

# MINING TECHNOLOGY

TRAINING COURSE CATALOG



**CATERPILLAR®**

# MINING TECHNOLOGY



FLEET



TERRAIN



DETECT



HEALTH



COMMAND

## TRAINING COURSE CATALOG

### TRAINING OVERVIEW

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.

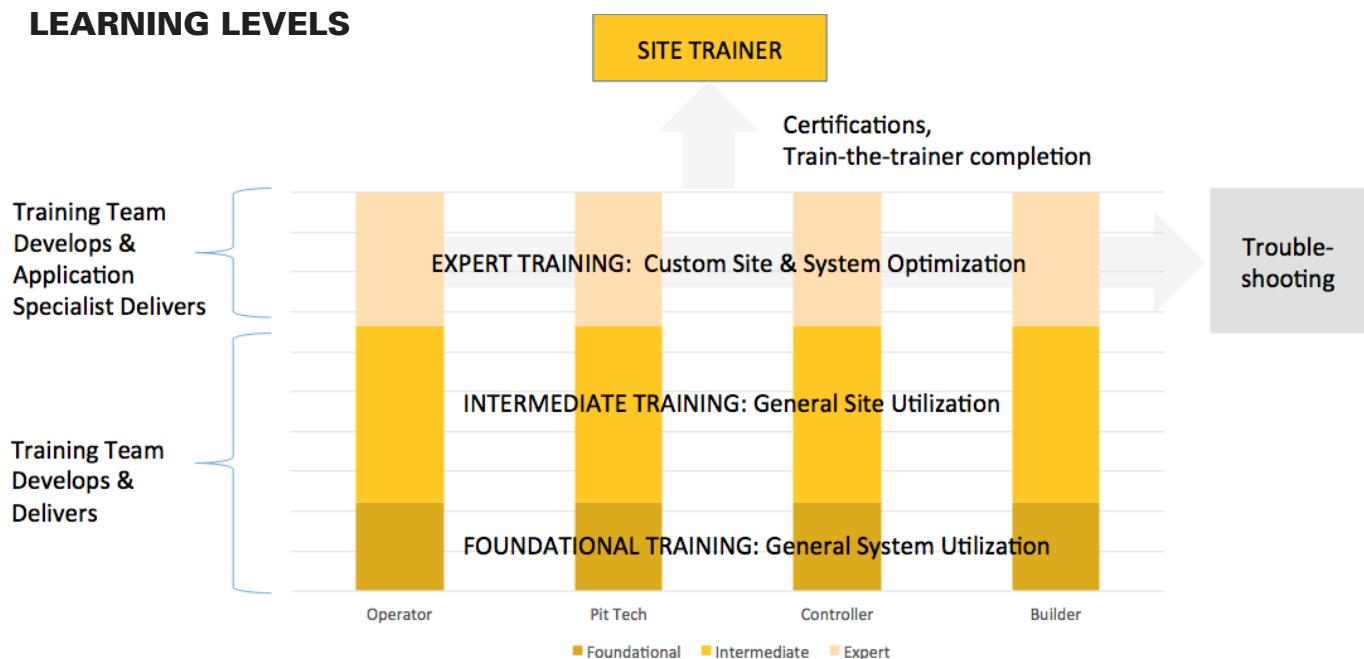
## SKILL LEVELS

**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 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



## CURRICULUM OVERVIEW

	OFFICE	ONBOARD / OPERATOR	SERVICE / INSTALLATION
FLEET	<ul style="list-style-type: none"> <li>• Fleet Overview</li> <li>• Fleet Controller</li> <li>• Fleet Controller SIM</li> <li>• Fleet Builder</li> </ul>	<ul style="list-style-type: none"> <li>• Fleet Builder SIM</li> <li>• Fleet Advanced</li> <li>• Fleet Advanced SIM</li> </ul>	<ul style="list-style-type: none"> <li>• Fleet Onboard</li> </ul>
TERRAIN	<ul style="list-style-type: none"> <li>• Terrain Overview</li> <li>• Terrain Office</li> </ul>	<ul style="list-style-type: none"> <li>• Terrain-Drilling</li> <li>• Terrain-G&amp;L</li> </ul>	<ul style="list-style-type: none"> <li>• Service-Drilling</li> <li>• Service-G&amp;L</li> </ul>
HEALTH	<ul style="list-style-type: none"> <li>• Health Office Basics</li> </ul>		
COMMAND:DOZING	<ul style="list-style-type: none"> <li>• Dozing Overview</li> </ul>	<ul style="list-style-type: none"> <li>• Dozing Station Operator</li> <li>• Dozing Console Operator</li> <li>• Dozing SATS Operator</li> </ul>	
COMMAND:HAULING	<ul style="list-style-type: none"> <li>• AHS Overview</li> <li>• AHS Controller SIM</li> <li>• AHS Builder SIM</li> </ul>	<ul style="list-style-type: none"> <li>• AHS Onboard</li> </ul>	<ul style="list-style-type: none"> <li>• AHS Service</li> </ul>
COMMAND:UNDERGROUND	<ul style="list-style-type: none"> <li>• Underground Overview</li> </ul>	<ul style="list-style-type: none"> <li>• Underground Operator</li> </ul>	<ul style="list-style-type: none"> <li>• Underground Service</li> </ul>
FLEET: UNDERGROUND	<ul style="list-style-type: none"> <li>• Fleet Underground Overview</li> <li>• Fleet Underground Operator</li> </ul>	<ul style="list-style-type: none"> <li>• Fleet Underground Onboard</li> </ul>	





## 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 (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.

OFFICE

FLTOF170



**Introduction to Health within Fleet Office (F)** – This course provides a basic overview of the Health related pages within Fleet Office such as Health Event Monitor, Maintenance Event Monitor, Alarm Monitor and Health levels and alarms.

FLTOF180



**Introduction to Messaging (F)** – This course covers how to send messages from within Fleet Office, as well as the Office Message Monitor page.

FLTOF190



