MINING TECHNOLOGY

TRAINING COURSE CATALOG

CAT® MINESTAR™

FLEET | TERRAIN | DETECT | HEALTH | COMMAND

CATERPILLAR®

Contents

How to Use This Course Catalog
This Training Course Catalog can be used to review the MineStar Training Offerings that are available and found on page 7. Individual Course descriptions are found towards the end of this catalog. Individual courses make up each Training Offering. Once you decide on which Offering you would like to take, go to page 21 to contact the MineStar Training Team to schedule a training.

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. A MineStar Training Offering is made up of multiple individual courses which can be either eLearning or Instructor Led. The Offerings contain the high-level objectives, goals and a list of the individual courses. For more details on each individual course, you will need to go to the course number towards the middle-to-end of the catalog. 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 individual courses. The Offerings are organized by Product (Fleet, Terrain and Command).

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, or complete the form on https://www.cat.com/minestartraining.

How to Read a Course Description
The Training Course Catalog provides detail about each individual course, to allow the reader to better understand what will be covered during the training. Below is a typical example of the information you can find about each course, followed and what each part of the description represents.

> **FLTOF100: Overview and Basics (F)** 
> This course covers an overview of Fleet Office, its capability sets in the suite of MineStar products, and key terms. It also includes basic system navigation such as page configurations, consoles, 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 before attending the Instructor Led training. If this does not appear in front of a course, the course is an ILT (Instructor Led Training) course, which is taught in the classroom.
- **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), Advanced (200), or Expert (300) courses. 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.
- **Course title (Product Overview & Client Pages/Consoles/Desktops)** provides a good shorthand statement of what a course is about.

- **Skill level ((F))** indicates the skill level obtained with the course; Foundational (F), Advanced (A), or Expert (E). The course in the example is a Foundational course.

- **Course descriptions** usually two or three sentences, provides more detailed information about the course. In this example, you can see it focuses on how to log in and out and navigating through MineStar as well as some setup instruction.

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.

Product Introductory Course

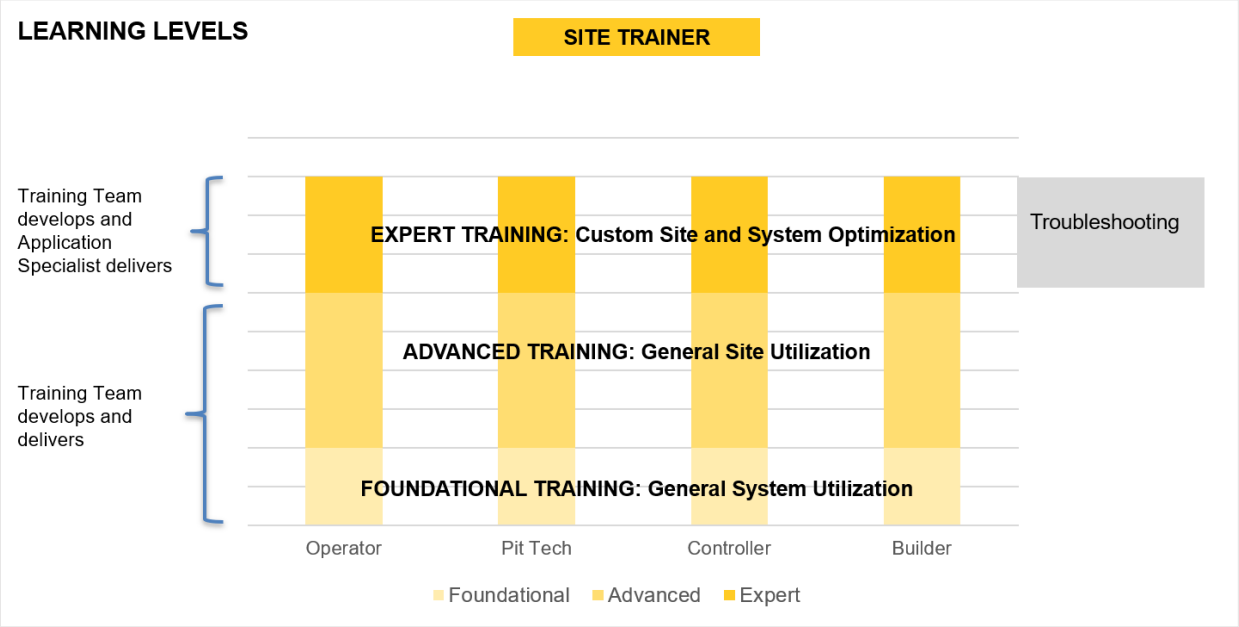
Called PRDOVR101: MineStar Product Introduction Course, this set of curated videos and presentations are designed to provide an overview of the MineStar solution and the benefits it provides to users and new customers alike. These courses are found in the Mining Technology Academy and are accessible via self-registration. Since this is an overview of the products, this course should be taken before going through the rest of the content listed in this course catalog.

Skill Levels

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

Advanced - 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 advanced training often want to know in-depth 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.



Training Offerings

Fleet

Fleet Office - Controller

Objective:

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

Fleet Office - Builder

Objective:

