Rigging Training Standard

RTS

October 2024

NATE: The Communications Infrastructure Contractors Association

NOTICE

NATE is a non-profit organization dedicated to facilitating safety, education and standards for the tower erection, service, and maintenance industry. The *NATE Rigging Training Standard* was developed to bring consistency to material rigging training in the communication industry by establishing the minimum standards to which all technicians should be trained.

By using this standard, you hereby acknowledge that you are solely responsible for the development of your program and training of individuals in your company. Furthermore, NATE notifies you that you are responsible for knowing and following applicable regulations and laws pertaining to tower safety and training, and it is your responsibility to defend your training program if it is ever questioned or challenged by outside sources, including any federal or state regulatory agencies responsible for occupational safety and health.

NATE accepts no responsibility for the training that will be conducted under this standard, and use of this standard is at your own risk. This standard should not be construed as legal advice or a legal opinion on any specific facts or circumstances, or as creating any warranties, or legal obligations, either expressed or implied.

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NATE Rigging Training Standard

INTRODUCTION

The *NATE Rigging Training Standard (RTS)* establishes a minimum baseline of knowledge and skills needed for employees performing material rigging operations on antenna supporting structures. The RTS offers support to an employer's development and maintenance of its Rigging Training Program to comply with the ANSI/ASSP A10.48-2023 standard.

Terminology definitions utilized in the RTS are consistent with definitions provided within the ANSI/ASSP A10.48-2023. Trainers shall have access to and utilize the ANSI/ASSP A10.48-2023 standard during training.

Employers and program administrators shall follow OSHA's hierarchy or preferred order of controls regarding rigging hazards, including:

a. Elimination of the hazard

b. Implementation of rigging configuration, systems, and equipment to mitigate the hazard

c. Administrative or work practice control

SCOPE

The RTS applies to employees performing rigging operations involving hoisting and material handling on antenna supporting structures to include installation, maintenance, modification, and/or demolition operations.

Information contained in the RTS was obtained from available sources and represents the accepted industry minimum standard for criteria related to rigging on antenna supporting structures.

EXCEPTIONS

The RTS does not address hoisting and material handling operations involving:

a. Gin poles

b. External lifting devices (e.g. cranes, helicopters, MEWP's)

c. Operator training for capstan hoists

d. Operator training for base-mounted hoist

e. Rigging for rescue or rope access

It shall be acceptable for the practical skills demonstration to incorporate only the rigging components being utilized by students in the field.

Completion of training according to the RTS does not certify an employee as authorized, competent, or qualified. The employer is responsible for ensuring the employee training is applicable to project-specific scopes of work and for deeming individuals as authorized, competent, or qualified based upon:

a. Performance on RTS training topic evaluations (see Section 5)

b. Demonstrated proficiency of rigging operations

c. Experience performing rigging operations

TRAINING REQUIREMENTS

General

An employer's rigging training program shall be developed and maintained in accordance with the ANSI/ASSP A10.48-2023, Section 14, including the following requirements:

a. Training shall be provided to all employees engaged in rigging operations.

b. Training shall be provided in a language understood by the employee.

c. Training shall be delivered in the form of:

    1. Classroom presentations or e-learning

    2. Practical demonstrations, inclusive of on-the-job training

d. Time shall be provided for training based on factors such as:

    1. The number of employees/students

    2. The number of trainers

    3. The training site size and available equipment

    4. Potential work environment(s) of the employees/students

RTS Certificate of Training

After evaluating the performance standard section of each training topic, students shall be given a certificate of training completion. The certificate shall include the minimum of:

a. Student name

b. Title of training course

c. Date of successful completion of training

d. Statement indicating the student has successfully completed training

e. Company name of the training provider

f. Signature of the trainer or training provider

Prior to issuing a certificate of course completion, a qualified person designated by the employer shall evaluate each student.

The evaluation shall include a demonstration of competency from each topic and include a written exam.

Evaluation of employee/student performance shall be documented.