**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)** – 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.

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.

FLTOF230

**Mining Block Management (I)** – 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.

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 pre-determined 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.

FLTOF310

**Systems Admin (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.

## ONBOARD

FLEET	
ONBOARD	
SERVICE	
FLTON100	<b>Fleet Onboard Systems Overview (F)</b> – 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	<b>Fleet Onboard System Fundamentals (I)</b> – This course describes in detail the Fleet Onboard System Features and Functionalities.
FLTON300	<b>Onboard User Operational Procedures (I)</b> – This course describes the Fleet Onboard Operator Utilities, Operational Techniques and Procedures. The Machine Operator will perform navigational tasks.
FLTON400	<b>Fleet Onboard System Maintenance (I)</b> – This course explains the Fleet Onboard Safety and Maintenance procedures.
FLTON500	<b>Troubleshooting the Fleet Onboard System (I)</b> – This course explains Fleet Onboard troubleshooting.
FLTSRV100 	<b>MineStar Fleet Onboard Introduction (F)</b> – 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 	<b>Operator Onboard Overview (F)</b> – 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 	<b>GNSS Fundamentals (F)</b> – 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.
FLTSRV130 	<b>Network Fundamentals (F)</b> – 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.
FLTSRV203	<b>Fleet Onboard Components (GEN III) (I)</b> – 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	<b>Fleet Onboard Components (GEN IV) (I)</b> – This course covers the components that make up the Gen IV Fleet Onboard system. Block diagrams, component descriptions and operation of each is explained.
FLTSRV213	<b>Fleet Onboard Installation Locations and Considerations (GEN III) (I)</b> – 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 MAC addresses.
FLTSRV214	<b>Fleet Onboard Installation Locations and Considerations (GEN IV) (I)</b> - 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 MAC addresses.
FLTSRV223	<b>Fleet Onboard Maintenance and Support (GEN III) (I)</b> – Participants will learn 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.
FLTSRV224	<b>Fleet Onboard Maintenance and Support (GEN IV) (I)</b> - 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.



FLTSRV233

**Fleet Onboard Commissioning (I)** – Participants will learn how to measure 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.