The Fleet Office – Builder Training will provide the knowledge and skills a candidate must demonstrate to be deemed competent to perform technical and admin tasks. This list contains a recommended training path for builders. This training 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: Overview and Basics (F) - eLearning
FLTOF110: Introduction to the Spatial Mine Model (F) - eLearning
FLTOF120: Introduction to Material Tracking (F) - eLearning
FLTOF130: Introduction to Assignment (F) - eLearning
FLTOF140: Introduction to Fueling and TKPH (F) - eLearning
FLTOF150: Introduction to Delays (F) - eLearning
FLTOF160: Introduction to Cycles (F) - eLearning
FLTOF170: Introduction to Messaging (F) - eLearning
FLTOF180: General Processes (F) - eLearning
FLTOF200: Spatial Mine Model Building (A) - eLearning
FLTOF205: Adding and Archiving Machines (A) - ILT
FLTOF210: Checking, Monitoring and Moving Machines (A) - ILT
FLTOF215: Fueling and TKPH (A) - ILT
FLTOF225: Material Tracking (A) - ILT
FLTOF235: Assignments (A) - ILT
FLTOF245: Delays (A) - ILT
FLTOF250: Cycles (A) - ILT
FLTOF255: Messaging (A) - ILT
FLTOF260: KPI Dashboards and Reporting (A) - ILT
FLTOF265: Field Comms and Onboard Files (A) - ILT
FLTOF270: Operators, Safety Items, Rosters and Shifts (A) - ILT
FLTOF275: Shift Change (A) - ILT
FLTOF300: System Architecture (E) - ILT
FLTOF310: System Administration (E) - ILT
FLTOF320: Spatial Mine Model Supervisor (E) - ILT
FLTOF325: Adding and Archiving Machines (E) - ILT
FLTOF330: Mining Block Management (E) - ILT
FLTOF340: Assignment Supervisor (E) - ILT
FLTOF345: Drill Cycle (E) - ILT
FLTOF350: Cycle Supervisor (E) - ILT

Fleet Onboard

Objective:
The Fleet Office - Onboard Training will provide the knowledge and skills a candidate must demonstrate to be deemed competent in using Fleet onboard screen to log in and out, view assignments, messages, activate delays, etc.

Courses Needed:
FLTON100: Operator Onboard Overview (F) - eLearning

Fleet Service - Level 1

Objective:
The Fleet Level 1 Service Training will 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) - eLearning
FLTSRV110: Operator Onboard Overview (F) - eLearning
FLTSRV120: GNSS Fundamentals (F) - eLearning
FLTSRV121: Fleet Onboard Hardware Installation (F) - ILT
FLTSRV130: Networking Fundamentals (F) - eLearning
FLTSRV131: Fleet Onboard Initial Software Installation (F) - ILT
FLTSRV151: Gen III Fleet Onboard (F) - ILT
FLTSRV161: Fleet Onboard for Sites with Command for Hauling (F) - ILT
GENSRV101: Resources and Documentation (F) - eLearning
GENSRV102: General Routing and Installation of Harness Best Practices (F) - eLearning

Fleet Service - Level 2

Objective:
The Fleet Level 2 Service Training will 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:
FLTOF100: Overview and Basics (F) - eLearning
FLTOF110: Introduction to the Spatial Mine Model (F) - eLearning
FLTOF150: Introduction to Delays (F) – eLearning

FLTOF160: Introduction to Cycles (F) - eLearning
FLTSRV210: Fleet Onboard display configuration (A) - ILT
FLTSRV220: Fleet Onboard commissioning (A) - ILT
FLTSRV230: Fleet Onboard Troubleshooting (A) - ILT
FLTSRV240: Fleet Onboard Troubleshooting via MineStar Client (A) - ILT
FLTSRV250: Gen III Fleet Onboard -Intermediate (A) - ILT
FLTSRV260: Fleet Onboard for sites with Command for Hauling - Intermediate (A) - ILT
GENSRV201: GNSS Fundamentals (A) - ILT
GENSRV202: Network Fundamentals (A) - ILT
GENSRV203: MineStar Service and Support (A) - ILT

Fleet Underground - Level 1

Objective:
The Fleet Level 1 Underground Training will provide the knowledge and skills a candidate must demonstrate in using Minetec systems.

Courses Needed:
UG_FLTSRV100: In Vehicle PC Display (F) - ILT
UG_FLTSRV105: Service Offboard (F) - ILT
UG_FLTSRV110: Service Onboard (F) - ILT
UG_FLTSRV200: Basic System Administration (A) - ILT

Fleet Underground - Level 2

Objective:
The Fleet Level 2 Underground Training will provide the knowledge and skills a candidate must demonstrate in using CAT MineStar Fleet Underground systems.

Courses Needed:
UG_FLTOF100: Fleet Office Overview (F) - ILT
UG_FLTOF190: General Processes (F) - ILT
UG_FLTOF200: Spatial Mine Model Building (A) - ILT
UG_FLTOF205: Adding and Archiving Machine (A) - ILT
UG_FLTOF210: Checking Monitoring and Moving Machine (A) - ILT
UG_FLTOF225: Material Tracking (A) - ILT
UG_FLTOF235: Assignments (A) - ILT
UG_FLTOF240: Assignment Troubleshooting (A) - ILT
UG_FLTOF245: Delays (A) - ILT
UG_FLTOF250: Cycles (A) - ILT
UG_FLTOF260: KPI Dashboards and Reporting (A) - ILT
UG_FLTOF265: Field Comms and Onboard Files (A) - ILT
UG_FLTOF270: Operators, Safety Items, Rosters, and Shifts (A) - ILT
UG_FLTOF275: Shift Change (A) - ILT
UG_FLTOF310: Systems Admin (E) - ILT

Terrain

Terrain Office - G&L

Objective:

