting a project, identifying hole information and confirming GPS accuracy.

TERRAIN



TERRAIN

TERON105: G&L Shift Activities (F)

This course covers messaging and productivity information and events recorded by Terrain. Users will also learn how to review machine and operator productivity information.

TERON106: Drill Shift Activities (F)

Participants will learn how to use the onboard system to tram to holes, level the drill and drill a hole. The course covers monitoring strata data, inclined data processes, working with consumables and creating a drill pattern. Participants will be able to identify fault codes, respond to alarms and check reports and statistics.

TERON107: Terrain with Blade Control (F)

This course covers Blade Control features and functions. Participants will be able to identify system components, user interface components and describe how to operate the Blade Control modes.

TERON108: Managing Material Information (F)

This course covers the file types that are used for material or ore applications and explains how to select materials. Participants will learn how to identify mining in progress and mined out of information and work with alternate materials and material modifiers, and how to work with truck functions.

TERON110: LHD GIS Mode (F)

This course covers GIS Mode in Terrain including the user interface and associated GIS Mode icons. It also covers the three modes of operation in GIS Mode: Load, Haul & Dump.

TERSRV100: Overview of Terrain System (F)

Overview of Terrain Office showing how Terrain fits into the site's operations and its effect on site roles. The Terrain system components are covered as well as the benefits and advantages of using Terrain.

TERSRV101: Terrain Machines & Software Overview (F)

Overview of Terrain machines and the Terrain system hardware components used for each type of machine. Foundational overview of the onboard and office file structures.

TERSRV102: GNSS Fundamentals for Terrain (F)

Participants will learn about the fundamentals of GNSS and the types and accuracy of GNSS solutions. Coordinate systems and site calibrations are also covered.

TERSRV103: Terrain Installation Preparation (F)

This course covers the resources that are required for a Terrain installation including: Caterpillar documentation, site resources, infrastructure requirements, hardware requirements, software requirements and required site specific information.

TERSRV104: Terrain Hardware Installation Process for Motor Graders, Wheel Dozers & Wheel Loaders (F)

Participants will learn safety precautions and the Terrain hardware installation processes for motor graders, wheel dozers and wheel loaders.

TERSRV105: Terrain Hardware Installation Process for ARO TTT's (F)

Participants will learn safety precautions and the Terrain hardware installation processes for ARO TTT's.

TERSRV106: Terrain Hardware Installation Process for Articulated Drills (F)

Participants will learn safety precautions and the Terrain hardware installation processes for Articulated drills.

SERVICE

TERRAIN



TERRAIN

SERVICE

TERSRV107: Terrain Hardware Installation Process for PLC Drills (F)

Participants will learn safety precautions and the Terrain hardware installation processes for PLC drills.

TERSRV108: Terrain Hardware Installation Process for I/O Drills (F)

Participants will learn safety precautions and the Terrain hardware installation processes for I/O drills.

TERSRV109: Hardware Installation for Excavators (F)

Participants will learn safety precautions and the Terrain hardware installation processes for excavators.

TERSRV110: Measure-Up G&L Machines (F)

This course covers the considerations that should be taken when performing machine measurements, documentation, identify machine origin joints, how to perform a machine GPS validation and how to enter machine measurements.

TERSRV111: Terrain Grading and Loading G610 Software Installation (F)

This course covers the preparation, installation and registration steps for installing the Terrain Onboard software for G&L machines.

TERSRV112: Terrain G&L Machine Configuration (F)

Participants will learn how to set up machines in the MCR, configure advanced onboard features and use the MCU Help. They will learn how to resolve errors in configuration in the MCU, configure machines to display material and configure swath points.

TERSRV115: Terrain Service & Support (F)

Participants will learn how to view machine information in the database as well as Cat applications to work with this data. The course also covers the Caterpillar 7 Step Diagnostic Process, general troubleshooting and the Caterpillar Support Tiers.

TERSRV121: Terrain Grading and Loading Hardware (F)

This course covers the resources that are required for a Terrain installation including Caterpillar documentation, site resources, infrastructure requirements, hardware requirements, software requirements and required site specific information.

TERSRV123: Terrain Loading Hardware for Excavators / Front Shovels (F)

This course covers the resources that are required for a Terrain installation including Caterpillar documentation, site resources, infrastructure requirements, hardware requirements, software requirements and required site specific information.

TERSRV131: Terrain Mobile (F)

This course covers the resources that are required for a Terrain installation including Caterpillar documentation, site resources, infrastructure requirements, hardware requirements, software requirements and required site specific information.

TERSRV132: Terrain Onboard for sites with Command for Hauling (F)

This course covers the resources that are required for a Terrain installation including Caterpillar documentation, site resources, infrastructure requirements, hardware requirements, software requirements and required site specific information.

TERRAIN

**TERSRV201: Terrain Office Installation (I)**

This course covers the required preparation documentation and process for installing Terrain Office. Terrain Office system components, user roles and the user interface are also covered.