FLTSRV234

**Fleet Onboard Commissioning (GEN IV) (I)** – Participants will learn how to measure up a Fleet machine, validate it's reported position in MineStar compared to it's actual position, and confirm that all necessary information is entered into the system before it is used in the Active Mining Area.

FLTSRV243

**Fleet Onboard Troubleshooting (GEN III) (I)** – This course covers troubleshooting tools available for Fleet onboard, basic troubleshooting techniques and common issues.

FLTSRV244

**Fleet Onboard Troubleshooting (GEN IV) (I)** – This course covers troubleshooting tools available for Fleet onboard, basic troubleshooting techniques and common issues.

FLTSRV303

**Fleet Onboard Installation (GEN III) (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.

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.

FLTSRV313

**Fleet Onboard Setup and Configuration (GEN III) (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 site.

FLTSRV314

**Fleet 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 components is configured correctly for site.

FLTSRV323

**Fleet Onboard Upgrades (GEN III) (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.

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.

FLTSRV333

**Fleet Onboard Troubleshooting (GEN III) (E)** – This course covers more advanced troubleshooting techniques for Fleet onboard.

FLTSRV334

**Fleet Onboard Troubleshooting (GEN IV) (E)** – This course covers more advanced troubleshooting techniques for Fleet onboard.



## TERRAIN

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

TEROF100



**Terrain Office 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.

TEROF101



**Terrain Office Basics (F)** - This course explains the benefits and features of the incorporation of the GIS server into Terrain. Participants will learn how snippets, site models, bounding regions and groups are used in Terrain.

TEROF102



**Terrain Office User Interface (F)** - This course reviews the Terrain Office user interface, including 2D views and 3D visualization, displaying multiple files and file profiles and using GPS Replay. User access and the online Help are covered as well.

TEROF103



**Terrain Design Files (F)** - This course covers the types of G&L design files and the information they contain in Terrain Office. Participants will learn how to create elevation design files, material grade files, avoidance zone design files, display data design files, current elevation time design files and material design files. This course also covers viewing the converting design files and loading site models. Sending design files and updating layers to machines is also covered. Participants will also learn how to convert a .cat file and send to and remove from machines in Terrain Office.

TEROF104



**Terrain Drill Pattern Files (F)** - Participants will learn how to view and manage drill files in Terrain Office. This course also covers adjusting drill holes, adding and editing artifacts, and merging drill patterns.

TEROF105



**Planes, Layers, Models & Projects (F)** - This course covers creating flat and incline planes, creating update layers, loading site models and merging survey files and site models.

TEROF106



**Users, Groups & Templates (F)** - Participants will learn how to add, edit and remove users and groups. They will learn how to add a bounds region and manage DXF Transfer Templates.

TEROF107



**Onboard Groups & List Items (F)** - This course covers creating and updating Onboard List groups in Terrain Office. Participants will learn how to manage onboard list items and generate MWF, Machine List files and Machine Type List files.

TEROF108



**Working with Machines (F)** - Participants will learn how to use Machine Monitor to filter and view machine information, will locate machines in Site Monitor and will set up Machine Overview. The course also covers the use of Machine Assistant to view specific machine information. Participants will learn how to add and manage machine models and machines in Terrain Office including registering machines and using the Machine Configuration Utility.

TEROF109



**Managing Messages & Tasks (F)** - This course covers adding, editing, archiving, restoring and generating text messages. Participants will use the Task List Manager to create, send and review Task List messages. The course also covers daily, weekly and monthly checklist tasks for Terrain Office personnel.

TEROF110



**Reports & Exports (F)** - This course covers standard report and timeline reports in Cat Reports. Participants will learn how to run a Task List Manager report and run a data export report with specific parameters and verify that scheduled data exports are occurring in Terrain Office.

TEROF200



**Support Process (I)** - This course covers using the snapshot tool, batch files and the support process for Caterpillar. Participants will also learn about the tiers of support and how to submit a support case.

## TERRAIN

## OFFICE

TEROF201



TEROF202

**General Troubleshooting (I)** - This course covers monitoring and clearing alarms. Participants will learn how to display file conversion information, monitor field events, review information in the Field Communications Monitor, and request system information, diagnostics and productivity reports.