The Terrain Grading and Loading Office Training will provide the knowledge and skills a candidate must demonstrate to be deemed competent to complete work using the MineStar Terrain Office systems for Grading and Loading applications. 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: Terrain Overview (F) - eLearning
TEROF113: Terrain Grading and Loading Set Points (F) - ILT
TEROF115: Terrain User Interface (F) - eLearning
TEROF120: Terrain Services (F) - eLearning
TEROF125: Terrain Grading and Loading Machines (F) - eLearning
TEROF130: Terrain Grading and Loading Onboard Lists (F) - eLearning
TEROF135: Terrain Support Processes (F) - eLearning
TEROF160: Terrain Grading and Loading Material Identification (F) - ILT
TEROF170: Terrain Grading and Loading Machine Configuration Utility (F) - ILT
TEROF205: Terrain Bounding Regions and Groups (A) - ILT
TEROF210: Terrain Grading and Loading Design Files (A) - ILT
TEROF215: Terrain Grading and Loading Design File Management (A) - ILT
TEROF235: Terrain Grading and Loading As-Build Surface Files (A) - ILT
TEROF240: Terrain Grading and Loading Manage Projects (A) - ILT
TEROF250: Terrain Grading and Loading Avoidance Zones and Surfaces (A) - ILT
TEROF255: Terrain Grading and Loading Avoidance Zones and Surfaces with Remote Control (A) - ILT
TEROF260: Terrain Grading and Loading Automatic Ore Status Maintenance (A) - ILT
TEROF265: Terrain Manage Events (A) - ILT
TEROF270: Terrain Reports and Productivity Files (A) - ILT
TEROF280: Terrain General Troubleshooting (A) - ILT

Terrain Office - Drilling

Objective:
The Terrain Drilling Office Training will provide the knowledge and skills a candidate must demonstrate to be deemed competent to complete work using the MineStar Terrain Office systems for Drilling applications.

Courses Needed:
TEROF1xx: Semi-Autonomous Drilling System (F) - eLearning
TEROF140: Terrain for Drilling User Interface (F) - ILT
TEROF145: Terrain for Drilling Machines (F) - ILT
TEROF150: Terrain for Drilling Onboard Lists (F) - ILT
TEROF155: Terrain for Drilling Messages (F) - ILT
TEROF225: Terrain for Drilling Patterns (A) - ILT
TEROF230: Terrain for Drilling Pattern Management (A) - ILT
TEROF245: Terrain for Drilling Projects (A) - ILT
TEROF275: Terrain for Drilling CAT Reports (A) - ILT

Terrain Onboard - G&L

Objective:
The Terrain Grading and Loading Onboard Training will provide the knowledge and skills a candidate must demonstrate to be deemed competent to complete work using the MineStar Terrain onboard systems for Grading and Loading applications. This includes but not limited to:

- Identifying the different onboard uses for Grading and Loading machine types
- Listing the advantages of Terrain-equipped machines
- Providing descriptions of machine types with specific configurations and onboard file types
- Describing all onboard system componentry
- Understanding the Terrain Grading and Loading User Interface
- Understanding procedures included in Starting of Shift and Shift Activities
- Demonstrating proper material identification for loading purposes

Courses Needed:
TEROF111: Terrain Overview (F) - eLearning
TEROF125: Terrain Grading and Loading Machines (F) - eLearning
TERON100: Terrain Overview (F) - eLearning
TERON101: G&L User Interface (F) - eLearning
TERON103: G&L Start of Shift (F) - eLearning
TERON105: G&L Shift Activities (F) - eLearning
TERON107: Terrain with Blade Control (F) - eLearning
TERON108: Managing Material Information (F) - eLearning
TERON110: LHD GIS Mode (F) - eLearning
TERSRV207: Terrain Blade Control Fusion (A) - ILT
TERSRV221: Terrain G&L Machine Configuration Utility (A) - ILT
TERSRV222: Terrain Grading and Loading Measure Up and Commissioning (A) - ILT

Terrain Onboard - Drilling

Objective:

The Terrain Drilling Onboard Training will 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:

TERON102: Drill User Interface (F) - eLearning
TERON104: Drill Start of Shift (F) - eLearning
TERON106: Drill Shift Activities (F) - eLearning
TERON111: Terrain Strata for Drilling (F) - eLearning

Terrain - G&L Service - Level 1

Objective:

The Terrain Service for Grading and Loading Level 1 will provide the knowledge and skills 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 Grading and Loading User interface (F) - eLearning
TERSRV100 - Overview of Terrain System (F) - eLearning
TERSRV101 - Terrain Machine and Software overview (F) - eLearning
TERSRV105 - Terrain Machines Track Type Tractors (F) - ILT
TERSRV111 - Terrain Grading and Loading G610 Software Installation (F) - ILT
TERSRV121 - Terrain Grading and Loading Hardware (F) - ILT
TERSRV122 – Terrain Grading and Loading Track Type Tractors ARO (F) - ILT
TERSRV123 - Terrain Loading Hardware for Excavators / Front Shovels (F) - ILT
GENSRV101: Resources and Documentation (F) - eLearning
GENSRV102: General Routing and Installation of Harness Best Practices (F) - ILT

Additional as Required:

TERSRV131 - Terrain Mobile (F) - ILT
TERSRV132 - Terrain Onboard for sites with Command for Hauling (F) - ILT

Terrain - G&L Service - Level 2

Objective:

The Terrain for Grading and Loading Level 2 Training will build on the learning from the Terrain for Grading and Loading foundational course Level 1 Training. This course is delivered by eLearning and Instructor led training with an instructional duration of ~29 hours (not including additional modules) and covers an 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: Terrain Overview (F) - eLearning
TEROF115: Terrain User Interface (F) - eLearning
TEROF125: Terrain Grading and Loading Machines (F) - eLearning
TERSRV221: Terrain G&L Machine Configuration Utility (A) - ILT
TERSRV222: Terrain Grading and Loading Measure Up and Commissioning (A) - ILT
TERSRV223: Terrain Loading Dual Antenna Excavator and Front Shovel Calibration (A)
GENSRV201 - GNSS Fundamentals (A) - ILT
GENSRV202: Network Fundamentals (A) - ILT
GENSRV203: MineStar Service and Support (A) - ILT

Additional as Required:

TERSRV232: Terrain System for Sites with Command for Hauling (A) – ILT

Terrain - Drilling - Service

Objective:

The Terrain Drilling – Service Training will provide the knowledge and skills for technicians that support the CAT MineStar Drilling and will provide an introduction to components, installation and configuration variations for Drill types, initial software installation, setup and configuration of the Terrain for Drilling system, calibration and service and support of the system.