TERSRV205: Terrain for Drilling File Structure (I)

This course covers the Terrain Drilling folder structure and provides a step-by-step procedure on how to use FTP and Putty. Opening a CMD shell within Phindows and how to take configuration backup remotely are also covered in this course.

TERSRV210: Terrain for Drilling 6.x Image Backup (I)

This course discusses the importance of image and config backup. This is followed by a step-by-step procedure on how to create and restore an image, and how to create and restore a config backup.

TERSRV215: Terrain for Drilling 7.x Hardware Update (I)

This course covers a brief hardware history and comparison of hardware of different versions. This course also discusses different installation kits and their components. This is followed by illustration of v3.0 hardware and its components which are discussed in detail.

TERSRV220: Terrain for Drilling 7.x Software Installation (I)

This course covers how to properly install Terrain for Drilling 7.x software. This course contains a step-by-step procedure on how to flash and configure an ECM for a Drill Interface Module (DIM) application. This is followed by setting up USB Image Tool and image installation.

TERSRV235: Terrain for Drilling 7.x Calibration (I)

This course covers all the required tasks for 7.x calibration. This includes Application File, different buttons under Calibration menu, and other additional features.

TERSRV225: Terrain for Drilling 7.x Software Upgrade (I)

This course discusses the software differences between v6.7 and v7.x. An overview of software history and current software architecture is discussed, followed by the software comparison between v6.x and v7.x in terms of interface and functionality. Some advanced features are also discussed in detail in this course.

TERSRV230: Terrain for Drilling Setup & Configuration (I)

Participants will learn how to configure the drill interface module and devices. The course also covers GPS configuration, the initial drill setup and the validation of the drill configuration.

TERSRV240: Terrain for Drilling Strata (I)

This course discusses the different Strata Configuration settings and functionality and focuses on Strata Recognition option. A step-by-step procedure on how to configure Strata settings are covered in this course.

Mining Technology Courses Descriptions

COURSE KEY

F = Foundational

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TERRAIN

SERVICE

TERSRV221: Terrain Grading and Loading Machine Configuration Utility (I)

Participants will learn how to set up machines in the MCU, configure advanced onboard features and use the MCU Help. It also covers how to resolve errors in configuration in the MCU, configure machines to display material and configure swath points.

TERSRV222: Terrain Grading and Loading Measure Up and Commissioning (I)

Participants will be able to explain where to find information regarding which machine measurements are required and list some considerations that must be taken when performing machine measurements. They will be able to identify the steps required to perform a machine measure up and identify the GPS x, GPS y, & GPS z measurements. They will be able to explain how to enter machine measurements, why there are different measure requirements for different machine types and how to perform a machine GPS validation.

TERSRV223: Terrain Loading Dual Antenna Excavator and Front Shovel Calibration (I)

This course covers the programming and calibration for dual antenna loading machines.

TERSRV232: Terrain Sites with Command for Hauling ILT (I)

This course covers the programming and calibration for dual antenna loading machines.

GENSRV101: Resources and Documentation (F)

This course provides an overview of how to locate documentation, software, and other service resources associated with Fleet, Terrain and Command

GENSRV102: General Harnessing Best Practices (F)

This course provides best practices for handling and routing harnesses as well as overviews and troubleshooting for various harness and cable types.

GENSRV201: GNSS Fundamentals (I)

This course explains the operation of the Global Navigation and Satellite System (GNSS) and how Cat ® MineStar™ utilizes this system.

GENSRV202: MineStar Network Communication Fundamentals (I)

This course explains the fundamentals needed to understand networking terminology, operation, and troubleshooting as it relates to the various MineStar systems.

GENSRV203: Service & Support (I)

This course covers the service and support processes that are in place to identify issues, capture the correct data, and submit issues to Caterpillar support teams.

TERRAIN



COMMAND FOR DOZING

Working with other Cat MineStar capability sets, Command brings together the technologies needed for fully integrated operations of autonomous, semi-autonomous and remotely controlled mining systems. Command is proven to work seamlessly with and around all mine site activities, equipment and personnel, helping you work safely and productively in a wider range of challenging environments.

DOZ_COMOCOP100: Operator Console for Operators (F)

This course covers key concepts to operate a track-type tractor through remote control, using the Operator Console.

DOZ_COMOSOP100: Operator Station for Operators (F)

This course covers key concepts to operate track-type tractor through remote control, using the Operator Station and effectively troubleshooting common communication and operational errors.

DOZ_COMSATS401: SATS for Operators (F)

This course is designed as a follow-up to training on using the Operator Station to operate a track-type tractor through remote control; it details topics including comparison between Operator Station RC vs. SATS, working with the Vision System, Terrain with Blade Control and SATS Automated Features and shift procedures.

DOZ_COMSRV102: Hardware Component Overview for CFD (F)

This course explains the critical concepts that you must understand to identify components to be installed on the Machine and Operator Console that enable remote-control operations for CFD.

DOZ_COMSRV103: CFD: Installing Hardware for Remote-Control (I)

This course explains the critical concepts that you must understand to install remote-control components on D10T and D11T tractors.