**Advanced Troubleshooting (I)** - This course covers configuring and verifying coordinate systems, verifying onboard systems, pinging and using trace route for troubleshooting onboard systems. Participants will learn how to use VNC and Windows to connect or remote into a specific machine and review the server disk space.

TERON100



TERON101



TERON102



TERON103



TERON104



TERON105



TERON106



TERON107



TERON108



TERON110



**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

## ONBOARD

# TERRAIN

## SERVICE

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.

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 Onboard Software Installation & Registration for G&L Machines (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.

TERSRV113

**Terrain for Drilling Setup & Configuration (F)** - 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.

TERSRV114

**Drill Calibration (F)** - This course covers calibration processes for drills and validating the GPS positioning.

## TERRAIN

## SERVICE

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.

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.

TERSRV202

**Terrain Office Site Settings & Configuration (I)** - Participants will learn the main steps for adding a coordinate system and verifying it. Participants will also learn how to set up a new site in Terrain Office and in the MCU.

TERSRV203

**Programming & Calibrating Sensors on a Dual Antenna Excavator (I)** - This course covers the programming and calibration for dual antenna loading machines.





## HEALTH

When you know what's going on inside your equipment, you're one step ahead in the cost-control battle. Cat Health helps you make that connection - with any brand of equipment. You can monitor critical machine parameters, analyze trends and get real-time alerts when issues arise, so you can take action to fix problems before they turn into major repairs.

OFFICE

HEAOF100



**Introduction to MineStar Health (F)** – This course provides an overview of the MineStar Health system, including some fundamental functionalities, key benefits of using the system, and basic methods for accessing and interacting with the system.

HEAOF110



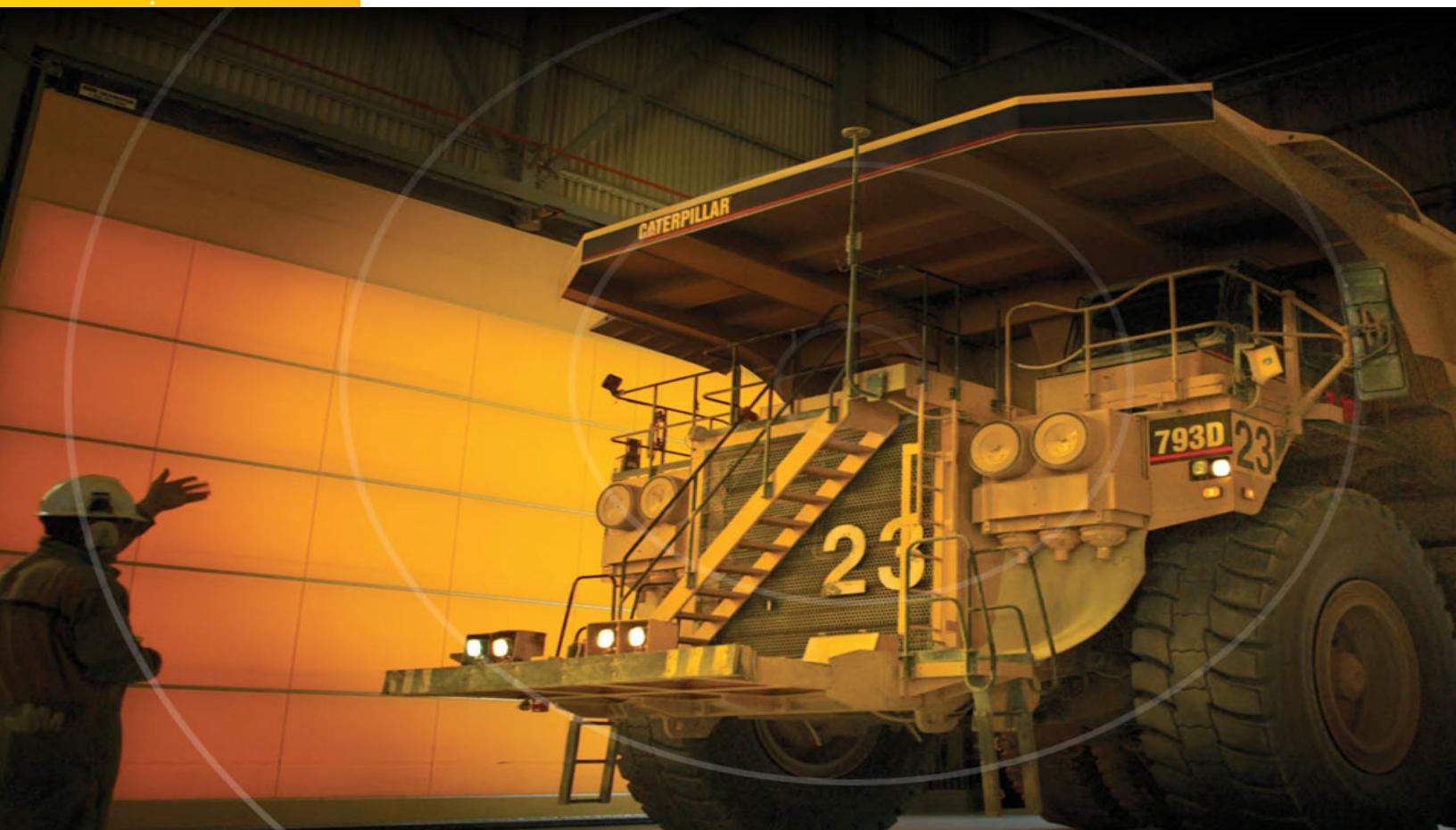
**MineStar Thin Client (F)** - This course provides examples of how the MineStar Thin Client can be used to monitor and manage data related to MineStar Health. Knowledge of the MineStar Thin Client is necessary for understanding this content.