Courses Needed:

TERSRV106: Terrain for Drilling Articulated Drills Hardware Install (F) - ILT
TERSRV107: Terrain for Drilling PLC Drill Hardware Install (F) - ILT
TERSRV108: Terrain for Drilling I/O Drills Hardware Install (F) - ILT
TERSRV205: Terrain for Drilling File Structure (A) - ILT
TERSRV210: Terrain for Drilling 6.x Image Backup (A) - ILT
TERSRV215: Terrain for Drilling 7.x Hardware Update (A) - ILT
TERSRV220: Terrain for Drilling 7.x Software Installation (A) - ILT
TERSRV225: Terrain for Drilling 7.x Software Upgrade (A) - ILT
TERSRV230: Terrain for Drilling Setup & Configuration (A) - ILT
TERSRV235: Terrain for Drilling 7.x Calibration (A) - ILT
TERSRV240: Terrain for Drilling Strata (A) – ILT
GENSRV101: Resources and Documentation (F) - eLearning

Command

Command for Hauling - Office/Onboard - SIM School

Objective:

The Command for Hauling Office/Onboard SIM School will 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: Introduction to Command for Hauling Office (F) - eLearning
AHS_COMOF110: Introduction to Surface Management (F) - eLearning
AHS_COMOF120: Introduction to Lanes and Zones (F) - eLearning
AHS_COMOF130: Introduction to Load Planning (F) - eLearning
AHS_COMOF140: Introduction to Dump Planning (F) - eLearning
AHS_COMOF150: Introduction to Stations (F) - eLearning
AHS_COMOF160: Introduction to Mine Model Management (F) - eLearning
AHS_COMOF170: Introduction to the Autonomy Status Page (F) - eLearning
AHS_COMOF180: Introduction to the Site Monitor Page (F) - eLearning
AHS_COMOF190: Introduction to the Traffic Management Page (F) - eLearning
AHS_COMOF199: Command for Hauling Foundational - VOC (F) - ILT
AHS_COMOF200: Managing Autonomous Traffic (A) - ILT
AHS_COMOF205: Surface Management (A) - ILT
AHS_COMOF210: Surface Editor (A) - ILT
AHS_COMOF215: Lanes (A) - ILT
AHS_COMOF220: Zones (A) - ILT
AHS_COMOF230: Load Planning (A) - ILT
AHS_COMOF240: Dump Planning (A) - ILT
AHS_COMOF250: Stations (A) - ILT
AHS_COMOF255: Refueling AMT (A) - ILT
AHS_COMOF260: Mine Model Management (A) - ILT
AHS_COMOF270: Inside the Office Area (A) - ILT
AHS_COMOF280: Autonomy Status Page (A) - ILT
AHS_COMOF285: Using Site Monitor (A) - ILT
AHS_COMOF290: Traffic Management Page (A) - ILT
AHS_COMOF295: Shift Change (A) - ILT
AHS_COMOF299: Command for Hauling Intermediate - VOC (A) - ILT
AHS_COMON100: Introduction to Command for Hauling Autonomous Operations (F) - eLearning
AHS_COMON110: Introduction to A-Stop Operations (Inside the AOZ - Entering the AOZ) (F) - eLearning
AHS_COMON120: Introduction to Operate a Vehicle in the AOZ (F) - eLearning
AHS_COMON125: Introduction to Aux Panel Operations (Inside the AOZ - Entering the AOZ) (F) - eLearning
AHS_COMON130: Introduction to Terrain Grading in the AOZ (Inside the AOZ - Terrain G&L) (F) - eLearning
AHS_COMON140: Introduction to Terrain Loading in the AOZ (Inside the AOZ - Terrain G&L) (F) - eLearning
AHS_COMON150: Introduction to Operations Inside the AOZ (Command Office Team) (F) - eLearning

AHS_COMON160: Introduction to Mode Changing AMT (F) - eLearning
AHS_COMON199: Introduction to Command for Hauling Onboard - VOC (F) - eLearning
AHS_COMON200: Inside the AOZ (Command Office Team) (A) - ILT
AHS_COMON210: Mode Changing and Refueling AMT (A) - ILT

Command for Hauling - Service - Level 1

Objective:

The Command for Hauling Service Level 1 Training 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: Intro to the Cat Autonomous Haul System (F) - eLearning
AHS_COMSRV110: AHS-Base Machine Considerations (F) - eLearning
AHS_COMSRV120: VIMS/Autonomy (F) - eLearning
AHS_COMSRV130: GNSS Fundamentals (F) - eLearning
AHS_COMSRV140: Networking Fundamentals (F) - eLearning
AHS_COMSRV150: 793F Command Assembly (F) - ILT
AHS_COMSRV160: 793F Command Maintenance and Service (F) - ILT
AHS_COMSRV170: Introduction to MineStar Client (Autonomy) (F) - ILT
AHS_COMSRV180: Field Troubleshooting and Repair (F) - ILT
AHS_COMSRV199: Onsite Exposure/Competency Journal (F) - ILT

Additional as Required:

TERSRV100: Overview of Terrain System (F) - eLearning
TERSRV101: Terrain Machines & Software Overview (F) - eLearning
FLTSRV100: MineStar Fleet Onboard Introduction (F) - eLearning
FLTSRV110: Operator Onboard Overview (F) - eLearning
FLTSRV121: Fleet Onboard Hardware Installation (F) - ILT
FLTSRV131: Fleet Onboard Initial Software Installation (F) - ILT
FLTSRV151: Gen III Fleet Onboard -Foundational (F) - ILT
FLTSRV161: Fleet Onboard for sites with Command for Hauling -Foundational (F) - ILT
AHS_COMON200: Inside the AOZ (Command Office Team) (A)
AHS_COMON210: Mode Changing and Refueling AMT (A)
GENSRV201: GNSS Fundamentals (A)