Re-Training

Re-training may be required when:

a. Services provided by the employer change (e.g., line and antenna work, tower modifications, gin pole operations, etc.)

b. The nature of the work, or the methods of control or rigging complexity change to an extent that prior training is not adequate

c. An employee demonstrates a lack of understanding and/or the inability to perform a certain skill for the intended scope of work

d. There is a revision in the RTS, consensus standards, regulations, or company policies impacting previous training received

Documentation Records

The employer shall maintain documentation in accordance with ANSI/ASSP A10.48-2023, Section 14.3.1, to include the following:

a. Course syllabus, including content and activities that students perform during training.

b. The name of the training provider, the course, the training dates, and daily attendance.

c. Results from evaluations.

d. Certificates of training.

Training and Evaluation Environment

a. Equipment, training techniques, demonstrations, and procedures used during training shall adhere to applicable federal, state, and local laws, standards, and regulations.

b. The learning environment shall be representative of the workplace environment for antenna supporting structures.

c. Rigging systems and equipment used shall be representative of the equipment and configurations that the student will use during work.

d. Access to manufacturer instructions shall be available.

Training Topic Organization and Purpose

Each training topic within the RTS consists of the following categories:

a. Objectives

Objectives are used in the RTS to provide learning goals for students. The methodology of achieving these goals will vary based on previous education, student experience, and various teaching methods.

b. Learning Conditions and Considerations

Learning Conditions and Considerations are used in the RTS to provide training content and requirements for each training topic. The listed conditions are minimum requirements to ensure consistency in training and maximize student understanding and retention. Trainers are encouraged to use additional exercises, presentations, handouts, videos, case studies, equipment brochures, instructions, and equipment to supplement the provided learning conditions.

c. Performance Standards

Performance standards are used in the RTS as the minimum required activities that students must demonstrate to the trainer during a training topic's evaluation.

Training Topic Outline

Part 1: General Training

1.1 INTRODUCTION

Learning Objective

Introduce program objectives and complete training roster.

Learning Conditions and Considerations

Climbers shall be provided:

a. Sign-in sheet

b. Trainer and climber introductions

c. Training materials and schedule

d. Description of what is expected of the student

e. Encouragement to ask questions throughout the training

Performance Standard

Students shall:

a. Sign-in

b. Engage in training

c. Ask questions as necessary

1.2 POLICIES, STANDARDS, AND REGULATIONS

Learning Objective

Knowledge of employer's rigging policies, applicable standards and regulations.

Learning Conditions and Considerations

Students shall be educated on the following but not limited to:

a. Employer's rigging policies, including roles and responsibilities of personnel

b. OSHA 1926 along with any other applicable rigging regulations

c. ANSI/ASSP A10.48-2023, ANSI/TIA 322-A, and ASME B30 series

Performance Standard

Students shall demonstrate knowledge of employer's rigging policies, applicable standards and regulations.

1.3 COMMUNICATION STRUCTURES

Learning Objective

Identify structure types, rigging hazards, and inspection requirements within context of scope of work and construction plans.

Learning Conditions and Considerations

Students shall be educated on the following but not limited to:

a. Structure types, examples, and characteristics

b. Examples of rigging hazards including mitigation and control measures

c. Pre-construction and onsite inspection procedures

Performance Standard

Students shall demonstrate knowledge of:

a. Structure types and characteristics

b. Rigging hazards including mitigation and control measures

c. Pre-construction and onsite inspection procedures

Part 2: Construction Plans

2.1 IDENTIFICATION

Learning Objective

To identify minimum construction plan classification requirements.

Learning Conditions and Considerations

Students shall be provided information for determining the minimum construction plan classification based upon:

a. Scope of Work (SOW) including potential impacts to strength and stability of the structure and foundation

b. Gross lift weights

c. Hoisting system(s) utilized (e.g. rigging attached to structure versus external devices such cranes, MEWP's, helicopters, etc.)

d. Construction procedures including:

    1. Selection of rigging attachment points (e.g., monopole shaft or panel points on lattice towers)

    2. Construction sequencing and duration

    3. Infrequent process or means and methods

Performance Standard

Students shall demonstrate knowledge to determine construction plan classifications.

