	<b><u>DIRECTORATE GENERAL OF SHIPPING,</u></b> <b><u>GOI, MUMBAI</u></b>	IS/ISO Clause No.7.1
Ref.: QMS EACQP-07-1	Subject:- High Voltage Safety and Switch Gear Course at Operational Level	File No. TR/Circ/6(1)/2016
Approved by the  Directorate General of Shipping, GoI	<b>Training Circular No. 03 of 2016</b>	Date: 15.07.2016

1. The Directorate General of Shipping (DGS) had issued STCW 2010 Circular No. 1 of 2011 dated 10.02.2011 which prescribes the Guidelines for conduct of Pre-sea Training and Certification course for Electro Technical Officers on Merchant Ships. This course includes both High Voltage Segments as well as without High Voltage segments.
2. Subsequently, the DGS has granted approvals for the stand-alone High Voltage Safety and Switch Gear Course as a separate modular Course of six days duration applicable to Management Level Engineer Officers & Electro-Technical Officers vide Training Circular No. 1 of 2016 dated 15<sup>th</sup> February 2016.
3. Consequent to the 2010 adoption of amendments to the STCW Code, the DGS had issued Revised Course Curriculum for Four Years Degree Course in Marine Engineering vide STCW Circular No. 04 of 2012 dated 12.01.2012 which comprises the revised competency requirements as per the 2010 amendments of STCW Code.
4. Although, the above stated revised syllabus does not specifically prescribe the training requirement on High-voltage installations, it itemizes four hours class room teaching on High-voltage installations as a part of competency no. 6 under Function: *Electrical, electronic & Control Engineering* at the operational level.
5. The Shipping Industry now has requested DGS to specify the requirement of Training on High Voltage Segments for Operational Level Engineer officers.
6. Realizing the importance of training requirement in enhancement of the competency in High Voltage Safety and Switch Gear for the Operational Level Engineer Officers, the competent authority has advised Maritime Training Institutes (MTIs), approved for conducting the High Voltage Safety and Switch Gear Course, to reschedule their course curriculum in such a way that the training programme covers the competency requirements on High-voltage segments for operational level Engineer Officers on

the first day of the 6 days High Voltage Safety and Switch Gear Course as given in Annex - 1 to Annex 3. This is to facilitate the Operational Level Engineer Officers to complete their High Voltage course on the first day itself and on successful completion of the same; they are to be issued with course Completion Certificate as given in Annex - 4.

For the above purpose, Institutes approved for 6 days High Voltage Safety and Switch Gear Course (capacity of Max 12 candidates) are hereby permitted to induct additional 12 candidates on the first day of the course for operational level training. Course ID: 171 is allotted to this course.

7. All those Operational Level Engineer Officers who have undergone Pre-Sea Training as per the requirements of STCW 95 are required to undergo the above stated one day course on High Voltage Safety and Switch Gear for getting endorsement for high voltage / or deletion of high voltage restriction in their CoC.
8. All those Operational Level Engineer Officers who have undergone Pre-Sea Training as per the revised course curriculum of STCW Circular No. 04 of 2012 dated 12.01.2012, as per STCW 2010, without any training on High-voltage installations are also required to undergo the above stated one day course on High Voltage Safety and Switch Gear for getting endorsement for high voltage / or deletion of high voltage restriction in their CoC.
9. However, the above One day training course in High Voltage Safety and Switch Gear at Operational Level shall not be required for all those candidates who have received this training as part of their pre-sea training under STCW 2010 and have been issued with a separate certificate or is reflected in their course completion certificate.
10. This is issued with the approval of the Competent Authority.

  
(Sanjay Anchalwar)

Deputy Director General of Shipping

**Enclosures:**

- Annex 1: Detailed teaching syllabus & Learning outcomes,
- Annex 2: Course Outline,
- Annex 3: Course Time Table,
- Annex 4: Format of the Certificate & Course contents on the back of the Certificate.

## **ANNEX 1**

IMO Model Course 7.04, Ed. 2014

**Officer in charge of an Engineering Watch**

**Function 2: Electrical, Electronic and Central Engineering at the Operational Level**

**Competence 2.1: Operate Electrical, Electronic and Control Systems.**

**Section 1.7: High Voltage Installation (5 hours)**

- States that more than 1,000 V is usually called high voltage
- States how and why high-voltage installations are used on board ships
- States what voltages are mostly used as high voltage on board ships
- Describes equipment / installations in high-voltage systems such as high-voltage generator, distributor board, motors, etc.
- States the special characteristics and features of high-voltage installations in comparison with less than 1,000V
- States that high voltage systems are normally earthed via a resistor
- Explains how the presence of earth faults is indicated in a high-voltage system with an earthed neutral
- States safety precautions to be strictly observed to prevent accidents when working on high-voltage electrical equipment
- States that any operation of high-voltage installations must be carried out remotely at places where a certain distance is being kept from the installations

### **Learning Outcomes**

- Definition of high voltage and typical voltages found on board ship.
- The learner knows the arrangement and protection of high voltage installations on board a vessel.
- Need for High voltage safety rules and procedures
- Requirement of modern vessels which are equipped with high voltage generators and distribution system.
- Statutory regulations & requirements for high voltage system on marine and offshore applications
- Difference between insulated & earthed neutral distribution system and function of the protection devices and their sequence of operation in a high voltage distribution system.
- Electrical Hazards associated with high voltage systems. E.g. electrical shock, arc flash and arc blast
- Arrangement of high voltage switches room equipment and associated equipment.
- Practices and PPE requirements.
- Competent person and authorized personnel to carry out maintenance and repair and permits.
- Operational and safety features associated with high voltage electrical hazards, including importance of a Circuit Main Earth.

