EUROPEAN ASSOCIATION OF ABNORMAL ROAD TRANSPORT AND MOBILE CRANES

SINCE 1976

ESTA

Gearboxes used on Mobile Crane Winches

Inspections

ESTA Guidance Document

ESTA Winch Inspection Guidance - Overview

- Starting point of project
- Proposal developed to eliminate the 10-year major inspection/ overhaul by a „3-legged-stool“ based upon regular inspections
- Approach taken to involve experience from all stakeholders
- *Result:* Guidance document with consent of crane and gearbox manufacturers and laboratories
- Key learnings

ESTA Winch Inspection Guidance – Starting Point 1/2

Issues

- Existing national regulations
- Major inspection/overhaul after 10 year
- Missing information for checks/inspections and acceptance criteria

Request brought to ESTA‘s Work Group European Regulations

- Proposal from the Netherlands not supported by FEM
- ESTA picks the topic as a project

ESTA Winch Inspection Guidance – Starting Point 2/2

Objectives

- Proposal developed to eliminate the 10-year major inspection/ overhaul by a „3-legged-stool“ based upon regular inspections

- Clarification of topics and providing guidance on inspections and checks beyond current instruction manuals
- Introduction of oil analysis including meaningful threshold values
- Avoidance of general overhaul(major inspection at fixed (arbitrary) point in time

ESTA Winch Inspection Guidance – ESTA workgroup

Professional background of ESTA workgroup

Hermen Kamp	Gerrit van Hove	Klaus Meissner
20+ years experience with Cranes and Transport (End user)	25+ years experience with cranes and heavy lifting equipment (End user)	30+ years experience with Cranes (Mobile crane manufacturer)
Manager Assets Mammoet Global • Advisor in equipment purchase • Global process owner & key-user maintenance	Technical advisor and workshop supervisor at Sarens NV	Retired, consulting the crane and lifting industry on technical matters and technical compliance
Expert member (NEN) CEN 147 WG11 EN13000		Chairman CEN 147 WG11 EN13000
Expert member (NEN) ISO TC/96 WG3 Telematics	Qualified person to test winches (Haus der Technik)	Lecturer “Heavy Equipment” at University Kaiserslautern
Supporting ESTA in workgroups	Supporting ESTA in workgroups	• Crane expert for ESTA • President of the Supervisory Board of ECTOL

ESTA Winch Inspection Guidance – Approach 1/2

Proposal developed to eliminate the 10-year overhaul "by a 3-legged-stool", introduce:

- Determination of used amount of design life and residual service life
- Regular Inspections and check (visual and functional)
- Oil sampling and analysis

ESTA Winch Inspection Guidance – Approach 2/2

- ESTA preparing draft document, contacting FEM and contacting gearbox manufacturers (Liebherr, Rexroth, Siebenhaar, Zollern) in virtual meetings
- Sharing improved draft with OEMs (via FEM[1]) to Liebherr, Manitowoc and Tadano) and gearbox manufacturers
- Visiting the 4 gearbox mftc., including discussing the analysis of 3600+ results of oil samples
- Involving 3 laboratories (OelCheck, Polaris, TotalEnergiesAnac)
- Resolving comments in 4 virtual meetings involving manufactures and involving all parties contacted

[1]) FEM, the European association of lifting equipment manufacturers

ESTA Winch Inspection Guidance – Result

Guidance document with consent of crane and gearbox manufacturers and laboratories, containing:

- Description of current situation
- Information, description and spreadsheet tool for determination of used amount of design life and residual service life
- Information on content and acceptance criteria for inspections and checks
- Information about oil sampling and thresholds for acceptance criteria of oil analysis

ESTA Winch Inspection Guidance – Key Learnings

- Regular oil sampling & oil care is not a standard in our industry
- Clean master-data required, what is the base line for oil analysis
- Required cleanliness during sampling, sampling always in same way

- Problem sample port → design gearbox → design crane
- Problem breather → design gearbox

- Instruction manuals require more meaningful information

- Gearbox manufacturers are eager to learn more about the use of their products, requires more exchange of information between all parties involved

