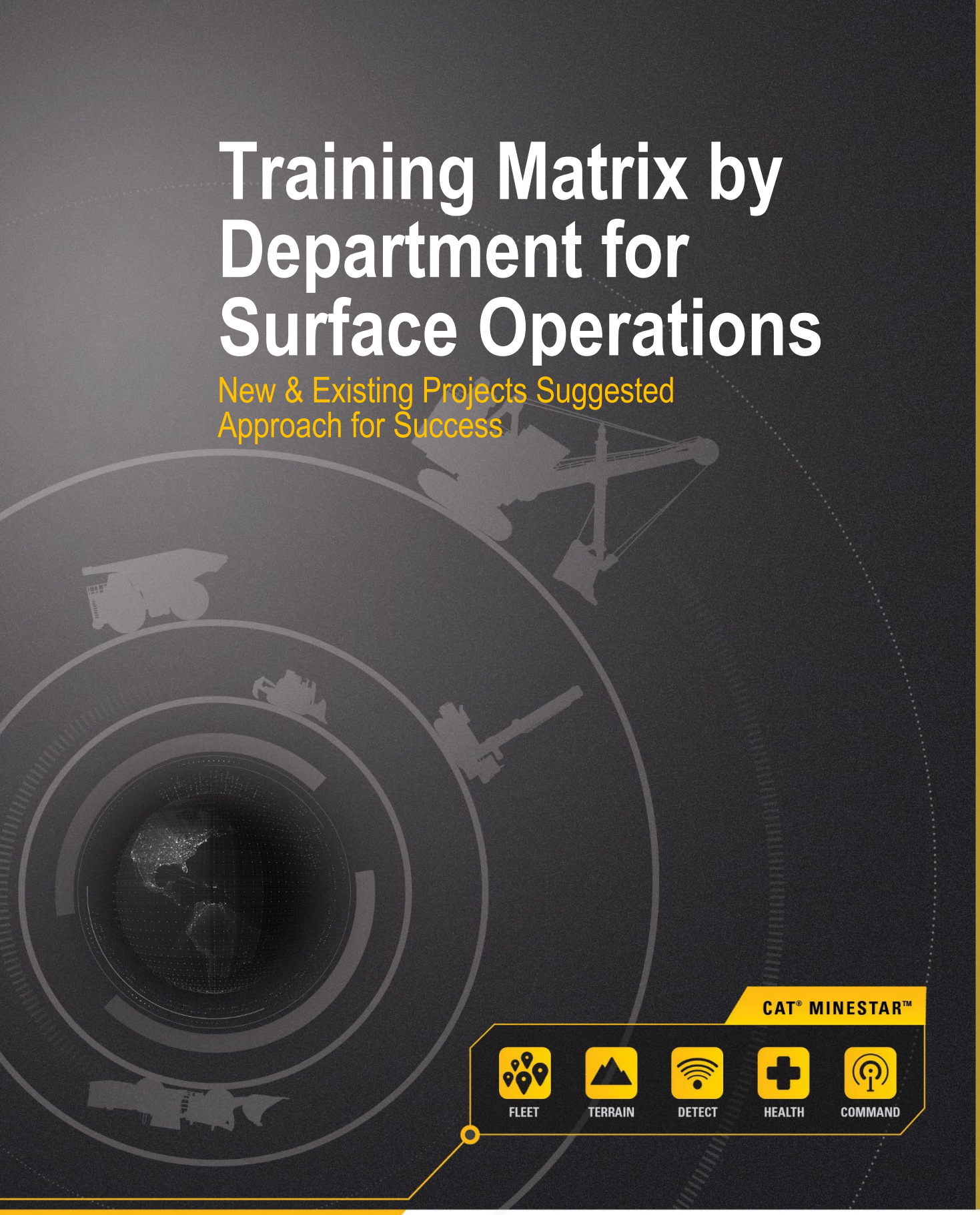
Training Matrix by Department for Surface Operations

New & Existing Projects Suggested Approach for Success



CAT® MINESTAR™

FLEET | TERRAIN | DETECT | HEALTH | COMMAND

CATERPILLAR®

CAT MINESTAR

TRAINING PATHWAYS FOR SUCCESS

PARTNERING FOR SUCCESS

THE CATERPILLAR TRAINING PATHWAY THAT'S BUILT ON SUCCESS

eLearning is the pre-requisite for all Office based course offerings and provides a solid foundational base knowledge of the course material that will be covered in the instructor lead course.
This is also the source for MineStar Office upgrade information.
Employees have unlimited access to review all previously completed eLearning modules as they require to refresh their memory.

Autonomous Operating Zone (AOZ) is the foundational safety concepts required to work in and around and autonomous mining operation using Caterpillars global best practices.

Sim Lite is for employees who wont need to use the system itself but requires an understanding of the MineStar suite for their job roles

Pit Technician training covers aspects of the equipment required to make a haul truck run autonomously and the skillsets to build portions of an autonomous mine with key concepts focusing on in-field production efficiencies.

Fleet Office provides an in-depth learning experience utilizing the MineStar Fleet Management System to track, manage and assign all haul trucks on your site.

Terrain Office provides the skills to interact with files used for production operations. Ideally suited to Controllers, Builders and departments responsible for creating, modifying and uploading designs and mining blocks.

Command for Hauling Office starts with the foundational knowledge and skills to build and monitor an autonomous mine site including the assignment of AMT's. The course then builds on the foundational core concepts and further expands the user's knowledge via additional complex planning scenarios, troubleshooting, working with the advanced settings to encourage high throughput productivity and team building skills by developing each learner to an intermediate level user.