2.2 STAKEHOLDERS

Learning Objective

To identify the minimum required stakeholders, including individual roles and responsibilities, for each construction plan classification.

Learning Conditions and Considerations

Students shall be educated in determining the minimum required stakeholders including individual roles and responsibilities in accordance with ANSI/ASSP A10.48:

a. Competent Rigger

b. Qualified Person

c. Engineer of Record (EOR)

d. Qualified Engineer

e. Supervising Engineer

f. Owner/Client

Performance Standard

Students shall demonstrate knowledge of minimum required stakeholders, including individual roles and responsibilities, for each construction plan classification.

2.3 OPERATIONAL AND NON-OPERATIONAL CONSTRUCTION LOADS

Learning Objective

To identify operational versus non-operational construction loads per the ANSI/ASSP A10.48-2023.

Learning Conditions and Considerations

Students shall be provided information on:

a. Operational construction loads including applicable wind speed measurement and limitations (i.e. 30 mph unless otherwise specified in the construction plan)

b. Non-operational construction loads including applicable wind speed measurement and limitations (i.e. 50 mph unless otherwise specified in the construction plan)

c. Other special considerations requiring the engagement of a Qualified Engineer. (i.e. ice, snow and seismic.)

Performance Standard

Students shall demonstrate knowledge of operational and non-operational construction loads, ice and/or wind speed measurements, and wind speed limitations.

Part 3: Equipment – Selection, Use and Maintenance

3.1 RIGGING HARDWARE

Learning Objective

To identify the intended use and application, working load limit, safety factor, inspection, and maintenance requirements of rigging hardware in accordance with the ASME B30 standards.

Learning Conditions and Considerations

Students shall be provided with information on rigging hardware including intended use, application, working load limit, safety factor, inspection, and maintenance requirements for the following components including, but not limited to:

a. Shackles

b. Slings

c. Hooks

d. Lever hoists

e. Blocks

f. Eye bolts (shouldered and non-shouldered)

g. Master links

h. Any applicable non-standard components

Performance Standard

Students shall demonstrate knowledge and practical skills demonstration (see Section 5.3) of the application, working load limit, safety factor, inspection, and maintenance requirements of rigging hardware in accordance with the ASME B30 standards.

3.2 SYNTHETIC ROPE

Learning Objective

To identify the application, selection, working load limit, safety factor, inspection, and maintenance requirements of synthetic rope used for load, tag, and control lines in accordance with the ANSI/ASSP A10.48-2023 and ASME B30.30 standards.

Learning Conditions and Considerations

Students shall be provided information on synthetic rope (e.g. 3 strand, kernmantle, double braid, etc.):

a. Characteristics, including, but not limited to:

   1. Construction
   2. Materials
   3. Diameter
   4. Minimum Breaking Strength (MBS)

b. Selection and compatibility considerations

   1. Determination of WLL incorporating end termination and wrap efficiencies (i.e. D/d ratio)
   2. Approximate reduction of overall strength of rope systems from knots.

c. Documented rope log (i.e. identification, manufactured date, in service date, etc.)

d. Inspection, care, and maintenance criteria

e. Typical end terminations including, but not limited to:

   1. Knots
   2. Factory terminations

f. Use of friction hitches (e.g. prusik, munter)

g. Considerations for use of rope protection including, but not limited to:

   1. Thimbles
   2. Sleeves
   3. Rollers

h. Appropriate use and implementation of knots and hitches

i. Overhaul weight considerations (i.e. have sufficient weight to overhaul the weight of the line while accounting for friction and other rigging considerations.)

Performance Standard

Students shall demonstrate knowledge and practical skill (see Section 5.3) of the application, design/safety factor, inspection, and maintenance requirements of synthetic rope used for load, tag, and control lines in accordance with the ANSI/ASSP A10.48-2023 and ASME B30.30 standards.