For more information about ESTA go to

www.estaeurope.eu

For more information about the European Crane Operator Licence go to

www.ecol-esta.eu

12HOIST4U
Hoisting & Lifting
Recruitment services

Lifting and hoisting: A different approach to safety

CE marking issues with foreign suppliers

Contents of the presentation

- Several questions to start with
- The 4 most important topics related to safety
- Focus on lifting equipment
- Shared responsibility: manufacturer vs. user
- Responsibility of the manufacturer
- The CE mark
- Several examples
- Insight in several incidents
- Answers on the questions at the start
- Advice and summary

Several questions to start with:

- Is it allowed to:
- Use a chain block for X-hauling?
- Use a chain lever hoist for X-hauling?
- Use a beam clamp under an angle?
- Use a wire rope puller for hoisting operations?
- Use attachments on a forklift for hoisting operations?
- Use an excavator for hoisting operations?
- Use a crane for hoisting personnel e.g. with a man basket?
- Stamp your own unique item number on a shackle?

Most important safety topics

The 4 most important topics related to safety when dealing with lifting and hoisting are:

- Rules, regulations and company procedures
- The equipment to be used
- The personnel involved
- External and surrounding factors

This presentation will focus on the equipment

Lifting equipment

- Are subject to many rules and regulations
- Strict compliance with it prevents accidents
- Shared responsibility:
  - ✓ manufacturer on the one hand, versus
  - ✓ the employer/user on the other hand
- Manufacturer must comply with the European Machinery Directive 2006/42/EC
- User must comply with the use of Work Equipment Directive 2009/104/EC

Some remarks on the Machinery Directive

- The directive applies to machinery as well as interchangeable equipment, safety components, lifting accessories, chains/ropes/webbing, removable mechanical transmission devices and partly completed machinery
- Also applicable in Iceland, Liechtenstein and Norway (EFTA countries);
  Switzerland by virtue of the Mutual Recognition Agreement (MRA)
  Turkey, Andorra and San Marino by virtue of the Customs Union Agreements
- The Machinery Directive 2006/42/EC has been repealed by Regulation (EU) 2023/1230 on machinery. This Regulation applies from 20 January 2027 – this will have no impact on this presentation

Objective of the Machinery Directive

- Free market circulation
- The protection of workers and consumers using such machinery
- It defines essential health and safety requirements of general application
- Ensuring that only safe machines are manufactured and sold
- The manufacturer or his authorized representative is responsible and shall take the following steps:
  1. Perform a risk assessment
  2. Prepare a Technical Construction File
  3. Draft and finalise a users' manual
  4. Compose a Declaration of Conformity and affix CE marking

Technical construction file

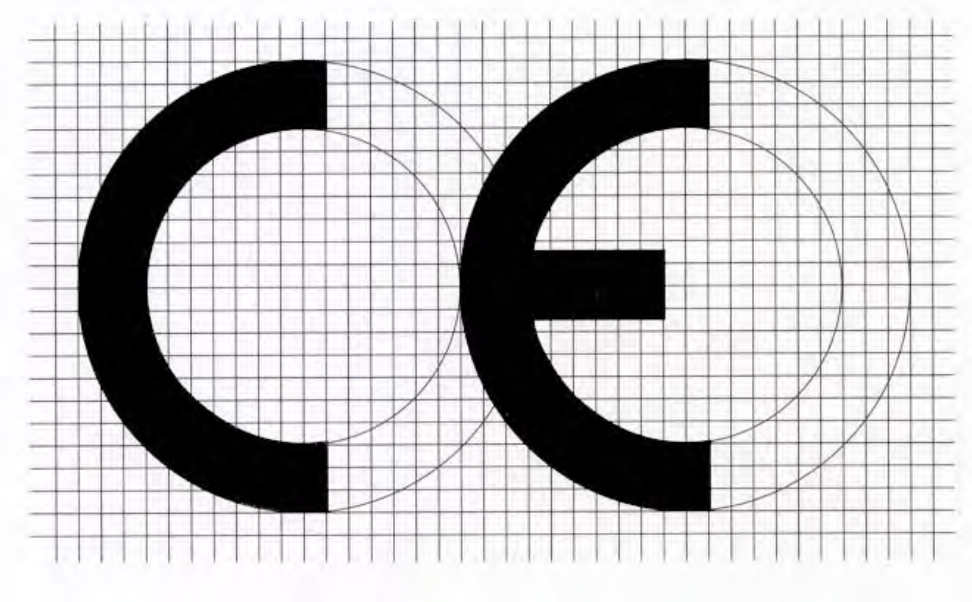
- ✓ Outlined plan of the machine
- ✓ Detailed drawings
- ✓ Calculations
- ✓ Test results
- ✓ List of basic requirements
- ✓ Description of preventive measurements
- ✓ Reports of tests by external bodies
- ✓ Users' manual in the correct language!