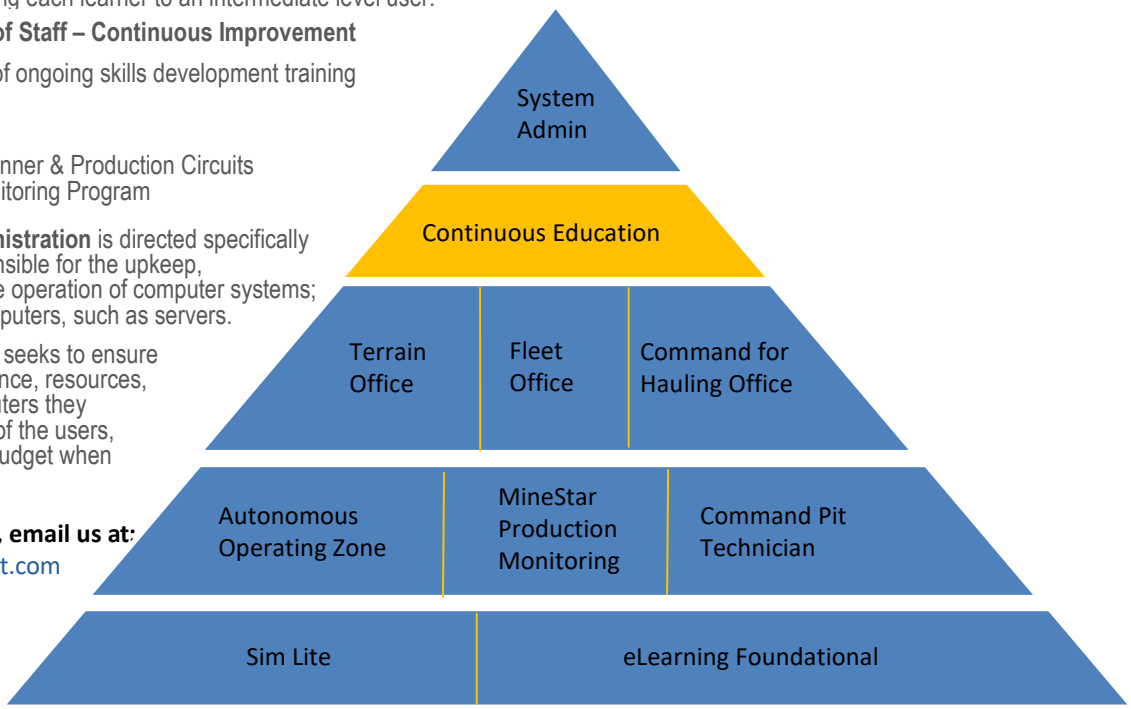
Ongoing Development of Staff – Continuous Improvement

Caterpillar have a range of ongoing skills development training programs such as;

- MCUI Training
- Assignment Planner & Production Circuits
- Production Monitoring Program

MineStar System Administration is directed specifically to a person who is responsible for the upkeep, configuration, and reliable operation of computer systems; especially multi-user computers, such as servers.

The system administrator seeks to ensure that the uptime, performance, resources, and security of the computers they manage meet the needs of the users, without exceeding a set budget when doing so.



For more information, email us at:
MineStar_Training@cat.com

MineStar Control Operations

Course Name:	Delivered by:	Classroom Hrs / Days	Control Room Supervisor	MineStar Controller	MineStar Builder	MineStar Pit Technician
AOZ Onboard						
AOZ Module 1: Introduction	Site L&D	2 Hrs	Required	Required	Required	Required
AOZ Module 2: Operate in AOZ	Site L&D	2 Hrs	Required	Required	Required	Required
AOZ Module 3: Terrain Dozing	Site L&D	2 Hrs	Optional	Optional	Optional	Required
AOZ Module 4: Terrain Loading	Site L&D	2 Hrs	Optional	Optional	Optional	Required
AOZ Module 6: Maintenance and Refueling	Site L&D	2 Hrs	Required	Required	Required	Required
MineStar Operation						
Sim Lite	Caterpillar	3 days				
Command Office Sim School Foundations	Caterpillar	5 days	Required	Required	Required	
Command Office Sim School Intermediate	Caterpillar	5 days	Required	Required	Required	
Fleet Office	Caterpillar	5 days	Required	Required	Required	
Fleet Office Onboard	Site L&D	OJT - AOZ	Optional	Optional	Required	Optional
Terrain Office (AHS / staffed)	Caterpillar	4 days	Required	Required	Required	Optional
Terrain Onboard	Site L&D	OJT - AOZ	Optional	Optional	Required	Optional
Pit Technician	Caterpillar	5 days				Required
Fleet Controller (staffed site)	Caterpillar	5 days	Required	Required	Optional	
Fleet Builder (staffed site)	Caterpillar	5 days	Required	Optional	Required	
Continuous Education						
MineStar Production Monitoring	Caterpillar	2 days	Optional	Optional		
MineStar Controller User Interface	Caterpillar	2 days	Optional	Optional		
Assignment Planner	Caterpillar	2 days	Optional	Optional		
MineStar Systems Administration	Caterpillar	5 days	Optional	Optional	Optional	

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Training Matrix by Department

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Mining Departments

Course Name:	Delivered by:	Classroom Hrs / Days	Site Trainer / Assessor	Crew Trainer	Mining Systems Field Support	Mining Systems Engineering	Technical Services	Facility Services Cleaners
AOZ Onboard								
AOZ Module 1: Introduction	Site L&D	2 Hrs	Required	Required	Required	Required	Required	Required
AOZ Module 2: Operate in AOZ	Site L&D	2 Hrs	Required	Required	Required	Required	Required	Required
AOZ Module 3: Terrain Dozing	Site L&D	2 Hrs	Required	Required				
AOZ Module 4: Terrain Loading	Site L&D	2 Hrs	Required	Required				
AOZ Module 6: Maintenance and Refueling	Site L&D	2 Hrs	Required	Required				
MineStar Operation								
Sim Lite	Caterpillar	3 days	Optional	Optional	Optional	Optional	Optional	Optional
Command Office Sim School Foundations	Caterpillar	5 days			Optional	Optional		
Command Office Sim School Intermediate	Caterpillar	5 days						
Fleet Office	Caterpillar	5 days			Optional	Optional		
Fleet Office Onboard	Site L&D	OJT - AOZ						
Terrain Office (AHS / staffed)	Caterpillar	4 days			Optional	Optional	Optional	
Terrain Onboard	Site L&D	OJT - AOZ						
Pit Technician	Caterpillar	5 days	Optional					
Continuous Education								
MineStar Production Monitoring	Caterpillar	2 days						
MineStar Controller User Interface	Caterpillar	2 days						
Assignment Planner	Caterpillar	2 days						
MineStar Systems Administration	Caterpillar	5 days				Optional	Optional	