Command for Hauling - Service - Level 2

Objective:
The Command for Hauling Service Level 2 Training 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 in AMT Locations (A) - ILT
AHS_COMSRV210: Using the AMT (A) - ILT
AHS_COMSRV220: Setup, Configuration, Calibration of an Autonomous Mining Truck (A) - ILT
AHS_COMSRV230: Setup, Configuration, Calibration OJT (A) - ILT

Command for Dozing (SATS) - Operator

Objective:
The Command for Dozing SATS - Operator Training will provide the knowledge and skills 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) - ILT
DOZ_COMSATS401: SATS for Operators (E)

Command for Dozing (SATS) - Service

Objective:
The Command for Dozing SATS - Service Training will 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) - ILT
DOZ_COMSRV103: CFD: Installing Hardware for Remote-Control (F) - ILT
DOZ_COMSRV106: Install Vision System (F) - ILT
DOZ_COMSRV107: Installing Software on the Machine (F) - ILT
DOZ_COMSRV108: Install Software on and Calibrate the Operator Station (F) - ILT
DOZ_COMSRV109: Calibrating, Operating, and Commissioning the Operator Console (F) - ILT
DOZ_COMSRV200: Basic Operator Station Functions (A) - ILT
DOZ_COMSRV300: Commissioning and Troubleshooting CFD Systems (E) - ILT

Command for Dozing Remote Console - Operator

Objective:
The Command for Dozing Remote Console- Operator Training will 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 advanced operation of the system
- Basic Troubleshooting of the system

Courses Needed:
DOZ_COMOCOP100: Operator Console for Operators (F) - ILT

Command for Dozing Remote Console - Service

Objective:
The Command for Dozing Remote Console - Service Training will 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) - ILT
DOZ_COMSRV103: CFD: Installing Hardware for Remote-Control (F) - ILT
DOZ_COMSRV300: Commissioning and Troubleshooting CFD Systems (E) - ILT

Command for Dozing Remote Station - Operator

Objective:
The Command for Dozing Remote Station - Operator Training will 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 advanced operation of the system
- Basic Troubleshooting of the system

Courses Needed:
DOZ_COMOSOP100: Operator Station for Operators (F) - ILT

Command for Dozing Remote Station - Service

Objective:

The Command for Dozing Remote Station - Service Training will 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) - ILT
DOZ_COMSRV103: CFD: Installing Hardware for Remote-Control (F) - ILT
DOZ_COMSRV106: Install Vision System (F) - ILT
DOZ_COMSRV107: Installing Software on the Machine (F) - ILT
DOZ_COMSRV108: Install Software on and Calibrate the Operator Station (F) - ILT
DOZ_COMSRV109: Calibrating, Operating, and Commissioning the Operator Console (F) - ILT
DOZ_COMSRV200: Basic Operator Station Functions (A) - ILT
DOZ_COMSRV300: Commissioning and Troubleshooting CFD Systems (E) - ILT

Command for Underground MXZ - Service

Objective:

The Command for Underground MXZ - Service Training will 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_COMROS220: Operation Station - Hardware (A) - ILT
UG_COMROS230: Operator Station - Software (A) - ILT
UG_COMROS240: Operations (A) - ILT
UG_COMAA-MXZL100: Automation Area Overview (F) - ILT
UG_COMAA-MXZL110: Area Isolation System Overview (F) - ILT
UG_COMAA-MXZL120: Local Area Radio Network Overview (F) - ILT
UG_COMAA-MXZL200: LARN Components and Operation (A) - ILT
UG_COMAA-MXZL210: Area Isolation System (A) - ILT
UG_COMMAS300: Machine Automation System Components and Operation - Lite (E) - ILT
UG_COMMAS310: Machine Automation System Components and Operation (E) - ILT
UG_COMMAS320: Machine Automation Remote Control Systems - Lite (E) - ILT
UG_COMMAS330: Machine Automation Remote Control Systems (E)
UG_COMSYS250: MAS Operations Training (A)
UG_COMSYS330: Command for Underground Maintenance Training (E)

Product Introduction

MineStar Product Introduction Courses

Objective:

The MineStar Product Introduction Courses are consisting of videos and presentations about Fleet, Terrain, Detect, Health, and Command. These courses will provide a brief introduction to the product a candidate must learn before taking the rest of the modules.

Courses Available:

PRDOVR101: MineStar Overview
PRDOVR102: MineStar Fleet Product Overview
PRDOVR103: MineStar Terrain Product Overview
PRDOVR104: MineStar Detect Product Overview
PRDOVR105: MineStar Health Product Overview
PRDOVR106: MineStar Command Product Overview

Course Description

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.

Fleet Office - Controller and Builder

FLTOF100: Overview and Basics (F)
This course covers an overview of Fleet Office, its capability sets in the suite of MineStar products, and key terms. It also includes basic system navigation such as page configurations, consoles, and desktops.

FLTOF110: Introduction to the Spatial Mine Model (F)
This course explains the critical processes and MineStar functionality that you must understand in the context of the Spatial Mine Model.

FLTOF120: Introduction to Material Tracking (F)
This course explains the critical processes and MineStar functionality that you must understand for the tracking of materials.

FLTOF130: Introduction to Assignment (F)
This course explains the critical processes and MineStar functionality that you must understand for MineStar assignments. Assignment is one of Fleet's most powerful features. In this course, you will learn how the Assignment engine works and how to interact with it. This course will cover machine availability and assignability, restrictions, queue tolerance, and issuing of assignments.

FLTOF140: Introduction to Fueling and TKPH (F)
This course provides learners with an introduction to Fueling and TKPH within Fleet Office. This course also discusses about monitoring the Fueling and TKPH within Fleet Office.

FLTOF150: Introduction to Delays (F)
This course will provide learners with an introduction to Delays. This course also discusses an introduction about delay concepts, creating, editing, and stopping a delay.