DOZ_COMSRV106: Install Vision System (I)

This course covers key concepts to describe when to use a Vision System for remote-control operation, list components of the Vision System, install Vision System hardware on a machine and install the operating system and software used for the Vision System.

DOZ_COMSRV107: Installing Software on the Machine (I)

This course covers key concepts to install software on machines for remote-control operation.

DOZ_COMSRV108: Install Software on and Calibrate the Operator Station (I)

This course covers key concepts to flash software for routers on the network, configure the network and install and calibrate software on the Operator Station.

DOZ_COMSRV109: Calibrating, Operating, and Commissioning the Operator Console (I)

This course covers key concepts to calibrate, startup/shut down, interpret the meaning of indicator lights, commission, list situations that cause unexpected shutdowns and use override procedures to handle unexpected shutdowns for machine operation with an Operator Console.

DOZ_COMSRV200: Basic Operator Station Functions (I)

This course explains how to navigate through touchscreen displays, startup/shut down the operator station and the selected machine, restart remote-control operation after an unplanned stop and interpret diagnostic messages, system status messages and indicator lights.

DOZ_COMSRV300: Commissioning and Troubleshooting CFD Systems (E)

This course explains how to follow commissioning steps in the Special Instructions for each Command for Dozing product, troubleshoot CFD systems based on system messages and determine which errors are caused by the customer's network.



COMMAND FOR HAULING

Working with other Cat MineStar capability sets, Command brings together the technologies needed for fully integrated operation of autonomous, semi-autonomous and remotely controlled mining systems. Command is proven to work seamlessly with and around all mine site activities, equipment and personnel, helping you work safely and productively in a wider range of challenging environments.

AHS_COMOF100: Command for Hauling Overview (F)

This course provides an overview of the CAT Command for Hauling, Autonomous Haulage System, system components, layers of protection and functionality.

AHS_COMOF110: Introduction to Surface Management (F)

This course addresses the essential information for participants to understand how Command Office utilizes surface information. Processes for surface creation and maintenance are detailed, as well as some expected behaviors of autonomous trucks in relation to surface information. This course also addresses the functionality and tools available on the Surface Editor page within the Command Office system.

AHS_COMOF120: Introduction to Lanes and Zones (F)

This course addresses the essential information for participants to understand and execute the process for creating Lanes and Zones. Additionally, participants will understand how lanes are used by autonomous trucks to travel throughout the mine site, predict the behavior of manned equipment and how zones are used throughout the mine site.

AHS_COMOF130: Introduction to Load Planning (F)

This course further addresses the information and processes needed to safely and correctly create and use zones within Command Office. Participants will be given the opportunity to enhance their zone creation skills by producing some commonly used zone types. Additionally, some common zone issues and troubleshooting will be covered.

AHS_COMOF140: Introduction to Dump Planning (F)

The Creating a New Dump Plan section of the Dump Planning course addresses the core knowledge that is needed to understand the function and meaning of the elements of a dump plan. Additionally, it addresses the processes and Command Office functionality required to create a new dump plan according to the Safe Work Procedures. The Updating a Dump Plan section of the Dump Planning course addresses the knowledge and functionality required to safely and properly update a dump plan in accordance with the Safe Work Procedures. The Crusher Dump Planning section of the Dump Planning course addresses the core knowledge that is needed to understand the function and meaning of the elements of a crusher dump plan.

AHS_COMOF150: Introduction to Stations (F)

This course addresses the Command Office functionality that is required to correctly create a functioning station plan that can be used for a variety of purposes. Additionally, the expected behavior of autonomous trucks at station plans is discussed, providing the information required to understand how the different elements of a station plan influence truck behavior.

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AHS_COMOF160: Introduction to Mine Model Management (F)

This course addresses the specific Command Office functionality required to validate the mine model using the Model Data Validation tool, along with other validation tools available. It includes instructions on how to use these tools, as well as some examples of issues that are specific to autonomous operations.

AHS_COMOF170: Introduction to the Autonomy Status Page (F)

This course outlines all components of the Autonomy Status and Autonomy Status Details pages. It includes all the information displayed on the both pages and outlines the function of all tools on both pages.

AHS_COMOF180: Introduction to Site Monitor (F)

The Site Monitor page is a simple way to observe all operations on the mine site. This course outlines the meaning of the different components of Site Monitor, include how to use all the tools available from the page.

AHS_COMOF190: Introduction to the Traffic Management Page (F)

This course provides role-based practice in key tasks and scenarios to confirm learning from ELT, address any knowledge gaps. This course will establish a base level of SKA, leading to an assessment to verify competence in a simulation environment.

AHS_COMOF199: Command for Hauling Foundational - VOC (F)

This course provides role-based practice in key tasks and scenarios to confirm learning from ELT, address any knowledge gaps. This course will establish a base level of SKA, leading to an assessment to verify competence in a simulation environment.

AHS_COMOF200: Managing Autonomous Traffic (I)

A module to Practice Scenarios/Troubleshooting within Roles. This course provides role-based practice in key tasks and scenarios leading to an assessment to verify competence in a simulation environment.