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Maintenance Departments

Course Name:	Delivered by:	Classroom Hrs / Days	Maint. Team Aux	AHS Maint. Hauling	Maint. Team Fabrication	Maint. Service Person	AHS Maint. Supervisor	Maint. Superintendent
AOZ Onboard								
AOZ Module 1: Introduction	Site L&D	2 Hrs	Required	Required	Required	Required	Required	Required
AOZ Module 2: Operate in AOZ	Site L&D	2 Hrs	Required	Required	Required	Required	Required	Required
AOZ Module 3: Terrain Dozing	Site L&D	2 Hrs	Optional		Optional	Optional	Optional	Optional
AOZ Module 4: Terrain Loading	Site L&D	2 Hrs	Optional		Optional	Optional	Optional	Optional
AOZ Module 6: Maintenance and Refueling	Site L&D	2 Hrs	Required	Required	Optional	Required	Required	Optional
MineStar Operation								
Sim Lite	Caterpillar	3 days	Optional	Optional	Optional	Optional	Optional	Optional
Command Office Sim School Foundations	Caterpillar	5 days						
Command Office Sim School Intermediate	Caterpillar	5 days						
Fleet Office	Caterpillar	5 days						
Fleet Office Onboard	Site L&D	OJT - AOZ						
Terrain Office (AHS / staffed)	Caterpillar	4 days						
Terrain Onboard	Site L&D	OJT - AOZ						
Pit Technician	Caterpillar	5 days						
Service								
Terrain Service Foundational	Dealer		Required		Optional	Required	Required	Optional
Terrain Service Intermediate	Dealer		Required					Optional
Command Service Foundational	Dealer			Required	Optional	Required	Required	Optional
Command Service Intermediate	Dealer			Required	Optional	Required	Required	Optional

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In-Pit Operations

Course Name:	Delivered by:	Classroom Hrs / Days	Drill & Blast	Wheeled & Track Dozer	Production Loading Tool	Ancillary	AOZ Light Vehicle	Emergency Services
AOZ Onboard								
AOZ Module 1: Introduction	Site L&D	2 Hrs	Required	Required	Required	Required	Required	Required
AOZ Module 2: Operate in AOZ	Site L&D	2 Hrs	Required	Required	Required	Required	Required	Required
AOZ Module 3: Terrain Dozing	Site L&D	2 Hrs		Required				
AOZ Module 4: Terrain Loading	Site L&D	2 Hrs			Required			
AOZ Module 6: Maintenance and Refueling	Site L&D	2 Hrs					Optional	
MineStar Operation								
Sim Lite	Caterpillar	3 days	Optional	Optional	Optional	Optional	Optional	Optional
Command Office Sim School Foundations	Caterpillar	5 days						
Command Office Sim School Intermediate	Caterpillar	5 days						
Fleet Office	Caterpillar	5 days						
Fleet Office Onboard	Site L&D	OJT - AOZ						
Terrain Office (AHS / staffed)	Caterpillar	4 days						
Terrain Onboard	Site L&D	OJT - AOZ	Required	Required	Required			
Pit Technician	Caterpillar	5 days						
Command for Dozing Line of Sight	Caterpillar / Dealer	1 Day		Optional				
Command for Dozing Non-Line of Sight	Caterpillar / Dealer	1 Day		Optional				
Command for Dozing Semi-Autonomous Tractor System (SATS)	Caterpillar	4 Days		Optional				

MINING TECHNOLOGY TRAINING

Caterpillar MineStar Course Outlines

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FLEET TERRAIN DETECT HEALTH COMMAND

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Autonomous Operating Zone Training (AOZ)

PROGRAM OVERVIEW

BENEFITS OF THE AUTONOMOUS OPERATING ZONE (AOZ) TRAINING PROGRAM

+ Ensure your site personnel at all levels understand the safety concepts of working on an Autonomous Mine Site
+ Learning how to drive and operate safely around Autonomous Mining Trucks
+ Learn how the Dozer Operator can take control over their dumping locations by creating their own dump points for floor maintenance and assist in validation of new Dump Plans
+ Learn how your Production Operator can take charge and control their immediate Load Plan area and enhance their production throughput efficiencies
+ Learn how to Mode Change the Autonomous Mining Trucks and work safely in and around Station Plans such as Go Lines, Fuel Bays, Break Down Bays and Transfer Bays
+ Complete the Caterpillar MineStar Qualified Trainer program to further enhance your projects capabilities for training on demand.

TARGETED TRAINING

The AOZ program places a high emphasis on safety controls and production management, and is designed to be a cost-effective training program for the customer to own and manage themselves.
By partnering with the Caterpillar MineStar Training Team, your selected on-site training staff will be taken through an in-depth Train the Trainer course known as the MineStar Qualified Trainer program.
During this program, each authorized trainer will learn how to present each module of the AOZ program, have the opportunity to provide 'teach back' sessions to the Caterpillar Instructor to ensure mastery of the topic and then be trained and assessed on site each practical task associated with those modules.
This in turn empowers you, our partner, in taking control of your own on-site training logistics.

LEARNING EXPERIENCE

All training is supported by eLearning and Instructor Led coaching and mentoring. On completion of the MineStar Qualified Trainer program, the Training staff will then be issued all the required Caterpillar documentation to reformate into your own templates and have the ability to facilitate this training within their own training schedules.