3.3 WIRE ROPE

Learning Objective

To identify the application, selection, working load limit, safety factor, inspection, and maintenance requirements of wire rope used for load, tag, and control lines in accordance with the ANSI/ASSP A10.48-2023 and ASME B30.30 standards.

Learning Conditions and Considerations

Students shall be provided information on:

a. Wire rope characteristics, including, but not limited to:
    1. Grade
    2. Type
    3. Diameter
    4. Minimum breaking strength (MBS)

b. Selection and compatibility considerations
    1. Determination of WLL incorporating end termination and wrap efficiencies (i.e. D/d ratio)

c. Documentation (e.g. material certification)

d. Wire rope inspection, care, and maintenance criteria

e. Typical end terminations including, but not limited to:
    1. Factory provided terminations.
    2. Wedge sockets
    3. Flemish eyes
    4. Turnback's using wire rope clips
        a) Bolt and saddle types
        b) Fist grip types

5. Swivels (use on non-rotational resistant wire rope)

f. Considerations for use of rope protection including, but not limited to:
    1. Thimbles
    2. Sleeves
    3. Rollers

g. Overhaul weight considerations (i.e. Have sufficient weight to overhaul the weight of the line while accounting for friction and other rigging considerations.)

h. Slippage considerations for wire rope pulling equipment including:
    1. Friction grip cable pullers
    2. Lap splices

Performance Standard

Students shall demonstrate knowledge and practical skills demonstration (see Section 5.3) on the application, design/safety factor, inspection, and maintenance requirements of wire rope used for load, tag, and control lines in accordance with the ANSI/ASSP A10.48-2023 and ASME B30.30 standards.

Part 4: Lifting Arrangements

4.1 LIFTING ARRANGEMENTS/CONFIGURATIONS

Learning Objective

To identify major components and factors which influence rigging forces within a lifting system for straight tag and trolley lifting arrangements/configurations.

Learning Conditions and Considerations

Students shall be provided information on:

a. Lifting arrangements/configurations and systems consistent with the ANSI/ASSP A10.48-2023 consisting of:
    1. Top block with straight tag
    2. Top and heel block with straight tag
    3. Top block with trolley tag (self)
    4. Top and heel block with (dedicated) trolley tag

b. Determination of gross lifted load

c. Load and tag angle considerations based upon:
    1. Load center of gravity
    2. Required load standoff distance(s) throughout the lift with consideration to obstruction clearance at grade and at elevation

d. Lifted load leveling and control (vertical and horizontal stability)

e. Mechanical advantages provided by line parting

f. Factors which influence forces on the primary rigging components including:
    1. Load line forces based upon:
        a) Gross lift weights
        b) Load angle
        c) Tag angle(s)
        d) Parts of line
    2. Tag line forces based upon:
        a) Gross lift weights
        b) Load angle
        c) Tag angle(s)
    3. Hoist pull demands based upon:
        a) Load/tag line forces along with sheave friction factors
    4. Rigging block forces based upon line demands and included angle

5. Sling forces based upon:
    a) Applied load, sling configuration/arrangement, and sling angle(s)
6. Other applicable rigging components

Performance Standard

For the various lifting configurations provided, students shall demonstrate knowledge and practical skills (see Section 5.3) of:

a. Major components of lifting configurations including:
    1. Load line
    2. Tag line
    3. Top block
    4. Heel block
    5. Trolley block
    6. Idler/re-direct blocks
    7. Hoist
b. Factors which influence the applied forces on the following rigging components:
    1. Load line at load
    2. Load line at hoist (line pull)
    3. Tag line
    4. Rigging blocks based upon line pull and angle
    5. Slings based upon block force, arrangement/configuration, and sling angle(s)
    6. Other applicable rigging components
c. Determination of required load standoff distance based upon center of gravity and obstruction clearance.

4.2 LOAD AND PROOF TESTING/LOADING

Learning Objective

To identify the requirements and standard procedures for load and proof testing/loading of equipment and anchorages in accordance with the ANSI/ASSP A10.48-2023.