User Manual

- ✓ In the language of the country in which the machine is being put on the market
- ✓ Factory and manufacturing data
- ✓ Directions for safe use
- ✓ Intended conditions of use
- ✓ But also: discouraged way of using the equipment
- ✓ Position to be taken by the operator(s)
- ✓ Instructions for:
  - ➢ Commissioning and normal use
  - ➢ Handling the machine
  - ➢ Installing, assemble and disassemble
  - ➢ Adjustment, maintenance and repair

Declaration of conformity

- Prepare EC declaration of conformity
- Affix CE label on the machine



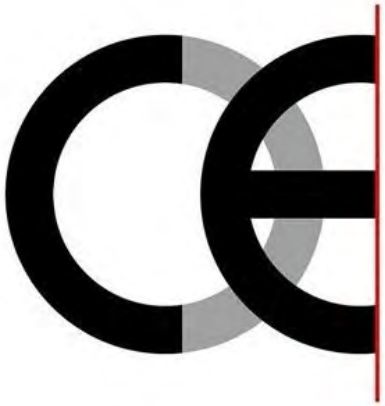
- Manufacturer 10 years responsible
- Construction file 10 years available with manufacturer.

What does CE mean?

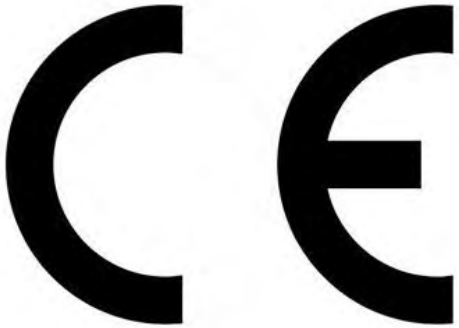
- CE stands for ‘Conformité Européene’
- Which is French for ‘European Conformity’
- The logo indicates that the product complies with all EU standards relevant to the construction of that item
- Which is something completely different than:

China Export

Conformité Européenne



China Export



S ts


CHAIN BLOCK
1000 kg
Lifting Height: 16 M
Building Year: 2023.07
Serial No. 23714017


UP
DOWN
LEVER HOIST
MODEL: VA-A
LOAD CAPACITY: 1½ TON
LENGHT: FT
S/NO:
MADE IN CHINA

When asking for compliance

- Well over a dozen manufacturers have been asked for:
  - ✓ Declaration of Conformity
  - ✓ Users' instructions
  - ✓ And to make "life easy for them" mentioned to accept it in English
- Not one came up with a Declaration of Conformity
- All received users' instructions are extremely poor
- All of them try to convince you with an EC certificate

What you receive

Certificate – Сертификат – 證明書 – Certificat – 증명서 – شهادة

Form QAT_10-M05, version 00, effective since March 25th, 2020

Certificate of Compliance

No. 0B220325.WVIUD11

Certificate's Holder:	Wuhan Vohoboo Import & Export Trade Co., Ltd. No.158 Xudong Street, Wuhan City, Hubei Province, China
Certification ECM Mark:	Type Approved
Product:	Hoist
Model(s):	*(see the following annex)*
Verification to:	Standard: EN ISO 12100:2010, EN 14492-2:2019, EN 60204-1:2018, EN IEC 61000-6-2:2019, EN IEC 61000-6-4:2019, EN IEC 61000-3-2:2019+A1:2021, EN 61000-3-3:2013+A1:2019+A2:2021 related to CE Directive(s): 2006/42/EC (Machinery) 2014/35/EU (Low Voltage) 2014/30/EU (Electromagnetic Compatibility)

Remark: This document has been issued on a voluntary basis and upon request of the manufacturer. It is our opinion that the technical documentation received from the manufacturer is satisfactory for the requirements of the ECM Certification Mark. The conformity mark above can be affixed on the products accordingly to the ECM regulation about its release and its use.