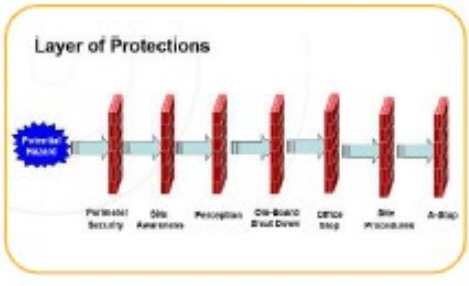
INCLUDED COURSE TOPICS:

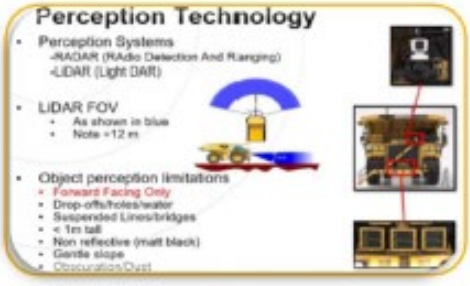
During the 10 days of extensive hands-on Caterpillar instructor-led practical training, learners will:

+ **Receive 'train the trainer' level coaching and mentoring from an authorized Caterpillar subject matter expert**
+ **Have the opportunity to present back to the Caterpillar instructors to underpin their knowledge and determine any knowledge gaps**
+ **All editable training documentation required to facilitate the five (5) AOZ training modules**
+ **Trainees receive mentoring and coaching from an authorized Caterpillar subject matter expert when first delivering this training to their own training groups**

For more information, email us at:

MineStar_Training@cat.com





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Caterpillar Online eLearning

PROGRAM OVERVIEW

BENEFITS OF THE CATERPILLAR ELEARNING TRAINING PROGRAM

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
- boost efficiency

That's why the MineStar team provides a comprehensive suite of training opportunities that allows users to build and enhance their skills from the comfort of their own office or home.

TARGETED TRAINING

MineStar Training is made up of multiple individual courses. The courses contain the high-level objectives, goals and system information to ensure your staff are equipped with the knowledge they require.

The eLearning course modules are organized by Product:

- Fleet
- Command
- Terrain
- Detect
- Health

LEARNING EXPERIENCE

Once you decide on which course offering you would like to take, simply self enroll or contact the MineStar Training team for advice and assistance.
All eLearning modules are cross platform compatible so you can even learn while travelling on the train to your office via your mobile phone.

INCLUDED COURSE TOPICS:

All eLearning training is optional for self-enrolment or will be assigned as part of any Instructor Led Training program scheduled by your Caterpillar Training Department partners, learners will:

- **Have the ability for continuous review of new and previously completed course modules**
- **Have the ability to download certificates of completion as evidence of training completed**
- **Have unlimited access to all Caterpillar eLearning course material (subscription status required)**

For more information, email us at:

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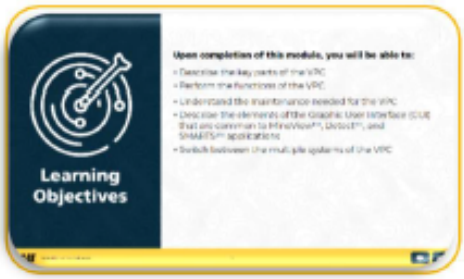

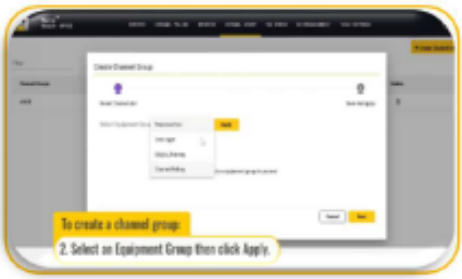

CAT MINESTAR

Command for Hauling SIM Lite

PROGRAM OVERVIEW

BENEFITS OF THE CATERPILLAR COMMAND FOR HAULING SIM LITE TRAINING PROGRAM

The MineStar Command for Hauling SIM Lite program provides the learner with a foundational understanding of the following areas:

- Introduction to MineStar Office Client
- Command for Hauling Safety Concepts including Layers of Protection
- Adopting autonomy within the overall mine site
- Basic components of a Mine Model
- Introduction to Fleet Management with MineStar

TARGETED TRAINING

This training course is designed for those individuals who are already involved with autonomous operations, particularly in supporting roles, or who will be supporting the deployment of autonomy at their mine site.

LEARNING EXPERIENCE

- Day 1 – Introduction to MineStar and autonomy
- Day 2 – Mine Model basics
- Day 3 – Introduction to Fleet Management

Trainees will be given an overview of core MineStar Command for Hauling features and benefits. They will have the opportunity to complete hands-on exercises with guidance from an instructor, including the construction of different aspects of a virtual mine model and managing a fleet of autonomous trucks.

INCLUDED COURSE TOPICS:

During the 3 days of Caterpillar instructor-led training, learners will cover:

- **Introduction to the MineStar system**
- **Command for Hauling safety systems**
- **Foundational Mine model building**
- **Managing autonomous trucks**

For more information, email us at:

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CATERPILLAR MINESTAR PRODUCTION MONITORING PROGRAM (SURFACE)

PROGRAM OVERVIEW

BENEFITS OF THE CATERPILLAR MINESTAR PRODUCTION MONITORING (Surface) TRAINING PROGRAM

The Caterpillar MineStar Production Monitoring Program (Surface) promotes education and familiarization to aid leaders in monitoring and auditing production key performance indicators, utilizing MineStar system tools to trigger and act upon production and process inefficiencies.

TARGETED TRAINING

This course was designed specifically for those in leadership roles, focusing on a high-level overview of the tools needed to monitor efficient operations of the MineStar system. Key topics include:

- Optimized assignment visualization
- Optimized page configurations to highlight and troubleshoot production issues
- Proactive system monitoring and auditing
- Efficiency improvement
- Auditing Visualization

LEARNING EXPERIENCE

Core to the MineStar Leader Program is understanding:

- Goal validation
- Assignment logic
- Trucking indication
- Correct mine model management
- Monitoring of operational performance

ADDITIONAL APPLICATIONS

- Enhance staff understanding
- Refresh skills for previously trained personnel

INCLUDED COURSE TOPICS:

During the 2 days of extensive hands-on Caterpillar instructor-led practical training, learners will:

+ **Focus to highlight pages within MineStar to aid in auditing and monitoring the mine model for areas of possible process and efficiency improvements.**
+ **Understand how to identify speed and traction restrictions.**
+ **Manage the virtual mine model.**
+ **Monitor Fleet efficiencies.**
+ **Understand how to monitor in real time, fleet efficiencies against production KPI's.**
+ **Utilizing CAT web pages.**