AHS_COMOF205: Surface Management (I)

This course further addresses the essential information for participants to understand how Command Office utilizes surface information in more detail. There will be an opportunity for participants to demonstrate their understanding of surface creation and maintenance processes, including coordination between roles. Information on troubleshooting surface issues will also be covered.

AHS_COMOF210: Surface Editor (I)

This course addresses the functionalities and tools available on the Surface Editor page within the Command Office system.

AHS_COMOF215: Lanes (I)

This course further addresses the essential information for participants to understand and execute the process for creating lanes. Additionally, more detail will be provided on how AMTs use lanes to adjust their behaviors. Participants will also be given an opportunity to further enhance their lane creation skills to ensure they can set up the lane network in a manner that allows efficient travel according to a traffic management plan. Troubleshooting common lane issues will also be included in this course.

AHS_COMOF220: Zones (I)

This course further addresses the information and processes needed to safely and correctly create and use zones within Command Office. Participants will be given the opportunity to enhance their zone creation skills by producing some commonly used zone types. Additionally, some common zone issues and troubleshooting will be covered.

COMMAND
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OFFICE

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AHS_COMOF230: Load Planning (I)

This course further addresses the load planning creation process. Participants will be given the opportunity to enhance their load planning skills, including optimization and coordination amongst roles. Common load planning troubleshooting will also be covered.

AHS_COMOF240: Dump Planning (I)

This course further addresses the information and processes needed to create different types of dump plans. Participants will be able to enhance their dump planning skills with a focus on efficiency and coordination between roles. Some common troubleshooting procedures will also be addressed. This course also covers the specific requirements for creating a crusher dump plan. This plan type can take more advanced skills and attention to detail, so participants will be able to gain experience in this process.

AHS_COMOF250: Stations (I)

This course further addresses the Command Office functionality that is required to correctly create a functioning station plan that can be used for a variety of purposes. Participants will be able to enhance their station creation skills, including some more advanced techniques that may be needed on their site. Some common troubleshooting procedures will also be addressed.

AHS_COMOF255: Refueling AMT (I)

This course provides further information and skills required to complete a refueling process within the AOZ. It will allow participants to enhance their skills at executing a typical refueling process with a focus on safety and coordination between roles.

AHS_COMOF260: Mine Model Management (I)

This course further addresses the specific Command Office functionality required to validate the mine model using the Model Data Validation tool, along with other validation tools available. Participants will be able to enhance their skills at identifying mine model issues and correcting them with as little impact to production as possible.

AHS_COMOF270: Inside the Office Area (I)

This course outlines the processes involved in changing operators on a loading tool and overtaking. When these activities occur within the Autonomous Operations Zone, there are additional steps and considerations that must be involved to safely complete these tasks. While there are not a great many Command Office steps involved, these tasks are done frequently and must be understood by all roles.

AHS_COMOF280: Autonomy Status Page (I)

This course allows participants to enhance their skills at using the Autonomy Status page to manage a fleet of AMTs throughout the course of a typical shift. There will be an emphasis on safety, troubleshooting, recovery and coordination between roles.

AHS_COMOF285: Using Site Monitor (I)

This course allows participants to enhance their skills at using the Site Monitor page to manage a fleet of AMTs throughout the course of a typical shift. There will be an emphasis on safety, troubleshooting, recovery and coordination between roles.

AHS_COMOF290: Traffic Management Page (I)

This course allows participants to gain practical experience with using the Traffic Management page in some typical activities/processes that are executed during a shift.

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AHS_COMOF295: Shift Change (I)

This course provides an example of what information should be included in the shift change handover, along with the roles responsible for gathering this information. It is important to pass along important information about the current state of operations to the crew coming in to work. A comprehensive handover helps with a seamless transition between shifts and allows production to continue without unnecessary interruptions.

AHS_COMOF299: Command for Hauling Intermediate - VOC (I)

This course provides role-based practice in key tasks and scenarios to confirm learning from ELT and address any knowledge gaps. This course will establish a base level of SKA, leading to an assessment to verify competence in a simulation environment.

ONBOARD

AHS_COMON100: Introduction to Command for Hauling - Autonomous Operations (F)

This course provides an overview of the CAT Command for Hauling, Autonomous Haulage System, system components, layers of protection and functionality. This course addresses specific concepts and procedures that are required to safely enter, operate within and exit out of the Autonomous Operations Zone (AOZ). This course should be taken by all individuals who will operate in the AOZ, whether they are working directly with autonomous trucks in the office or operating vehicles/machinery in the AOZ.

AHS_COMON110: Introduction to A-Stop Operations (Inside the AOZ - Entering the AOZ) (F)

This course provides the information and skills required to properly obtain, assign, utilize and return an A-Stop device while working in the AOZ. It should be taken by all individuals who are required to work within the autonomous area.