Learning Conditions and Considerations

Students shall be provided:

a. Load and proof testing/loading procedures in accordance with the ANSI/ASSP A10.48-2023.

b. Requirements for equipment anchorage determination and validation in accordance with the ANSI/ASSP A10.48-2023.

Performance Standard

Students shall demonstrate knowledge (see Section 5.3) of standard procedures for load and proof testing/loading of equipment and anchorages in accordance with the ANSI/ASSP A10.48-2023.

4.3 COMMUNICATIONS

Learning Objective

To identify the requirements and standard procedures for communications in accordance with ANSI/ASSP A10.48-2023.

Learning Conditions and Considerations

Students shall be provided:

a. Communications requirements in accordance with ANSI/ASSP A10.48-2023 and employer policies and procedures

b. Standard hand signal charts in accordance with ANSI/ASSP A10.48-2023, Appendix A-8(b)

Performance Standard

Students shall demonstrate knowledge and practical skills demonstration (see Section 5.3) of requirements and standard procedures for communications in accordance with ANSI/ASSP A10.48-2023.

Part 5: Evaluation

5.1 OBSERVATIONS OF PERFORMANCE

Evaluation Objective

Verify a student's understanding of RTS training topics through evaluation.

Evaluation Conditions and Considerations

Evaluation conditions and considerations shall include:

a. Before issuing a certificate of course completion, a competent and/or qualified person designated by the employer shall evaluate each employee/student.

b. Demonstration of competency from each RTS training topic.

c. A documented written exam covering all RTS training topics (see sample evaluation form provided in 5.2).

d. A documented practical skills demonstration covering section 3 and 4 for a provided construction plan with known line force demands including (see sample evaluation form provided in 5.3):

   1. Determination of the required rigging component working load limits
   2. Selection of compliant and compatible rigging components
   3. Performance of pre-use inspection of rigging components
   4. Assembly of rigging components according to the construction plan
   5. Performance of operations and proof test/loading

5.2 WRITTEN EVALUATION RECORD

The following form is an example for documenting the written evaluation of a student's performance (see Section 5.1). The employer may need to expand on this form to ensure that all performance standards from each RTS training topic and any additional training requirements are observed and sufficiently documented for the specific equipment and operating procedures for services provided by the employer.

Training Provider: _____

Student Name: _____

Evaluator: _____

Evaluation Date: _____

	Pass/Fail	Notes
Part 1: General Training		
1.1 Introduction		
1.2 Policies, Standards, and Regulations		
1.3 Communication Structures		
Part 2: Construction Plan Classifications		
2.1 Identification		
2.2 Stakeholders		
2.3 Operational and Non-Operational Construction Loads		
Part 3: Equipment - Selection, Use and Maintenance		
3.1 Rigging Hardware		
3.2 Synthetic Rope		
3.3 Wire Rope		
Part 4: Lifting Considerations		
4.1 Lifting Configurations		
4.2 Load & Proof Testing		
Overall Result (Pass/Fail):		

Student Signature:_____

Evaluator Signature:_____

5.3 PRACTICAL SKILLS DEMONSTRATION EVALUATION RECORD

The following form is an example for documenting the practical skills demonstration evaluation of a student's performance (see Section 5.1). The employer may need to expand on this form to ensure that all performance standards from each RTS training topic and any additional training requirements are observed and sufficiently documented for the specific equipment and operating procedures for services provided by the employer.

Training Provider: _____

Student Name: _____

Evaluator: _____

Evaluation Date: _____

	Pass/Fail	Notes
Part 3: Equipment – Selection, Use and Maintenance		
3.1 Rigging Hardware		
3.2 Synthetic Rope		
3.3 Wire Rope		
Part 4: Lifting Considerations		
4.1 Lifting Configurations		
4.2 Load & Proof Testing		
Overall Result (Pass/Fail):		

Student Signature:_____

Evaluator Signature:_____

Notes

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