CAT MINESTAR

Command Pit Technician Program

PROGRAM OVERVIEW

BENEFITS OF THE MINESTAR COMMAND PIT TECHNICIAN PROGRAM

The MineStar Command Pit Technician program promotes job efficiency by:

- Understanding in-field best practices
- Real world versus virtual world mine inspections & auditing
- Understanding key principals of mine model building
- Production throughput efficiency improvements
- Providing the skills and understanding required for Pit Technicians, Mine Supervisors and Mine Planners

TARGETED TRAINING

This course was designed specifically for those in the Command Pit Technician role, focusing on developing the skills needed to maintain efficient operations of the MineStar system. Key topics include:

- Principles of proactive onsite monitoring
- Developing the foundational skills required to assist in building components of the virtual mine model
- Developing a higher level of understanding of fleet efficiencies at dump locations
- Using real-world examples of possible situations the Pit Technician may find themselves in and how to manage these situations to ensure production is maintained

LEARNING EXPERIENCE

Core to the Command Pit Technician training program is learning to understand the importance of productivity efficiencies and material throughput.
All training is conducted in a safe virtual simulated environment requiring the trainee candidate to create an evidence portfolio that demonstrates their understanding and capability in working within the MineStar Client.

INCLUDED COURSE TOPICS:

During the 5 days of extensive hands-on Caterpillar instructor-led practical training, learners will:

- **Learning the fundamentals of Fleet Office and Command for Hauling Office systems**
- **Learning the importance of mine modelling and building principals to ensure safe and efficient operations**
- **Planning, preparing and validating new work locations on site**
- **Assessing equipment recoveries**
- **Learning the importance of safe working procedures in and around Station Plans**

For more information, email us at:
MineStar_Training@cat.com

CAT MINESTAR

Fleet Office

PROGRAM OVERVIEW

BENEFITS OF THE FLEET CONTROLLER TRAINING PROGRAM

The MineStar Controller program provides the trainee an in-depth overview of system navigation, functionality, and usability of MineStar Fleet Office.

This course provides insight into:

+ Monitoring production equipment and control process for repositioning machines to another destination.
+ Minimizing operational costs. Utilizing automation processes for refuelling and TKPH management.
+ The Material Tracking component of MineStar Office
+ Managing machine availability and assignability, restrictions, loading tool preferences, queue tolerance and scheduling assignments.
+ Time Usage Model. Delay and Cycle data. Managing and correcting data integrity issues.
+ The assignment algorithm, assignment context, efficiencies and restraints.

TARGETED TRAINING

This course was designed specifically for those in or entering positions of fleet management, production monitoring and end users utilizing the MineStar Fleet Office software. This course covers specific pages, settings and configurations for executing Production Plans and responding to operational mining needs.

LEARNING EXPERIENCE

Trainees put Controlling into context and build a baseline of knowledge by utilizing a Production Plan and Controller Checklist along with the simulated Mine Model. Trainees experience hands-on troubleshooting scenarios and exercises to better equip for pressure situations.
By learning, practicing, repeating tasks, self-diagnosing areas of improvement and using best practices in a safe simulated environment, trainees are better prepared for daily operation and KPI's.

INCLUDED COURSE TOPICS:

During the 5 days of extensive hands-on Caterpillar instructor-led practical training, learners will:

+ **Demonstrate creating, validating, and maintaining a Spatial Mine Model .**
+ **Develop assignment engine logic. Including types of assignments, assignment considerations, restrictions, and components which impact assignments.**
+ **Identify and troubleshoot failed assignments.**
+ **Manage historical, current, and future delays as well as data integrity issues.**
+ **Describe the importance and impacts of cycle data. Monitor cycle activities and resolve common cycle issues.**

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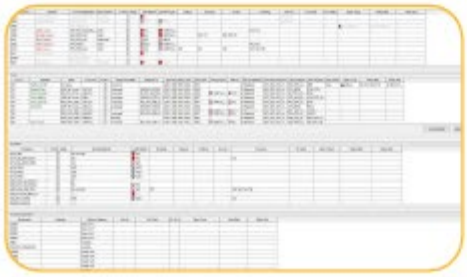

PROGRAM OVERVIEW

BENEFITS OF THE CATERPILLAR COMMAND FOR HAULING TRAINING PROGRAM

The MineStar Command for Hauling program provides the learner with best practices and processes and offers an in-depth overview in the following areas:

- Introduction to MineStar Office Client
- Command for Hauling Safety Concepts including Layers of Protection
- Maintaining an Accurate Surface File
- Foundational to Intermediate Mine Model Building
- Throughput Efficiencies
- Introduction to Fleet Management
- Use of production plans and ensuring that daily targets and goals are achieved

TARGETED TRAINING

This training course is designed for those individuals who are currently working with the MineStar Office system or who are looking at taking that next step in advancing into a Controller, Builder or Application Specialist job role. The content has been created in a way to allow the learner to easily absorb the new information so they can transfer that knowledge into the workplace.

LEARNING EXPERIENCE

- Week 1 – MineStar Office functionalities & foundational mine model building
- Week 2 – Intermediate mine model building
- Week 3 – Builder/Controller team week

Trainees are to build out a fully functional mine model using the latest technology with our training simulators and will use real life scenarios within in the training room. This unique opportunity allows the learners to start with the Command for Hauling fundamentals and work through to achieve that intermediate level benchmark which also includes the last week being Controller/Builder week, in which the learners will be given a production plan each day that they must follow to achieve daily targets and goals.

INCLUDED COURSE TOPICS:

During the 15 days of extensive hands-on Caterpillar instructor-led practical training, learners will cover:

- **Introduction to the MineStar system**
- **Command for Hauling safety systems**
- **Mine model building, maintenance and validation, including surface management**
- **Troubleshooting and fault finding within the mine model**
- **Executing and maintaining a daily production plan achieving the daily requirements**

For more information, email us at:

MineStar_Training@cat.com

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TERRAIN OFFICE FOR GRADING & LOADING

PROGRAM OVERVIEW

BENEFITS OF THE TERRAIN OFFICE FOR GRADING & LOADING TRAINING PROGRAM

The purpose of this course is to introduce users to Terrain Office for Grading & Loading Operations. It discusses the advantages and benefits of using Terrain, explores the many functions and features, investigates the different applications that are used in conjunction with it, and highlights the important system components that make it work.