HEAOF200

**VIMS and Health (I)** - This course describes the VIMS files, where they are generated, and what each file brings into MineStar Health. This course is used before discussing the MineStar desktop client.

HEAOF210

**Health within MineStar Health (I)** - This course is designed for entry to mid-level users of the MineStar Health desktop application. The course also covers how VIMS is used by MineStar Health Office and describes the pages where data coming from the machines in the field can be observed.





## COMMAND FOR DOZING

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.

ONBOARD

DOZ\_COMOCOP100

DOZ\_COMOSOP100

**CFD: Operator Console for Operators (F)** – This course covers key concepts to operate a track-type tractor through remote control, using the Operator Console.

**Operator Station for Operators (F)** – This course covers key concepts to operate a track-type tractor through remote control, using the Operator Station and effectively troubleshooting common communication and operational errors.





## 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 some common elements of the Command Office client. Additionally, some key information regarding the operation of autonomous trucks is discussed, along with some important concepts on how to interact around autonomous trucks.

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)** - The Creating a New Load Plan section of the Load Planning course addresses the information and functionality necessary to successfully and safely create a load plan. This information includes basic information about the elements of a load plan, as well as the settings available to help configure the plan for efficient use. The Updating a Load Plan section of the Load Planning course outlines the steps required to safely and efficiently update a load plan.

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.

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 of the information displayed on the both pages, and outlines the function of all tools on both pages.

# COMMAND FOR HAULING

## OFFICE

AHS\_COMOF180



AHS\_COMOF190

AHS\_COMOF199

AHS\_COMOF200

AHS\_COMOF205

AHS\_COMOF210

AHS\_COMOF215

AHS\_COMOF220

AHS\_COMOF230

AHS\_COMOF240

AHS\_COMOF250

**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 of the tools available from the page.

**Introduction to the Traffic Management Page (F)** - This course addresses the Command Office functionality required to use the Traffic Management Page and Speed Assistant, including the information displayed on both pages and how to use the different tools available.

**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.

**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.

**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.

**Surface Editor (I)** - This course addresses the functionality and tools available on the Surface Editor page within the Command Office system.

**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.

**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.

**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.

**"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 particular plan type can take more advanced skills and attention to detail, so participants will be able to gain experience in this process."

**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.

# COMMAND FOR HAULING

AHS\_COMOF255

**Refuelling 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 refuelling 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.

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.

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 into, 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.