FLTOF160: Introduction to Cycles (F)
This course covers an introduction to cycles including an overview of the data found within cycles, where to review cycles, and some tips for identifying cycles which might need to be edited.

FLTOF170: Introduction to Messaging (F)
This course covers the critical processes and MineStar functionality that you must understand operator and office messaging.

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 (A)
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 (A)
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 (A)
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 (A)
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 (A)
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 (A)
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 (A)
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 (A)
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 (A)
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 (A)
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 (A)
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 (A)
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 (A)
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 (A)
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.

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.

Fleet Service

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.

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.

FLTSRV130: Networking Fundamentals (F)
This course provides an introduction to common networking components, terminology and how MineStar equipment communicates from the Onboard to the Office.

FLTSRV151: Gen III Fleet Onboard (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 (F)
This course explains how an Operator uses the Fleet onboard screen to log in and out, view assignments, messages, activate delays, etc.

FLTSRV250: Gen III Fleet Onboard - Intermediate (A)
This course explains how an Operator uses the Fleet onboard screen to log in and out, view assignments, messages, activate delays, etc.

FLTSRV260: Fleet Onboard for sites with Command for Hauling - Intermediate (A)
This course explains how an Operator uses the Fleet onboard screen to log in and out, view assignments, messages, activate delays, etc.

Fleet Underground

UG_FLTSRV100: In Vehicle PC Display (F)
The purpose of this course is to introduce basic vehicle PC operations. The modules available in this course will give a good overall understanding of the hardware and software components of the device, and how the in-vehicle PC is used in various application and its common elements.

UG_FLTSRV105: Service Offboard (F)
This course provides an overview of the hardware available for Fleet Underground vehicles. It has three modules which discuss the properties of different Wi-Fi, cables, and connectors installation. The topics highlighted per module are about, parts, features, pre-installation activities, mounting locations and options, assembly and installation, LED activity, best practices, and troubleshooting procedure which provides learner a deep understanding about the vehicle hardware.

UG_FLTSRV110: Service Onboard (F)
This course provides details about hardware assembly and installation of the devices. Discussed here are the devices which are attached and assembled for either heavy or light vehicles used in underground mining. The devices included are PDPU, mobile node, and in-vehicle PC.

This course also has an overview of the Product Link Elite (PLE) and the necessary configuration needed for it to be used.

UG_FLTSRV200: Basic System Administration (A)
This course covers the basic guide to fully understand the Minetec suite and the implications of making configuration changes in MineOffice.

UG_FLTOF100: Fleet Office Overview (F)
The purpose of this course is to introduce users to Fleet for Underground and Minetec MineOffice. Features and functions of Fleet for Underground's different subsystems, and how they are integrated with each other to achieve efficient and safe mine operation are also discussed. MineOffice software products are also covered in this course for the setup and configuration of Minetec hardware and applications.

UG_FLTOF190: General Processes (F)
This course discusses the different general processes such as remotely connecting to MineStar onboard systems, changing IP address, applying shift production plan, and managing machine pre-start issues. Levels of escalation for support is also covered here.

UG_FLTOF200: Spatial Mine Model Building (A)
This course covers a step-by-step process on how to build and set up a spatial mine model. This starts with discussing all about dxf files which contains topographical information about a mine site, followed by adding draw points and ore pass to the mine model. Draw points and ore pass management – editing properties, archiving, and deleting – are also demonstrated. Lastly, the created mine model is validated.

UG_FLTOF205: Adding and Archiving Machine (A)
This course illustrates the load haul dump (LHD) hierarchy and covers the process of adding machine classes and individual machines. For maintenance, the process of archiving and restoring machines within Fleet Office are also discussed.

UG_FLTOF210: Checking Monitoring and Moving Machine (A)
This course covers pinging a machine to check network connectivity. Navigating the Load Haul Dump (LHD) Assistant is discussed to monitor machine information, also the Site Monitor which displays graphical representation of the mine, machines, and operators. Setting up delays is also discussed to create better machine assignments.

UG_FLTOF225: Material Tracking (A)
This course explains the concepts of grades, material, and mining block within MineStar and how to add them to track and record the geology model of the site.

UG_FLTOF235: Assignments (A)
This course discusses how the assignment engine works and how to interact with it, as well as machine availability and assignability. Assignment groups and restrictions due to machine compatibility are also discussed. This is followed by a step-by-step procedure on how to set/review/manage assignments. Reassignment waypoints, setting up scheduled assignments, supervisor settings, and assignment behaviors are also covered here.

UG_FLTOF240: Assignment Troubleshooting (A)
This course demonstrates how to identify machines with failed assignments and how to utilize the assignment context in determining why an assignment failed. Based on the reasons listed, you can accurately determine which page to open to continue investigating the issue. This is followed by the appropriate troubleshooting steps depending on the cause of assignment failure. Lastly, Loader Comparison tool is discussed to understand why trucks are assigned to one loading tool over another.

UG_FLTOF245: Delays (A)
This course covers the adding delay types and activities (for advanced roles) and managing current and historical delays within Fleet Office.

UG_FLTOF250: Cycles (A)
This course discusses cycles and its importance in identifying inefficiencies and measuring improvements. Step-by-step procedure on cycle or cycle activity management – create/review/ edit/split/merge –, and bulk cycle editing, and supervisor cycle settings are also covered here.

UG_FLTOF260: KPI Dashboards and Reporting (A)
This course discusses the different components of dashboard and reporting such as KPI, tonnage, availability, shift tonnes, cycle activity times, draw card compliance, shift, payload, and others. Adjusting dashboard limits and recalculating KPI summaries are also discussed here.

UG_FLTOF265: Field Comms and Onboard Files (A)
This course covers the component of MineStar communications which includes filed and load events. This helps in understanding how MineStar transfers data for troubleshooting issues.

UG_FLTOF270: Operators, Safety Items, Rosters, and Shifts (A)
This course demonstrates how to manage personnel and users, personal items, and rosters.