TARGETED TRAINING

This course was designed specifically for those in production / fleet management and end user roles, or those primarily responsible for Terrain Grading & Loading file creation and management.

Key topics include:

- Terrain Office for Grading & Loading knowledge and usability
- Terrain Office overview and requirements
- Insight into the many functions and features found within Terrain Office and dependent applications
- End user system inputs and Functionalities

LEARNING EXPERIENCE

Core to the learning experience are the following aspects of training:

- Hands-on application of core Terrain Office functionalities
- Ability to identify, create, and navigate entities within Terrain Office and Onboard
- Explore end user inputs and functionalities
- Safe learning environment with no impact to production

INCLUDED COURSE TOPICS:

During the 4 days of extensive hands-on Caterpillar instructor-led practical training, learners will:

+ **Focus on highlighting core user interfaces of the Terrain Office for Grading and Loading solution, for the development of skills to navigate and utilize Terrain to perform tasks and manage performance to design.**
+ **Identify and navigate the components of the Terrain User Interface.**
+ **Explore and utilize Machine Configuration Utility (MCU).**
+ **Create and explore Terrain Machines and Onboard Lists.**
+ **Create and explore Material, Elevation, Display, and Avoidance file functionality.**
+ **Explore As-build and AOSM files.**
+ **Create and explore Bounding Regions, Groups, and Projects**

For more information, email us at:

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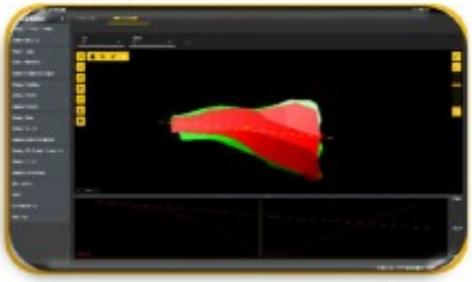

CAT MINESTAR

MineStar Controller User Interface

PROGRAM OVERVIEW

BENEFITS OF THE MINESTAR CONTROLLER USER INTERFACE PROGRAM

The MineStar Controller User Interface program provides the trainee an in-depth overview of the system panels and functionality of the user interface.

+ Focusing on where new endpoints are managed from the single location
+ Reducing task loading for the Controller
+ Breaking down the unknowns of learning the new platform
+ Refining production assignment working towards maintaining required KPI's
+ Track production, monitor onsite equipment and manage site operations from the intuitive one touch environment

TARGETED TRAINING

The MineStar Controller User Interface Program tests and reinforces knowledge gained from combining the candidates former Sim School training and current on the job practical experience.

This program is built specifically around the Controllers' job role focusing on the Controller integrations with all training is targeted to prepare learners for the role they will be filling on site.

After completing a full review of the user interface, the trainees will be required to work individually on designated production plans where they must be able to meet hourly production and task target KPI's.

Where task target KPI's are not being met, the trainee must be able to correctly identify the reasonings behind the result and provide recommendations on what would be required to do next time to achieve the expected outcomes.

LEARNING EXPERIENCE

Trainees are required to work towards achieving production task targets, scheduled assignments and manage delays based on the provided Day 1 and Day 2 production plans using the MineStar Controller User Interface Simulator.
By learning, practicing, repeating tasks, self-diagnosing areas of improvement and using best practices in a safe simulated environment, learners are better prepared to adopt and fully integrate the user interface into daily operations.

INCLUDED COURSE TOPICS:

During the 2 days of extensive hands-on Caterpillar instructor-led practical training, learners will:

+ **Learn how to input a production plan into the MineStar Controller User Interface for day-to-day task targets.**
+ **Plan, prepare and validate information driven from controller checklists.**
+ **Learn production requirements inputs converting from goals to tasks.**
+ **Assess data inputs and outcomes from the assignment engine against system productivity.**
+ **Practice generalized responses to emergency situations.**
+ **Troubleshoot instructor-initiated faults.**
+ **Learn the new practices of calling and sending trucks in and around Stations.**
+ **Learn where to look to determine autonomous haul truck faults.**

For more information, email us at:

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CAT MINESTAR

Fleet Controller

PROGRAM OVERVIEW

BENEFITS OF THE FLEET CONTROLLER TRAINING PROGRAM

The MineStar Controller program provides the trainee an in-depth overview of system navigation, functionality, and usability of MineStar Fleet Office.

This course provides insight into:

+ Monitoring production equipment and control process for repositioning machines to another destination.
+ Minimizing operational costs. Utilizing automation processes for refuelling and TKPH management.
+ The Material Tracking component of MineStar Office
+ Managing machine availability and assignability, restrictions, loading tool preferences, queue tolerance and scheduling assignments.
+ Time Usage Model. Delay and Cycle data. Managing and correcting data integrity issues.
+ The assignment algorithm, assignment context, efficiencies and restraints.

TARGETED TRAINING

This course was designed specifically for those in or entering positions of fleet management, production monitoring and end users utilizing the MineStar Fleet Office software. This course covers specific pages, settings and configurations for executing Production Plans and responding to operational mining needs.

LEARNING EXPERIENCE

Trainees put Controlling into context and build a baseline of knowledge by utilizing a Production Plan and Controller Checklist along with the simulated Mine Model. Trainees experience hands-on troubleshooting scenarios and exercises to better equip for pressure situations.
By learning, practicing, repeating tasks, self-diagnosing areas of improvement and using best practices in a safe simulated environment, trainees are better prepared for daily operation and KPI's.