AHS_COMON120: Introduction to Operate a Vehicle in the AOZ (Inside the AOZ - Entering the AOZ) (F)

This course provides the information and skills required to operate a vehicle or machine in the AOZ, including entry in to the AOZ and rules for operating around AMT. This course should be taken by any individual who are required to operate a vehicle in the autonomous area.

AHS_COMON125: Introduction to Aux Panel Operations (Inside the AOZ – Entering the AOZ) (F)

This course provides the information and skills required to operate a light vehicle in the AOZ, including the functionalities of the Aux Panel. This course should be taken by any individual who are required to operate a vehicle in the autonomous area.

AHS_COMON130: Introduction to Terrain Grading in the AOZ (Inside the AOZ – Terrain G&L) (F)

This course provides the information and skills required to use Terrain for Grading with the AOZ. It includes specific functionality and procedures that allows Dozer/Auxiliary Loader operators to properly interact and load AMTs.

AHS_COMON140: Introduction to Terrain Loading in the AOZ (Inside the AOZ – Terrain G&L) (F)

This course provides the information and skills required to use Terrain for Loading within the AOZ. It includes specific functionality and procedures that allows loading tool operators to properly interact and load AMTs.

AHS_COMON150: Introduction to Operations Inside the AOZ (Command Office Team) (F)

This module introduces onboard operations, the interaction between manned operators in the AOZ and command staff to ensure applicable processes and procedures are understood and can be safely and efficiently applied.

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COMMAND FOR HAULING

ONBOARD

AHS_COMON160: Introduction to Mode Changing AMT (F)

This course introduces the knowledge and skills required to complete a mode changing procedures within the AOZ. It should be taken by any individuals who will be involved with mode changing and refueling activities for AMTs. The course will also cover AMT behavior at Stations and the processes and procedures to call and send AMTs.

AHS_COMON199: Introduction to Command for Hauling Onboard – VOC (F)

This course provides confirmation (VOC) of specific concepts and procedures that are required to safely enter, operate within the exit out of the Autonomous Operations Zone (AOZ). This course should be taken by all individuals who will operate in the AOZ, whether they are working directly with autonomous trucks in the office, or operating vehicles/machinery in the AOZ.

AHS_COMON200: Inside the AOZ (Command Office Team) (I)

This module confirms the knowledge and skills provided in AHS_COMON150 can be transferred to the operational environment. It confirms Command Staff understanding of AOZ on-board operations, the requirements for safe and efficient interactions between manned operators in the AOZ and command staff in the office, through the application of AOZ processes and procedures.

AHS_COMON210: Mode Changing and Refueling AMT (I)

This module confirms the knowledge and skills covered in AHS_COMON160 can be safely applied in an operational AOZ. It specifically covers the interaction required between manned operators in the AOZ and command staff to ensure site specific processes and procedures are understood and can be safely and efficiently applied.

AHS_COMSRV100: Intro to the Cat Autonomous Haul System (F)

This course contains an overview of the Cat Autonomous Haul System, system components and functionality.

AHS_COMSRV110: AHS-Base Machine Considerations (F)

This course highlights additional components fitted to a standard Cat 793F that enabled it to be an Autonomous Haul Truck (CMD).

AHS_COMSRV120: VIMS / Autonomy (F)

This course Contains an overview of the role of VIMS in the Autonomous Haul System.

AHS_COMSRV130: GNSS Fundamentals (F)

This course explains the operation of High Precision GNSS and how Cat® MineStar™ System utilized this system.

AHS_COMSRV140: Networking Fundamentals (F)

This course is an introduction to networking components, communication protocols and deployment on Cat machinery.

AHS_COMSRV150: 793F Command Assembly (F)

This course includes training and observation of trainees performing assembly tasks for the Command for Hauling Autonomy Layer components.

AHS_COMSRV160: 793F Command Maintenance and Service (F)

This course includes training and observation of trainees performing maintenance and service task for Command system.

AHS_COMSRV170: Introduction to MineStar Client (Autonomy) (F)

This course is an introduction to the MineStar Client and focuses on pages that should be used by technicians to remotely diagnose and troubleshoot faults.

SERVICE

COMMAND FOR HAULING

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SERVICE

AHS_COMSRV180: Field Troubleshooting and Repair (F)

This course is an overview of how to diagnose autonomy layer faults through various methods. It also covers harnessing best practices, common issues a technician may encounter in the field and how to resolve those issues.

AHS_COMSRV199: Onsite Exposure / Competency Journal (F)

This practical checklist allows the technician to perform each task that has been covered in the preceding training. Critical items covered are; locating autonomy documentation, performing maintenance on the autonomy layer, performing base machine calibrations, connecting to the truck remotely and demonstrating basic troubleshooting skills. Tasks can be signed off by authorised SME or site representative.

AHS_COMSRV200: Command for Hauling – Check Driving in AMT Locations (I)

This course covers the pertinent/critical knowledge required to safely/effectively perform a check drive for an autonomous mining truck.