UG_FLTOF275: Shift Change (A)
This course reviews and provides Caterpillar-suggested guidelines for handover/change of shift processes. It also covers how the shift change tool within Fleet Office functions and how it can improve the efficiency of shift change.

UG_FLTOF310: Systems Admin (E)
This course discusses various technical tasks such as maintaining disk space and database, reviewing and scheduling patches, installing Fleet Client, and maintaining snapshots.

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.

Terrain Office

TEROF1xx: Semi-Autonomous Drilling System (F)
This course covers the process of adding an autonomous machine, Terrain Office features, drill plans and exclusion zone, and reporting.

TEROF111: Terrain Overview (F)
The purpose of this course is to introduce users to Terrain Office. It discusses the advantages and benefits of using Terrain, the different applications that are used in conjunction with it, and the important system components that make it work.

TEROF113: Terrain Grading and Loading Set Points (F)
This course covers the basic concepts of set point.

TEROF115: Terrain 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 here, 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.

TEROF120: Terrain Services (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: Terrain Grading and Loading Machines (F)
This course covers the process of creating models, adding, removing, configuring and shutting down machines using Terrain Office. The configuration of machines using the Machine Configuration Utility (MCU) tool is covered in this course and shows how to connect these machines to Terrain Office. 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: Terrain Grading and Loading 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.

TEROF135: Terrain Support Processes (F)
Learning when and how to document cases should something not work as expected in the Terrain system is important to ensure that disruptions are kept to a minimum. This course covers the product support tiers, support processes, and data handling for support analysis. Additionally, it provides necessary contact details for users to take note of to guarantee that concerns are handled with urgency.

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 (F)
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.

TEROF155: Terrain for Drilling Messages (F)
This course will enable learners to create custom or use message templates and send them to machines.

TEROF160: Terrain 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.

TEROF170: Terrain Grading and Loading Machine Configuration Utility (F)
This course covers the features and settings of MCU, also step-by-step process on how to add, configure, and upgrade MCU.

TEROF205: Terrain Bounding Regions and Groups (A)
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 (A)
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 (A)
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.

TEROF225: Terrain for Drilling Patterns (A)
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. This also 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 (A)
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 (A)
This course covers the As-Build surface files and a deeper understanding of current elevation time and how to convert DXF to current elevation time design file. This will also tackle the process of creating an update layer to a machine.

TEROF240: Terrain Grading and Loading Manage Projects (A)
This course focuses on the functionality of Manage Projects. It also includes the process of sending and requesting projects from a Terrain machine.

TEROF245: Terrain for Drilling Projects (A)
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 (A)
This course covers avoidance zones and avoidance zone surfaces and how to configure them. Different warnings and alarms displayed to the operators will also be discussed.

TEROF255: Terrain Grading and Loading Avoidance Zone and Surfaces with Remote Control (A)
This course covers avoidance zones and avoidance zone surfaces and how it interacts with Command for Dozing.

TEROF260: Terrain Grading and Loading Automatic Ore Status Maintenance (A)
Participants will be taught how to configure AOSM and material file storage onboard.

TEROF265: Terrain Manage Events (A)
This course covers how to manage events and detailed description of data export types.

TEROF270: Terrain Reports and Productivity Files (A)
Participants will learn about setting up the Productivity files in Terrain Office.

TEROF275: Terrain for Drilling CAT Reports (A)
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 General Troubleshooting (A)
This course covers processes on how to set up coordinates systems, shut down, reboot, and ping a machine, ping a trace route, and connect with VPNC and Phindows. The server disk space review is also covered as part of advanced troubleshooting.

Terrain 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)
This course covers working with the G&L user interface, adjusting the interface user settings, avoidance zones, and positional awareness.

TERON102: Drill User Interface (F)
This course identifies the components used for the Terrain for Drilling onboard system, to include operator interaction with the onboard drilling display.

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 of Shift (F)
This course covers the initial activities and procedures that operators will go through at the beginning of the work shift on Terrain for Drilling machine types.

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)
This course covers procedures for drilling holes on Terrain for Drilling machine types to include; tramming to a hole, leveling a drill, drilling a hole, editing a drill hole pattern, and monitoring strata.

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.

TERON111: Terrain Strata for Drilling (F)
This course covers function of the Strata Recognition Option for Drilling, adjusting the interface settings and working with the onboard drilling display.

Terrain Service

TERSRV100: Terrain System Overview (F)
This course is an 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 and Software Overview (F)
This course is an overview of Terrain machines and the Terrain system hardware components used for each type of machine. The course also contains an overview of the Terrain Office software structure.

TERSRV105: Terrain Service Kit (F)
The purpose of this course is to provide the knowledge and skills a candidate must demonstrate to be deemed competent to complete work using the MineStar Terrain for Grading and Loading applications.

TERSRV106: Terrain for Drilling Articulated Drills Hardware Install (F)
Participants will learn safety precautions and the Terrain hardware installation processes for articulated drills.

TERSRV107: Terrain for Drilling PLC Drill Hardware Install (F)
Participants will learn safety precautions and the Terrain hardware installation processes for PLC drills.

TERSRV108: Terrain for Drilling I/O Drills Hardware Install (F)
Participants will learn safety precautions and the Terrain hardware installation processes for I/O drills.

TERSRV111: Terrain Grading and Loading G610 Software Installation (F)
This course covers a step-by-step procedure on how to properly install Terrain Office.

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.

TERSRV122: Terrain Grading and Loading Track Type Tractors ARO (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.

TERSRV205: Terrain for Drilling File Structure (A)
This course covers the Terrain Drilling folder structure, provides an overview on how to FTP and Putty into the drill screen, how to open a CMD shell within Phindows, and how to take configuration backup remotely.

TERSRV207: Terrain Blade Control Fusion (A)
This course covers the Terrain Blade Control features, functions, components, and configuration together with an architecture of its system. This also includes the changes in Terrain and Blade Control user interface. The licenses, fundamentals of UTS, and GNSS refresher are included here as well.