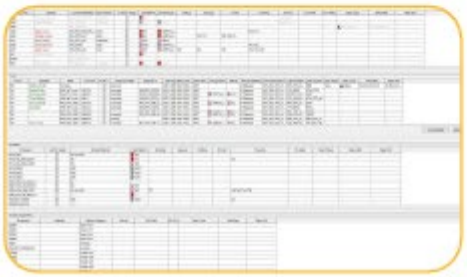
INCLUDED COURSE TOPICS:

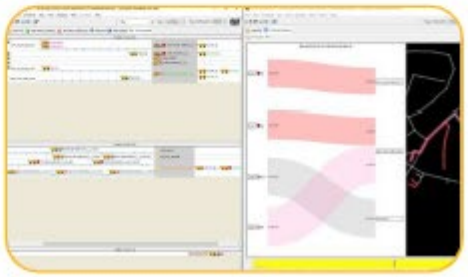
During the 5 days of extensive hands-on Caterpillar instructor-led practical training, learners will:

+ **Demonstrate creating, validating, and maintaining a Spatial Mine Model .**
+ **Develop assignment engine logic. Including types of assignments, assignment considerations, restrictions, and components which impact assignments.**
+ **Identify and troubleshoot failed assignments.**
+ **Manage historical, current, and future delays as well as data integrity issues.**
+ **Describe the importance and impacts of cycle data. Monitor cycle activities and resolve common cycle issues.**

For more information, email us at:

MineStar_Training@cat.com





CAT MINESTAR

FLEET OFFICE BUILDER

PROGRAM OVERVIEW

BENEFITS OF THE FLEET OFFICE BUILDER TRAINING PROGRAM

The Fleet Office Builder course enables key production personnel to support the site production objectives by discussing best practices and processes in the following areas:

+ MineStar Office modeling use cases, including main aspects of validation and surface management
+ Monitoring of the core operational performance indicators
+ Operator licensing, including management of the personnel records and pre-start machine inspection checklists
+ Mining block workflow and troubleshooting of the common production failure modes
+ Introduction to the core aspects of the system architecture, administration and configuration

TARGETED TRAINING

This course is designed for the Intermediate to Advanced level users of the MineStar Office system, with prior exposure to the Controller, Builder or Application Specialist job roles. The content is focused on enhancing and refreshing the skills needed to achieve conformance to the daily production plan by utilizing the mine model maintenance and validation best practices.

LEARNING EXPERIENCE

Core to the learning experience are the following aspects of training:

+ Practical application of the core MineStar Office modeling best practices and validation methodologies
+ Illustration of the key concepts with common failure modes in the mining production environments
+ Baselining of the system administration and configuration skillset to enable effective liaison between the production and support stakeholders

INCLUDED COURSE TOPICS:

During the 5 days of extensive hands-on Caterpillar instructor-led practical training, learners will cover:

+ **Mine model maintenance and validation, including surface management**
+ **Personnel and system user management, including operator licensing**
+ **Mining block workflow and troubleshooting**
+ **Introduction to the MineStar system architecture and administration**
+ **Spatial mine model and Assignment Planner configuration options**

For more information, email us at:

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CAT MINESTAR

ASSIGNMENT PLANNER AND PRODUCTION CIRCUITS

PROGRAM OVERVIEW

BENEFITS OF THE ASSIGNMENT PLANNER TRAINING PROGRAM

The Assignment Planner and Production Circuits course discusses the relevant tools, methodologies and best practices which enable customers to achieve their site production objectives.

Participants explore the Builder, Controller and Specialist perspectives through a series of practical scenarios within a simulated MineStar environment.

The course includes common troubleshooting use cases and provides an overview of the Assignment Planner phased implementation strategy.

TARGETED TRAINING

This course is designed for the Intermediate to Advanced level users of the MineStar Office system, with prior exposure to the Controller, Builder or Application Specialist job roles.

The content is focused on enhancing and refreshing the skills needed to achieve conformance to the daily plan requirements while lowering the operating costs.

LEARNING EXPERIENCE

Core to the Assignment Planner and Production Circuits training experience is:

+ Overview of the key Assignment Planner terms, architecture, and logic
+ Description of the core mine model maintenance tasks to enable efficient operation of the truck assignment algorithm
+ Discussion of the common tools and methodologies used during execution of the Plan-Do-Check-Act control process
+ Overview of the main Assignment Planner and MineStar Office configuration settings to improve efficiency of the system
+ Summary of the troubleshooting tools and methodologies in the context of the common production challenges

Practical exploration of the various scenarios in a MineStar Office simulated environment enables the learners to apply the concepts to own procedures and site best practices.

INCLUDED COURSE TOPICS:

During the 2 days of extensive hands-on Caterpillar instructor-led practical training, learners will cover:

+ **New features and improvements in Assignment Planner and Production Circuits**
+ **Assignment Planner Hierarchy and logic for haulage prioritization**
+ **Mine model maintenance requirements for site Builders**
+ **Control tools and methodologies, including troubleshooting of common Assignment use cases**
+ **Best practices for machine priorities and production goals**
+ **Core Assignment Planner configuration options and the phased implementation process**

For more information, email us at:

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CAT MINESTAR

MINESTAR SYSTEM ADMINISTRATION AND TROUBLESHOOTING

PROGRAM OVERVIEW

BENEFITS OF THE MINESTAR SYSTEM ADMINISTRATION TRAINING PROGRAM

The MineStar System Administration and Troubleshooting program enhances expertise of the key technology support staff by discussing best practices and processes in the following areas:

+ MineStar system architecture and infrastructure components, including design patterns for effective change management in Fleet and Command
+ Core tools and methodologies for troubleshooting of system stability and performance incidents
+ System restoration best practices and validation methodologies after restart
+ Core network communication patterns, including Failure Mode Effects Analysis and common troubleshooting methodologies

TARGETED TRAINING

This course is designed for the MineStar Office users who specialize in the system administration, support and troubleshooting tasks. The content is focused on enhancing the skills needed to effectively contribute to the site production objectives by maximizing application availability and performance.