Additional information and clarification about the Marking:

CE The manufacturer is responsible for the CE Marking process, and if necessary, must refer to a Notified Body. This document has been issued on the basis of the regulation on ECM Voluntary Mark for the certification of products. RG01_ECM rev.3 available at: www.entecerma.it

Issuance date: 25 March 2022

Expiry date: 24 March 2027

Reviewer
Technical expert
Amanda Payne

Approver
ECM Service Director
Luca Bedonni

Ente Certificazione Macchine Srl
Via Ca' Bella, 243 – Loc. Castello di Serravalle – 40053 Valsamoggia (BO) - ITALY
☎ +39 051 6705141 🖷 +39 051 6705156 ✉ info@entecerma.it 🌐 www.entecerma.it

UDEM

MACHINERY DIRECTIVE ATTESTATION OF CONFORMITY

Technical file of the company mentioned below has been inspected and audit has been completed successfully.

2006/42/EC Machinery Directive Annex VIII has been taken as references for these processes.

Company Name	: Nc
Company Address	: 99 njing, China
Related Directives and Annex	: 2006/42/EC Machinery Directive/Annex VIII
Related Standards	: EN 60204-1:20 ISO 12100:2010
Product Name	: Ma
Report No and Date	: TCF-
Product Brand/Model/Type	: CG/B50, CG/B75, CG/B100, CG/B150, CG/B200, CG/B300, CG/B350, CG/B400
Certificate Number	: M.2
Initial Assessment Date	: 21.12.2022
Registration Date	: 22.12.2022
Reissue Date/No	: -
Expiry Date	: 21.12.2027

UDEM International Certification Auditing Training Centre Industry and Trade Inc. Co.

The validity of the certificate can be checked through www.udem.com.tr. Upon completion of EC declaration of conformity,it is used solely at the manufacturer's responsibility. This certificate remains the property of UDEM International Certification Auditing Training Centre Industry and Trade Inc. Co. to whom it must be returned upon request. The above named firm must keep a copy of this certificate for 15 years from the registration of certificate. This certificate only covers the product(s) stated above and UDEM must be noticed in case of any changes on the product(s)

Address: Mutlukent Mahallesi 2073 Sokak (Eski 93 Sokak) No:10 Çankaya – Ankara – TURKEY
Phone: +90 0312 443 03 90 **Fax:** +90 0312 443 03 76
E-mail: info@udem.com.tr www.udem.com.tr

UDEM

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What you receive

CERTIFICATE

TÜVRheinland

of Conformity
EC Council Directive 2006/42/EC
Machinery

Registration No.: AM 50374842 0001

Report No.: 50076244 001

Holder: Hebei Shenli Rigging Co., Ltd
Donglv Town, Qingyuan County
Baoding City, Hebei Province
P. R. China

Product: Schäkel
(Forged Alloy Steel Shackle)

Identification:

Type Designation :	SL-BW2	SL-BW3.25	SL-BW4.75
	SL-BW6.5	SL-BW8.5	SL-BW9.5
	SL-BW12	SL-BW13.5	SL-BW17
	SL-BX4.75	SL-BX6.5	SL-BX8.5
	SL-BX9.5	SL-BX12	

Serial No. : Engineering Samples
Remark : Refer to test report 50076244 001 for details.

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. This is to certify that the tested sample is in conformity with all provision of Annex I of Council Directive 2006/42/EC, referred to as the Machinery Directive. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to Annex II of the Directive.

Date 30.01.2019

Certification Body

Xu Feng

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

CE The CE marking may be used if all relevant and effective EC Directives are complied with. CE

CERTIFICATE

TÜVRheinland

of Conformity
EC Council Directive 2006/42/EC
Machinery

Registration No.: AM 50275027 0001

Report No.: 17705595 001

Holder: Qingdao X&H Webbing Co., Ltd.
Webbing Industrial Park
No. 96 Yanqing Road, Jimo
Qingdao City
Shandong Province 266200
P.R. China

Product: Lifting Strap
(Flat Woven Webbing Sling)

Identification: Type Designation: 1" 2" 3" 4" 5" 6" 8" 10" 12"
Serial No. : n/a
Remark: Issued in conjunction with TÜV Rheinland license S 50275022 0001.

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. This is to certify that the tested sample is in conformity with all provision of Annex I of Council Directive 2006/42/EC, referred to as the Machinery Directive. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to Annex II of the Directive.

Date 19.02.2014

Certification Body

Dipl.-Ing. (TU) G. Reimann

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

CE The CE marking may be used if all relevant and effective EC Directives are complied with. CE

And then a close look

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. This is to certify that the tested sample is in conformity with all provision of Annex I of Council Directive 2006/42/EC, referred to as the Machinery Directive. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to Annex II of the Directive.