AHS_COMSRV210: Using the AMT (I)

This course covers pertinent information/critical knowledge required to safely call and send an AMT from a station point, how to mode change from autonomous to manual and vice versa, as well as how to perform a pre-start check focusing specifically on the autonomy layer. Also covered is how to safely recover an autonomous truck from within the AOZ.

AHS_COMSRV220: Setup, Configuration, Calibration of an Autonomous Mining Truck (I)

This course covers task to Setup, Configure and Calibrate an Autonomous Mining Truck.

AHS_COMSRV230: Setup, Configuration, Calibration OJT (F)

This course is the practical session to perform setup, configuration and perform calibrations on an Autonomous Mining Truck.



COMMAND FOR HAULING



COMMAND FOR UNDERGROUND

Developed out of the need to reduce human exposure to injury, the system removes the operator from dangerous situations and allows them to work in a more comfortable, ergonomic environment. The system uses technology to automate and enhance operations, by enabling semi-autonomous control of Cat LHD's. Command for underground will increase productivity and make a measurable impact on your mine's bottom line.

UG_COMMAS200: Command for Underground Machine Automation System Components and Operation (I)

This course covers the use of hardware components, the power supply system, and machine control subsystems. Every hardware component of the machine is labeled and located in the contents of the course. Details about modules, parts, valves and switches are part of the explanations on how the machine operates. Explanations on the signals and transmissions are found in the course, along with the automated features of every component. Many improved components of the machine are specified in this course.

UG_COMMAS200: Command for Underground Machine Automation System Components and Operation – Lite (I)

This course covers the use of hardware components, the power supply system, and machine control subsystems for MXZ-Lite. Wiring and switches are shown while descriptions on how they function are included in the module. The basic parts of the hardware and their functionalities are included in the course.

UG_COMMAS300: Command for Underground Machine Automation Remote Control Systems (E)

The course elaborates the preparations and parts included in the Remote Operator Station (ROS) including the machine remote control operation. This course contains the limited version of the system and explains the similar dialog displays that can be seen in the ROS. Differences in the dialog displays are laid out and described. The purpose of each mode in the remote machine operations are defined and labeled in the course.

UG_COMMAS300: Command for Underground Machine Automation Remote Control Systems – Lite (E)

The course elaborates the preparations and parts included in the Remote Operator Station (ROS) including the machine remote control operation, specific to MXZ-Lite. This course contains the limited version of the system and explains the similar dialog displays that can be seen in the ROS. Differences in the dialog displays are laid out and described. The purpose of each mode in the remote machine operations are defined and labeled in the course.

Mining Technology Courses Descriptions

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COMMAND FOR UNDERGROUND

SERVICE

UG_COMAA100: Infrastructure (F)

This course covers the Local Area Radio Network (LARN), Autonomous Isolation System (AIS) and Autonomous Operator Station (AOS) for the MXY Command for Underground system. Included as an overview of the components use within the infrastructure system, description of the infrastructure subsystems, systems operation of the infrastructure system, configuration, diagnostics and maintenance of the infrastructure system.

UG_COMAA-MXZL100: Command for Underground Automation Area Overview (F)

This course provides an overview of the components and general operation of the automation area for Command for Underground. Aside from discussing the remote operation of LHD's location, this course also ensures that operators are aware of the potential hazards of the underground environment. This course also discusses advanced mining technology that provides an ergonomic operator station and semi-autonomous control reducing the machine damage.

UG_COMAA-MXZL200: Command for Underground Local Area Radio Network Overview (I)

This course provides an overview and high-level components of the Local Area Radio Network and how they work with Command for Underground, including communications with and other interrelated subsystems of Command for Underground. Ethernet and power connection diagrams are labeled and elaborated on in the course for identifying the connections and components of the system.

UG_COMAA-MXZL210: Command for Underground LARN Components and Operation (I)

This course includes the descriptions and components that make up LARN, including the power supply system and the communication network LARN uses, such as cabling, ports, switches and radios. Many of the associated activities and indicators are listed down with their functionalities to identify their connections to the power and network functionalities. This course also describes how the components work and how they communicate with interrelated subsystems of Command for Underground.

UG_COMAA-MXZL300: Command for Underground Area Isolation System Overview (E)

This course provides an overview of the Area Isolation System and how AIS provides an isolated area for autonomous machine operation. This course also has an overview of the hardware and software components that control and monitor operational areas. This course covers important safety procedures to follow in emergency situations.

UG_COMAA-MXZL310: Command for Underground Area Isolation System (E)

This course provides a deeper look on the Area Isolation System and its components.

UG_COMROS200: Command for Underground Operator Station – Hardware (I)

This course provides familiarization with the Command for Underground Operator Station Hardware including the components, communication networks and power network. The course shows the necessary information for the operator station hardware. Specific switches and buttons are shown as a guide in locating them in the Operator Station Hardware. Wiring between the site server and the components of ROS are visualized and described along with other important information about the network.

UG_COMROS300: Command for Underground Operator Station – Software (E)

The course covers the software components used by the Remote Operator Station (ROS). In the course are topics covering operator station software, software functionality such as MAS firmware and software, web diagnostics, map files, operations map files, and various system backups including full backups. The course describes the offboard and onboard software components. The basic ROS operations and configurations are also explained in the course.