## OFFICE

## ONBOARD

# COMMAND FOR HAULING

## COMMAND FOR HAULING

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 functionality of the Aux Panel. This course should be taken by any individual who are required to operate a vehicle in the autonomous.

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 within the AOZ. It includes specific functionality and procedures that allows Dozer/Auxiliary Loader operators to proper interact with AMT's.

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 proper interact and load AMT's.

AHS\_COMON150



**Introduction to Operations Inside the AOZ (Command Office Team) (F)** - This module provides an introduction to 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.

AHS\_COMON160



**Introduction to Mode Changing AMT (F)** - This course provides an introduction to 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 into, 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\_COMON200

**Inside the AOZ (Command Office Team) (I)** - This module confirms the knowledge and skill 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 enable 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 utilizes this system.

## ONBOARD

## SERVICE

## COMMAND FOR HAULING

# COMMAND FOR HAULING

## SERVICE

AHS\_COMSRV140



AHS\_COMSRV150

AHS\_COMSRV160

AHS\_COMSRV170

AHS\_COMSRV180

AHS\_COMSRV199

AHS\_COMSRV200

AHS\_COMSRV210

AHS\_COMSRV220

AHS\_COMSRV230

**Networking Fundamentals (F)** - This course is an introduction to networking components, communication protocols and deployment on Cat machinery.

**793F Command Assembly (F)** - This course includes training and observation of trainees performing assembly tasks for the Command for Hauling Autonomy Layer components.

**793F Command Maintenance and Service (F)** - This course includes training and observation of trainees performing maintenance and service tasks for Command system.

**Introduction to MineStar Client (Autonomy) (F)** - This course introduces key MineStar Autonomous Mining Features and Interaction.

**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.

**Onsite Exposure / Competency Journal (F)** - This course covers basic safety/hazard awareness/swp usage. This course also covers identifying Autonomy Layer components, performing maintenance and assembly tasks for Autonomy Layers, performing base machine calibrations and remote diagnostics and Client navigation.

**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.

**Using the AMT (I)** - This course covers the pertinent/critical knowledge required to safely/effectively perform service.

**Setup, Configuration, Calibration of an Autonomous Mining Truck (I)** - This course covers tasks to Setup, Configure and Calibrate an Autonomous Mining Truck.

**Setup, Configuration, Calibration OJT (F)** - This course includes training and observation of trainees with respect to their performance against established training objectives and recommendation of additional skill requirements as training needed.





## 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.

SERVICE

UG\_COMMAS100

**Machine Automation System (F)** – This course covers the Machine Automation System (MAS). Included is an overview of the components used within the MAS system: Systems operations of the MAS system, configuration, diagnostics and maintenance of the MAS system.

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 is 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.

OPERATOR

UG\_COMOP100

**Operator Training (F)** – This course covers an overview of the Command for Underground system. This course also covers an overview of the components of the Machine Automation System and Area Isolation System. An overview of the Autonomous Operator Station and the controls to safely operate a load haul dump remotely are also covered.