Additional information and clarification about the Marking:

CE

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Issuance date: 25 March 2022

Expiry date: 24 March 2027

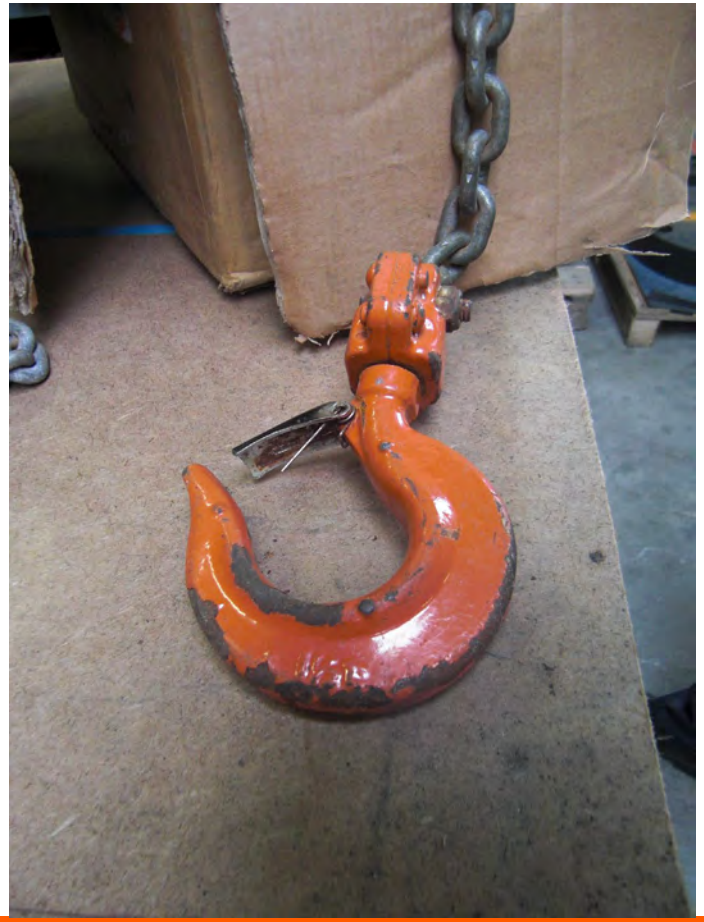
What if the correct CE mark is used?

- Can you simply rely on that?
- Does that assure you of compliance with the Machinery Directive?
- Would it be easy to verify the compliance?
- What can you do?
- How to do it?
- An example:

The following lever hoist

- Supplied by a Dutch trading company
- With Dutch “user manual”
- Bearing the correct CE mark

After two weeks in service: what do you think of this?



Additional information

- The company that used the equipment changed from renting all equipment to owning it themselves
- The equipment changed and
- Personnel using it stayed the same personnel

- Any new ideas coming up now about what caused the incidents?

Investigation showed the following

- Very in-depth investigation of the steel proved it to be of inferior quality
- Request to get a view of the construction file was not accepted
- When confronted with the investigation report the following appeared:
- All lever hoists were fabricated in China
- Trading company did not have a construction file and
- Never checked any construction file of the Chinese manufacturer
- User instructions did not meet the requirements as prescribed in the Machinery Directive
- Same was applicable for chain hoists, beam clamps, trolleys, tirfors
- User instructions ánd Declaration of Conformity in 4 languages on one A4 page!!

So back to the questions:

- Is it allowed to:
- Use a chain block for X-hauling?
- Use a chain lever hoist for X-hauling?
- Use a beam clamp under an angle?
- Use a wire rope puller for hoisting operations?
- Use attachments on a forklift for hoisting operations?
- Use an excavator for hoisting operations?
- Use a crane for hoisting personnel e.g. with a man basket?
- Stamp your own unique item number on a shackle?