COMMAND FOR UNDERGROUND

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UG_COMSYS300: Command for Underground Operations Training (E)

This course covers the Machine Automation System from an operational perspective. This course includes the practical use of all components of the machine automation system used in an operational capacity. Machine indicators, controls, dialog displays of the AIS console are all shown and labelled in course, and their purpose identified. Many of the installed software like SIEMENS WinCC are included in the course.

UG_COMSYS330: Command for Underground Maintenance Training (E)

This course covers the various types of machine maintenance required in the categories of as required - daily and monthly. The course identifies the completion of the hardware and software maintenance that supports the Command for Underground System. Detailed cleaning procedures are noted in the course for specific items like AIS LADAR, wiring and mounts. Events like system interruptions, circuit malfunctions and intermittent problems that hinder the machine are also discussed.

COMMAND FOR UNDERGROUND





FLEET FOR UNDERGROUND

Fleet enhances the management of all types of equipment operations, across one mine site or multiple sites. It also allows you to easily drill down for more detailed views and analysis, from reporting on selectable groups of assets down to individual machines.

OFFICE

UG_FLTOF100: Fleet Office Overview (F)

This course covers basic Fleet Office Concepts: what is Fleet, what advantages does it provide, how will it impact site operations, how will it impact site roles and responsibilities.

UG_FLTOF200: Fleet Office Operations: Client Pages / Consoles / Desktops (F)

This course covers navigating client pages, understanding user preferences and access, and saving pages, consoles and desktops.

UG_FLTOF300: Fleet Office Operations: Completing Pre-Shift / Start or Shift Tasks (F)

This course covers the completion of all basic tasks required during pre-shift and start of shift.

UG_FLTOF310: Fleet Office Operation: Model Validation (F)

This course covers the model validation tasks that must be performed during pre-shift / start of shift.

UG_FLTOF320: Fleet Office Operations: Checking Machine Availability (F)

This course covers the machine availability checks that must be performed during pre-shift / start of shift.

UG_FLTOF330: Fleet Office Operations: Haulage Level Assignments (F)

This course covers the haulage level assignment tasks that must be performed during pre-shift / start of shift.

UG_FLT335: Fleet Office Operations: Extraction Level Assignments (F)

This course covers the extraction level assignment tasks that must be performed during pre-shift / start of shift.

UG_FLTOF340: Fleet Office Operations: Updating Onboard Files (F)

This course covers the procedures use to update onboard files during pre-shift / start of shift.

UG_FLTOF400: Fleet Office Operations: Completing Tasks During Shift (F)

This course covers the completion of all basic tasks required during shift.

UG_FLTOF411: Fleet Office Operations: Troubleshooting Assignment Issues – Haulage Level (I)

This course covers troubleshooting assignment issues on the Haulage Level during a shift. Content covered includes probable causes and potential solutions for these issues.

UG_FLTOF412: Fleet Office Operations: Troubleshooting Assignment Issues – Extraction Level (I)

This course covers troubleshooting assignment issues on the Extraction Level during a shift. Content covered includes probable causes and potential solutions for these issues.

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UG_FLTOF413: Fleet Office Operations: Managing Assignments - Haulage Level (I)

This course covers managing assignments on the haulage level.

UG_FLTOF414: Fleet Office Operations: Managing Assignments – Extraction Level (I)

This course covers managing assignments on the extraction level.

UG_FLTOF420: Fleet Office Operations: Managing Fuel (I)

This course covers managing fuel consumption during a shift.

UG_FLTOF440: Fleet Office Operations: Managing Machine Health (I)

This course covers managing machine health during a shift.

UG_FLTOF450: Fleet Office Operations: Managing Messages (I)

This course covers managing messages during a shift.

UG_FLTOF460: Fleet Office Operations: Managing Site Design Items (I)

This course covers managing design items during a shift, including: identifying model problems, uploading files and creating drill patterns.

UG_FLTOF470: Fleet Office Operations: Creating / Reviewing Reports (I)

This course covers the creation and analysis of reports used during shifts.

UG_FLTOF480: Fleet Office Operations: Managing Machines (I)

This course covers adjusting machines, fleets and processors during a shift.

UG_FLTOF481: Fleet Office Operations: Managing Material Control (I)

This course covers creating and updating grades, materials, import blocks and bends during a shift.

UG_FLTOF482: Fleet Office Operations: Managing Users and Operations (I)

This course covers all tasks required to manage users and operators during a shift.

UG_FLTOF490: Fleet Office Operations: Travel Network Model (Haulage) (I)

This course covers tasks used to create waypoints, roads and destinations during a shift.

UG_FLTOF491: Fleet Office Operations: Travel Network Model (Extraction) (I)

This course covers tasks used to create waypoints, roads and destinations during a shift.

UG_FLTOF500: Fleet Office Operations: System Administration (I)

This covers all elements of system administration, including: network latency, coverage, heat maps and duplicates.