## 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	<b>Fleet Office Overview (F)</b> - 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	<b>Fleet Office Operations: Client Pages / Consoles / Desktops (F)</b> - This course covers navigating client pages, understanding user preferences and access, and saving pages, consoles and desktops.
UG_FLTOF300	<b>Fleet Office Operations: Completing Pre-Shift / Start of Shift Tasks (F)</b> - This course covers the completion of all basic tasks required during pre-shift and start of shift.
UG_FLTOF310	<b>Fleet Office Operations: Model Validation (F)</b> - This course covers the model validation tasks that must be performed during pre-shift / start of shift.
UG_FLTOF320	<b>Fleet Office Operations: Checking Machine Availability (F)</b> - This course covers the machine availability checks that must be performed during pre-shift / start of shift.
UG_FLTOF330	<b>Fleet Office Operations: Haulage Level Assignments (F)</b> - This course covers the haulage level assignment tasks that must be performed during pre-shift / start of shift.
UG_FLTOF335	<b>Fleet Office Operations: Extraction Level Assignments (F)</b> - This course covers the extraction level assignment tasks that must be performed during pre-shift / start of shift.
UG_FLTOF340	<b>Fleet Office Operations: Updating Onboard Files (F)</b> - This course covers the procedures used to update onboard files during pre-shift / start of shift.
UG_FLTOF400	<b>Fleet Office Operations: Completing Tasks During Shift (F)</b> - This course covers the completion of all basic tasks required during shift.
UG_FLTOF411	<b>Fleet Office Operations: Troubleshooting Assignment Issues - Haulage Level (I)</b> - 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	<b>Fleet Office Operations: Troubleshooting Assignment Issues - Extraction Level (I)</b> - This course covers troubleshooting assignment issues on the Extraction Level during a shift. Content covered includes probably causes and potential solutions for these issues.
UG_FLTOF413	<b>Fleet Office Operations: Managing Assignments - Haulage Level (I)</b> - This course covers managing assignments on the haulage level.
UG_FLTOF414	<b>Fleet Office Operations: Managing Assignments - Extraction Level (I)</b> - This course covers managing assignments on the extraction level.
UG_FLTOF420	<b>Fleet Office Operations: Managing Fuel (I)</b> - This course covers managing fuel consumption during a shift.
UG_FLTOF440	<b>Fleet Office Operations: Managing Machine Health (I)</b> - This course covers managing machine health during a shift.

## FLEET FOR UNDERGROUND

### OFFICE

UG_FLTOF450	<b>Fleet Office Operations: Managing Messages (I)</b> - This course covers managing messages during a shift.
UG_FLTOF460	<b>Fleet Office Operations: Managing Site Design Items (I)</b> - This course covers managing design items during a shift, including: identifying model problems, uploading files and creating drill patterns.
UG_FLTOF470	<b>Fleet Office Operations: Creating / Reviewing Reports (I)</b> - This course covers the creation and analysis of reports used during shift.
UG_FLTOF480	<b>Fleet Office Operations: Managing Machines (I)</b> - This course covers adjusting machines, fleets and processors during a shift.
UG_FLTOF481	<b>Fleet Office Operations: Managing Material Control (I)</b> - This course covers creating and updating grades, materials, import blocks and bends during a shift.
UG_FLTOF482	<b>Fleet Office Operations: Managing Users and Operators (I)</b> - This course covers all tasks required to manage users and operators during a shift.
UG_FLTOF490	<b>Fleet Office Operations: Travel Network Model (Haulage) (I)</b> - This course covers tasks used to create waypoints, roads and destinations during a shift.
UG_FLTOF491	<b>Fleet Office Operations: Travel Network Model (Extraction) (I)</b> - This course covers tasks used to create waypoints, roads and destinations during a shift.
UG_FLTOF500	<b>Fleet Office Operations: System Administration (I)</b> - This course covers all elements of system administration, including: network latency, coverage, heat maps and duplicates.
UG_FLTOF510	<b>Fleet Office Operations: Machine Troubleshooting (I)</b> - This course covers machine troubleshooting, including: managing onboard files, pinging a machine and machine restarts.
UG_FLTOF520	<b>Fleet Office Operations: Managing Support Items (I)</b> - This course covers managing support items, including: the support process, logging support items and scheduling patches.
UG_FLTOF530	<b>Fleet Office Operations: System Troubleshooting (I)</b> - This course covers system troubleshooting, including: disk space, data retention and reviewing service logs.
UG_FLTOF540	<b>Fleet Office Operations: Scheduled Jobs (I)</b> - This course covers scheduled jobs, including: downloading VIMS, mining block imports and exports, and health deletion jobs.
UG_FLTOF550	<b>Fleet Office Operations: System Reporting (I)</b> - This course covers system reporting, including: creating automated reports, running standard reports, adjusting dashboard limits and adjusting reporting targets.
UG_FLTOF560	<b>Fleet Office Operations: Scheduling Tasks (I)</b> - 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	<b>Fleet Office Operations: End of Shift (I)</b> - This course covers all tasks required to end a shift, including: starting a shift change, reviewing delays, logging out and controller hand-over.

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

[cat.com/MineStarTraining](http://cat.com/MineStarTraining)