Answer

- ✓ On all questions, the answer is:
  show me the users' instructions and I will tell you

Advice and summary

- ✓ Whenever buying lifting equipment:
- ✓ On delivery and before acceptance, check presence, accuracy and completeness of :
  - ➢ EC Declaration of Conformity (manufacturers statement)
  - ➢ the CE marking
  - ➢ **User's manual in the correct language!**
- ✓ **Once in use: make sure all equipment is being used as per the users' instructions!**

EUROPEAN ASSOCIATION OF ABNORMAL ROAD TRANSPORT AND MOBILE CRANES

SINCE 1976

ESTA

Lifting Operation Risk Management Guide

Working group:

- Ton Klijn
- Joe Collins (Becht)
- Norbert van Schaik (Siemens Gamesa)
- Marcel Schets (Mammoet)
- Blanca Claeyssens (ASA France)

Lifting Operation Risk Management Guide

Purpose:

- Clarification of responsibilities and necessary information (client/contract)
- Options for covering risks
- Reference on best practices without repeating existing documents

Lifting Operation Risk Management Guide

Contents:

Lifting Operation Risk Management Guide

Some highlights:

- 0. Terminology

Term/abbreviation	Definition/Explanation
Appointed person	A competent person who has overall control of preparation and execution of crane activity(s) (see: "Person in Charge)
BPG	Best Practice Guide
Client	Any company or person who has a certain load and requests an operating company to lift a load from any point A to any point B.
COG	Centre of Gravity
Competent person	Person who has the necessary practical and theoretical knowledge of- and the necessary experience with the crane and equipment used in the lifting operation

Lifting Operation Risk Management Guide

Some highlights:

- 1. Responsibility triangle

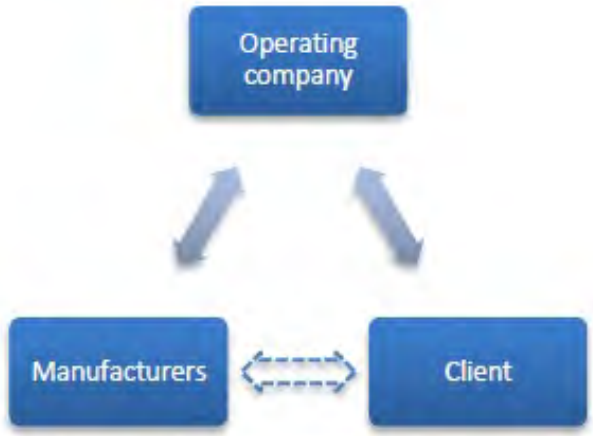


Figure 1: Responsibility triangle

Lifting Operation Risk Management Guide

Some highlights:

- 2. The equipment
  - Types
  - Inspection and maintenance
  - Documentation that should be provided with the equipment

Lifting Operation Risk Management Guide

Some highlights:

- 3. The load
  - Regulations
  - How it should be presented
  - Documentation and information
  - Design features

Lifting Operation Risk Management Guide

Some highlights:

- 4. Professional competence
  - Roles in a team
  - Training framework for
    - person in charge
    - lift supervisors
    - lift engineers
    - operators
    - signallers
    - riggers

The applicable standard for the ECOL crane operator training can be found at:
www./ecol-esta.eu

The validity of any ECOL crane operator licence can be checked at:
https://ecol-esta.eu/ecol-register/credential-checker/

Lifting Operation Risk Management Guide

Some highlights:

- 5. Engineering a lift
  - When do we need engineering?
  - Lift classifications
    - Standard
    - Complex
    - Critical
  - Requirements for engineered lift plans
    - Lifting arrangement
    - Rigging arrangement
    - (dis)assembly arrangement
    - Elevation view drawing

Lifting Operation Risk Management Guide

Some highlights:

- 6. On site preparation for a lift
  - Inspection of equipment
  - The work environment
  - Documents and procedures
  - Exceptional circumstances
    - High risk “routine” work (waste containers, gas cylinders,…)
    - Lifting of persons
    - Lifting with 2 cranes
    - Cranes on barges
    - Demolition activities

Lifting Operation Risk Management Guide

Some highlights:

- 7. Execution of the lift
  - Final checks and contingency plan
  - Management of change
  - Lift execution

Lifting Operation Risk Management Guide

Some highlights:

- Annexes
  - Example of responsibility matrix
  - Requirements for lifting gear/accessories
  - Lift data sheet (sort of checklist to prepare the mission)
  - Guidance for risk assessment and method statement
  - Toolbox talk checklist
  - Contingency plan “what if? Checklist
  - Info on lifting of prefab concrete elements and pre-slung loads
  - Wind limitation assessment (how to calculate)

Lifting Operation Risk Management Guide

Now what?