UG_FLTOF510: Fleet Office Operations: Machine Troubleshooting (I)

This covers machine troubleshooting, including: managing onboard files, pinging a machine and machine restarts.

UG_FLTOF520: Fleet Office Operations: Managing Support Items (I)

This course covers managing support items, including: the support process, logging support items and scheduling patches.

UG_FLTOF530: Fleet Office Operations: System Troubleshooting (I)

This course covers system troubleshooting, including: disk space, data retention and reviewing service logs.

FLEET FOR
UNDERGROUND

Mining Technology Courses Descriptions

COURSE KEY

F = Foundational

I = Intermediate

E = Expert



= eLearning Available

FLEET FOR UNDERGROUND

OFFICE

UG_FLTOF540: Fleet Office Operations: Scheduled Jobs (I)

This course covers scheduled jobs, including: downloading VIMS, mining block imports and exports, and health deletion jobs.

UG_FLTOF550: Fleet Office Operations: System Reporting (I)

This course covers system reporting, including: Creating automated reports, running standard reports, adjusting dashboard limits and adjusting reporting targets.

UG_FLTOF560: Fleet Office Operations: Scheduling Tasks (I)

This course covers scheduling tasks, including: ensuring that DB and file deletion is occurring, creating and sending snapshots, and ensuring that data exports are occurring.

UG_FLTOF600: Fleet Office Operations: End of Shift (I)

This course covers all tasks required to end a shift including: starting a shift change, reviewing delays, logging out and controller hand-over.

UG_FLTON100: Fleet Onboard Overview (F)

This course covers basic Fleet Onboard concepts: what is Fleet, what advantages does it provide, how will it impact site operations, how will it impact site roles and responsibilities?

UG_FLTON200: Fleet User Interface (I)

This course covers the basic elements of the Fleet User Interface and explains the purpose for those elements. Includes adjusting brightness and day / night mode and state changes.

UG_FLTON 210: Fleet User Interface for Haul Truck Operators(I)

This course covers the specific elements of the Fleet Haul Truck Interface and explains how the interface is used to interact with Fleet Onboard functionality.

UG_FLTON 220: Fleet User Interface for Load Haul Dumps (Manned) (I)

This course covers the specific elements of the Fleet Load Haul Dump (Manned) Interface and explains how the interface is used to interact with Fleet Onboard functionality.

UG_FLTON 221: Fleet User Interface for Load Haul Dumps (Remote) (I)

This course covers the specific elements of the Fleet Load Haul Dump (Remote) Interface and explains how the interface is used to interact with Fleet Onboard functionality.

UG_FLTON 300: Fleet Onboard Operations: Completing Start of Shift Tasks (I)

This course covers all the Fleet Onboard tasks that must be completed by Operators during pre-shift or at the start of a shift. Topics covered include primary startup tasks like logging in and startup checks like confirming GPS accuracy and radio connectivity.

UG_FLTON 400: Fleet Onboard Operations: Completing Start of Shifts – Basics (I)

This course covers basic tasks performed using Fleet Onboard during shift, including: identifying and understanding assignments and managing machine activities.

UG_FLTON 410: Fleet Onboard Operations: Completing Tasks During Shift - Advanced (I)

This course covers advanced tasks performed using Fleet Onboard during shift, including: identifying routes, managing state changes, confirming loading at correct loading tool, and managing activity codes.

ONBOARD

FLEET FOR UNDERGROUND

Mining Technology Courses Descriptions

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FLEET FOR UNDERGROUND

ONBOARD

UG_FLTON 500: Fleet Onboard Operations: Managing Material Information (I)

This course covers tasks performed using Fleet Onboard to manage material information, including: mill loader recipes, manual grade block identification, and manual material identification.

UG_FLTON 600: Fleet Onboard Operations: Performing End of Shift Activities (I)

This course covers all tasks performed in Fleet Onboard at the end of a shift, including starting a delay and logging out.

UG_FLTON 700: Fleet Onboard Operations: Safety and Maintenance (I)

This course covers all safety and maintenance related information pertaining to the use of the Fleet Onboard system.

GENERAL SERVICE

GENSERV101: Resources and Documentation (F)

This course provides an overview of how to locate documentation, software, and other service resources associated with Fleet, Terrain and Command

GENSERV102: General Harnessing Best Practices (F)

This course provides best practices for handling and routing harnesses as well as overviews and troubleshooting for various harness and cable types.

GENSERV201: GNSS Fundamentals (I)

This course explains the operation of the Global Navigation and Satellite System (GNSS) and how Cat ® MineStar™ utilizes this system.

GENSERV202: MineStar Network Communication Fundamentals (I)

This course explains the fundamentals needed to understand networking terminology, operation, and troubleshooting as it relates to the various MineStar systems.

GENSERV203: Service & Support (I)

This course covers the service and support processes that are in place to identify issues, capture the correct data, and submit issues to Caterpillar support teams.

For more information or to request a course, please go to:

www.cat.com/MineStarTraining