TERSRV210: Terrain for Drilling 6.x Image Backup (A)
This course provides the knowledge and skills a candidate must demonstrate to be deemed competent to complete work using the MineStar Terrain for Drilling applications.

TERSRV215: Terrain for Drilling 7.x Hardware Update (A)
This course provides the knowledge and skills a candidate must demonstrate to be deemed competent to complete work using the MineStar Terrain for Drilling applications.

TERSRV220: Terrain for Drilling 7.x Software Installation (A)
This course provides the knowledge and skills a candidate must demonstrate to be deemed competent to complete work using the MineStar Terrain for Drilling applications.

TERSRV221: Terrain G&L Machine Configuration Utility (A)
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 (A)
This course provides the knowledge and skills a candidate must demonstrate to be deemed competent to complete work using the MineStar Terrain for Grading and Loading applications.

TERSRV223: Terrain Loading Dual Antenna Excavator and Front Shovel Calibration (A)
This course covers the programming and calibration for dual antenna loading machines.

TERSRV225: Terrain for Drilling 7.x Software Upgrade (A)
This course provides the knowledge and skills a candidate must demonstrate to be deemed competent to complete work using the MineStar Terrain for Drilling applications.

TERSRV230: Terrain for Drilling Setup & Configuration (A)
This course covers the Drill Interface Module configuration, initial setup of the drill system, and GPS configuration and validation.

TERSRV232: Terrain System for Sites with Command for Hauling (A)
This course covers the programming and calibration for dual antenna loading machines.

TERSRV235: Terrain for Drilling 7.x Calibration (A)
This course provides the knowledge and skills a candidate must demonstrate to be deemed competent to complete work using the MineStar Terrain for Drilling applications.

TERSRV240: Terrain for Drilling Strata (A)
This course provides the knowledge and skills a candidate must demonstrate to be deemed competent to complete work using the MineStar Terrain for Drilling applications.

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.

Command for Hauling - Office

AHS_COMOF100: Introduction to Command for Hauling Office (F)
This course provides an overview of key information regarding the operation of autonomous trucks and some common elements of the Command Office client.

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

AHS_COMOF180: Introduction to the Site Monitor Page (F)
This course outlines the meaning of the different components of Site Monitor, and includes how to use all of the tools available from the page.

AHS_COMOF190: 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.

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

AHS_COMOF205: Surface Management (A)
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 (A)
This course addresses the functionalities and tools available on the Surface Editor page within the Command Office system.

AHS_COMOF215: Lanes (A)
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 (A)
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_COMOF230: Load Planning (A)
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 (A)
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 (A)
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 (A)
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 (A)
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 (A)
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 (A)
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 (A)
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 (A)
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 (A)
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 Advanced - VOC (A)
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.

Command for Hauling - 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.

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 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) (A)
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 (A)
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.

Command for Hauling - Service Level 1

AHS_COMSRV100: Introduction to the Cat Autonomous Haulage 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 Command for Hauling System.

AHS_COMSRV130: GNSS Fundamentals (F)
This course explains the fundamentals on the operation of High Precision GNSS and how Cat® MineStar™ System utilizes 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 introduces key MineStar Autonomous Mining Features and Interactions.

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 is an onsite practical checklist that is completed under observation of a Qualified Command Instructor or Subject Matter Expert. The checklist/journal will be made available on completion of the preceding Level 1 Command Service Courses. The checklist covers: Basic safety/hazard awareness/swp usage. Identify Autonomy Layer components. Perform maintenance and assembly tasks for Autonomy Layer. Perform base machine calibrations. Remote diagnostics and Client navigation.

Command for Hauling - Service Level 2

AHS_COMSRV200: Command for Hauling – Check Driving in AMT Locations (A)
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 (A)
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 (A)
This course covers task to Setup, Configure and Calibrate an Autonomous Mining Truck.

AHS_COMSRV230: Setup, Configuration, Calibration OJT (A)
This course is the practical session to perform setup, configuration and perform calibrations on an Autonomous Mining Truck.

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.

Command for Underground - Service

UG_COMROS220: Operator Station - Hardware (A)
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_COMROS230: Operator Station - Software (A)
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.

UG_COMROS2430: Operations (A)
This operational course provides training on the LARN, AIS and both machine and personnel barriers.

UG_COMAA-MXZL100: 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 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-MXZL110: Area Isolation System Overview (F)
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-MXZL120: Local Area Radio Network Overview (F)
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-MXZL200: LARN Components and Operation (A)
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-MXZL210: Area Isolation System (A)
This course provides a deeper look on the Area Isolation System and its components.

UG_COMMAS300: Machine Automation System Components and Operation - Lite (E)
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_COMMAS310: Machine Automation System Components and Operation (E)
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_COMMAS320: 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.

UG_COMMAS330: 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_COMSYS250: MAS Operations Training (A)
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 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.

Command for Dozing - Operator

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_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_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.

Command for Dozing - Service

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

DOZ_COMSRV108: Install Software on and Calibrate the Operator Station (F)
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 (F)
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 (A)
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.

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 Routing and Installation of Harness Best Practices (F)
This course covers basic Terrain Foundational Concepts including best Practices for Routing and Installation of harnesses, servicing Deutsch Connector, explain Different Types of Deutsch Pins, identifying faults with circuit continuity and CAN Resistance Process on weather Proofing coaxial cables.

GENSRV201: GNSS Fundamentals (A)
This course provides the knowledge and skills a candidate must demonstrate to be deemed competent to complete work using the MineStar Terrain for Grading & Loading applications.

GENSRV202: Network Fundamentals (A)
This course provides an introduction to common networking components, terminology and how MineStar equipment communicates from the Onboard to the Office.

GENSRV203: MineStar Service and Support (A)
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