TRUST ME
I'm an Engineer

For more information about ESTA go to

www.estaeurope.eu

For more information about the European Crane Operator Licence go to

www.ecol-esta.eu

ISO TC96 WG3 Telematics

April 2024 – Hermen Kamp

Introduction

- Telematics systems are being designed and installed by manufacturers of cranes to aid customers in their efforts to keep these machines at optimal operation. Therefore, it is important that data is provided in a uniform format as described in this standard.

- Generally, the purpose of data dictionaries is recognized to be the following:
  - to improve the ability to share data elements in a particular domain or among different domains;
  - to provide a base for better understanding of the semantic meaning and syntax of data elements;
  - to manage a data resource so as to maintain the correctness and consistency of the resource;
  - to provide a basis for the development of consistent databases and software that use databases.

Scope of the document

- Document specifies the communication scheme to provide crane status data
- Data management and access control
- Response / message formats of datapoint
- Standardization of datapoints examples:
  - Date and time format
  - What is Idling?
  - What is load?

Examples Crane Carrier

Data point	Location	Result Units of Measure	Comments
single / dual engine crane			
Manufacturer Identification		actual value	
Vehicle Identification Number VIN		actual value	North America/EU/Australia 17 digits. See ISO 3779 for WIN
manufacturer serial number		actual value	Need to consider character field length (maybe match VIN length) LB 20? May need manufacturer identification to avoid duplication
Timestamp		ISO 8601	
Actual Engine Torque at current speed	Carrier engine	% of max torque	SAE J1939 message (IC engines, may need to consider other types of power sources. FMS document references ACEA Task Force)
Engine speed	Carrier engine	RPM	SAE J1939
Throttle position	Carrier engine	% of max	future consideration and discussion needed. Is this needed.
Engine percent load at current speed	Carrier engine	% of max load	SAE J1939 message (IC engines, may need to consider other types of power sources.)
Coolant temperature	Carrier engine	°C	SAE J1939
Intercooler temperature	Carrier engine	°C	SAE J1939
Ambient air temperature	Carrier engine	°C	SAE J1939
Fuel Level	Carrier	% of tank max fill level	SAE J1939
DEF tank 1 level	Carrier	% of tank max fill level	SAE J1939
Engine Fuel Rate	Carrier engine	Liter/hr	SAE J1939
Engine Instantaneous Fuel Economy	Carrier engine	Liter/hr	SAE J1939

Examples Crane Upper structure

Data point	Location	Result Units of Measure	Comments
RCL override	Crane	active / not active	may be optional based on manufacturer. Need input from manufacturer for future consideration.
Deadman / seat switch	Crane	active / not active	
Main hoist 1 active	Crane	0 / up / down / NA	Hoist active = functioning & NA = not installed in machine.
Main hoist 1 parts of line	Crane	actual value	
Main hoist Anti 2 block switch	Crane	active / not active / NA	When hoist becomes a luffing hoist(see line item for luffing hoist). Active - hoist function stops, not active, hoist function is normal.
Main hoist 2	Crane	0 / up / down / NA	Hoist active = functioning & NA = not installed in machine.
Main hoist 2 parts of line	Crane	actual value	
Main hoist 2 Anti 2 block switch	Crane	active / not active	When hoist becomes a luffing hoist(see line item for luffing hoist). Active - hoist function stops, not active, hoist function is normal.
Aux hoist	Crane	0 / up / down / NA	Hoist active = functioning & NA = not installed in machine.
Aux hoist parts of line	Crane	actual value	
Aux hoist Anti 2 block switch	Crane	active / not active	When hoist becomes a luffing hoist(see line item for luffing hoist). Active - hoist function stops, not active, hoist function is normal.
Mainboom luffing winch	Crane	0 / up / down / NA	Boom hoist winch - up = boom up, down = boom down
Jib luffing winch	Crane	0 / up / down / NA	Luffing jib hoist winch - up = boom up, down = boom down
RCL settings Imperial / metric	Crane	metric / imperial	If operator selects imperial, the system will convert to show imperial to operator
RCL code / setting (program)	Crane	actual value	Varies per manufacturer - alphanumeric string that records current operating mode
Actual load (percent load utilization)	Crane	%	Actual load as percent of rated load (capacity utilization)
Actual load	Crane	metric ton	Actual load per RCL

Update

- April 2024: Ad-hoc group working on the scheme almost complete
- Share results with WG Conveynor for distribution
- Review document late summer 2024