LEARNING EXPERIENCE

Core to the learning experience are the following aspects of training:

+ Hands-on deployment of the MineStar Office training environment with an SQL Server database instance
+ Baselining of the System Administrator's skillset using checklists, procedures and guidelines
+ Illustration of concepts with common failure modes in mining production environments
+ Overview of the production context, support platforms and procedures, additional sources of information, and documentation

INCLUDED COURSE TOPICS:

During the 5 days of extensive hands-on Caterpillar instructor-led practical training, learners will cover:

+ **MineStar system architecture and core infrastructure components**
+ **Proactive system monitoring guidelines and best practices**
+ **System restoration and validation prior to handover to production**
+ **Network communication patterns and core troubleshooting methodologies**
+ **System log review process and performance visualization toolbox**

For more information, email us at:

MineStar_Training@cat.com

CAT MINESTAR

Command for Dozing Line of Sight (LOS)

PROGRAM OVERVIEW

BENEFITS OF THE CATERPILLAR COMMAND FOR DOZING LINE OF SIGHT TRAINING PROGRAM

The MineStar Command Line of Sight Dozing (LOS) program promotes safety & job efficiency by:

- Identifying all safety aspects of the Line of Sight technology
- Understanding & recognizing in-field dozing best practices
- Production throughput efficiency improvements
- Providing the skills and understanding required for Line of Sight Dozing

TARGETED TRAINING

This training course is designed for personnel with previous track dozing experience. The objective is to bring the trainees existing dozer skills, and to be able to execute those skills needed to maintain efficient operations using the MineStar Command Line of Sight technology. Key topics covered include:

- Overview of the Command for Dozing Technology
- Command for Dozing Safety Concepts
- Machine Components
- Operator Station Features & Functionalities
- Start-up, Operation & Shutdown Practices
- Basic Troubleshooting & Fault Finding

LEARNING EXPERIENCE

Training is conducted in a controlled environment within the workplace to maximise a real-life training experience. Each learner will be given specific tasks in which they will need to complete and will consider safety, operational best practices, and efficiency. Each learner will be assessed on their performance which will prepare the learner to fully integrate the Line of Sight technology into their daily operations.

INCLUDED COURSE TOPICS:

During the 1 day of extensive hands-on Caterpillar instructor-led practical training, learners will:

- **Have unlimited access to eLearning training modules the learner can utilize for continuous review and refresher training**
- **Complete classroom-based training to learn the fundamentals of the Command for Dozing Technology and safety concepts**
- **Extensive infield practical 1on1 training with a Caterpillar certified trainer familiarising with the Line of Sight Operator Console and completing set tasks using best practices**
- **Practical assessment and Summary given on each of the individuals performance**

For more information, email us at:

MineStar_Training@cat.com

CAT MINESTAR

Command for Dozing Non-Line of Sight (NLOS)

PROGRAM OVERVIEW

BENEFITS OF THE CATERPILLAR COMMAND FOR DOZING NON-LINE OF SIGHT TRAINING PROGRAM

The MineStar Command Non-Line of Sight Dozing (NLOS) program promotes safety & job efficiency by:

- Identifying all safety aspects of the Non-Line of Sight technology
- Understanding & recognizing in-field dozing best practices
- Production throughput efficiency improvements
- Providing the skills and understanding required for Non-Line of Sight Dozing

TARGETED TRAINING

This training course is designed for personnel with previous track dozing experience. The objective is to bring the trainees existing dozer skills, and to be able to execute those skills needed to maintain efficient operations using the MineStar Command Non-Line of Sight technology. Key topics covered include:

- Overview of the Command for Dozing Technology
- Command for Dozing Safety Concepts
- Machine Components
- Operator Station Features & Functionalities
- Start-up, Operation & Shutdown Practices
- Basic Troubleshooting & Fault Finding

LEARNING EXPERIENCE

Training is conducted in a controlled environment within the workplace to maximise a real-life training experience. Each learner will be given specific tasks in which they will need to complete and will consider safety, operational best practices, and efficiency. Each learner will be assessed on their performance which will prepare the learner to fully integrate the Non-Line of Sight technology into their daily operations.

INCLUDED COURSE TOPICS:

During the 1 day of extensive hands-on Caterpillar instructor-led practical training, learners will:

- **Have unlimited access to eLearning training modules the learner can utilize for continuous review and refresher training**
- **Complete classroom-based training to learn the fundamentals of the Command for Dozing Technology and safety concepts**
- **Extensive infield practical 1on1 training with a Caterpillar certified trainer familiarising with the Non-Line of Sight Operator Console and completing set tasks using best practices**
- **Practical assessment and Summary given on each of the individuals performance**

For more information, email us at:

MineStar_Training@cat.com

CAT MINESTAR

Command for Dozing Semi-Autonomous Tractor System (SATS)

PROGRAM OVERVIEW

BENEFITS OF THE CATERPILLAR COMMAND FOR DOZING Semi-Autonomous Tractor System (SATS) TRAINING PROGRAM

The MineStar Command Dozing (SATS) program promotes safety & job efficiency by:

- Identifying all safety aspects of the Non-Line of Sight technology
- Remote operation of multiple dozers
- High utilization & reduce costs, 1 operator / up to 4 machines
- Providing the skills and understanding required for SATS machine management

TARGETED TRAINING

This training course is designed for personnel with previous track dozing experience. The objective is to bring the trainees existing dozer skills, and to be able to execute those skills needed to maintain efficient operations using the MineStar Command SATS technology. Key topics covered include:

- Overview of the Command for Dozing Technology
- Command for Dozing Safety Concepts
- Machine Components along with Office Components
- Operator Station Features Along with Office Features
- Work Block and Slot design setup, Operation & Shutdown Practices
- Basic Troubleshooting & Fault Finding

LEARNING EXPERIENCE

Training is conducted in a controlled environment within the workplace to maximise a real-life training experience. Each learner will be given specific tasks in which they will need to complete and will consider safety, operational best practices, and efficiency. Each learner will be assessed on their performance which will prepare the learner to fully integrate the SATS and Multi Machine technology into their daily operations.

INCLUDED COURSE TOPICS:

During the 4 day of extensive hands-on Caterpillar instructor-led practical training, learners will:

- **Have unlimited access to eLearning training modules the learner can utilize for continuous review and refresher training**
- **Complete classroom-based training to learn the fundamentals of the SATS Multi Machine Technology and safety concepts**
- **Extensive infield practical 1on1 training with a Caterpillar certified trainer familiarizing with SATS Work Block ,Slot design and Multi Machine Management**
- **Practical assessment and Summary given on each of the individuals performance**

For more information, email us at:

MineStar_Training@cat.com