## ANNEX 2

### COURSE OUTLINE

<b>Knowledge, understanding and proficiency</b>	<b>Total hours for lectures</b>	<b>Total hours for practical's</b>
1. Introduction, Safety briefing and objectives of the course.	0.25 hrs.	
2. High Voltage Technology and application on board ships, concepts and definitions	0.75 hrs.	
3. Electrical Hazards associated with high voltage systems and earthing system. e.g. electrical shock, arc flash and arc blast and their precautions.	1.50 hrs.	
4. Arrangement of high voltage installation, switch room, switches boards, transformers and earthing system and remote operation.	1.50 hrs.	
5. Safety Regulations, Permits and procedures for preventing accidents while carrying out maintenance and repair.	1.00 hrs.	
6. Operational and safety features associated with high voltage electrical hazards.	0.75 hrs.	
7. Demonstration of High Voltage Safeties and functionalities of High Voltage Switch Gear.		0.50 hrs
8. Types of PPE requirement for High voltage system and Donning of PPE	0.50 hrs.	
9. Practical Donning and Use of High Voltage PPE		0.75 hrs.
<b>Assessment and Discussions</b>	0.50 hrs	
<b>Subtotals</b>	<b>6.75</b>	<b>1.25</b>
<b>TOTAL HOURS</b>		<b>8.0</b>

## ANNEX 3

### COURSE TIME-TABLE

	1st Period (2.0 Hours) (0900 - 1100hrs)	2nd Period (2.0 Hours) (1115 - 1315hrs)		3rd Period (1.45 Hours) (1345 - 1530hrs)	4th Period (2.15 Hours) (1545 - 1800hrs)
Day 1	<ol style="list-style-type: none"> <li>1. Introduction, Safety briefing and objectives of the course</li>   <li>2. High Voltage Technology and application on board ships, concepts and definitions</li>   <li>3. Electrical Hazards associated with high voltage systems and earthing system. e.g. electrical shock, arc flash and arc blast and their precautions</li> </ol>	<ol style="list-style-type: none"> <li>4. Electrical Hazards associated with high voltage systems and earthing system. e.g. electrical shock, arc flash and arc blast and their precautions (contd...)</li>   <li>5. Arrangement of high voltage installation, switch room, switches boards, transformers and earthing system and remote operation</li> </ol>	Lunch Break (1315- 1345 hrs)	<ol style="list-style-type: none"> <li>6. Safety Regulations, Permits and procedures for preventing accidents while carrying out maintenance and repair.</li>   <li>7. Operational and safety features associated with high voltage electrical hazards.</li> </ol>	<ol style="list-style-type: none"> <li>8. Demonstration of High Voltage Safeties and functionalities of High Voltage Switch Gear.</li>   <li>9. Types of PPE requirement for High voltage system and Donning of PPE</li>   <li>10. Practical Donning and Use of High Voltage PPE</li>   <li>Assessment and Discussions</li> </ol>

**ANNEX 4**



**NAME and ADDRESS of the D. G. Approved Training Institute**

**INDOS No:** \_\_\_\_\_

**Tel:** \_\_\_\_\_

**Fax:** \_\_\_\_\_

**E-mail:** \_\_\_\_\_

**Certificate No:** \_\_\_\_\_

THIS IS TO CERTIFY THAT *[full name of candidate]*

Date of Birth ..... (dd/mm/yyyy)

Holder of C.D.C. No. ....

Certificate of Competency (if any), Grade : ..... No. ....

Indian National Database of Seafarers (INDoS No.) .....

has successfully completed a training course in

**HIGH VOLTAGE SAFETY AND SWITCH GEAR COURSE**

**(OPERATIONAL LEVEL)**

held on .....

This course is approved by the Directorate General of Shipping and meets the requirements laid down in relevant sections of Regulation A-III/1, Section A-III/1, Table A-III/1 and Regulation A-III/7, Section A-III/7, Table A-III/7 of the STCW Convention and Code as amended in 2010.

The candidate has also met the additional criteria in the STCW convention, applicable to the issue of the certificate.

This certificate is issued under the authority of the Directorate General of Shipping, Ministry of Shipping, Government of India.

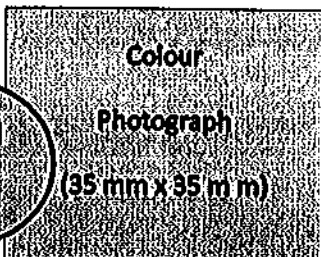
\_\_\_\_\_  
Signature of Candidate

\_\_\_\_\_  
Name and Signature of Course In-charge

Date of Issue : \_\_\_\_\_

Date of Expiry : **UNLIMITED**

\_\_\_\_\_  
Name and Signature of Dean / Principal



*(Details of topics covered are mentioned overleaf)*

**The candidate has received training on the following systems and equipment:**

- High Voltage Technology and its application on board ships
- Electrical hazards associated with High Voltage systems and their precautions
- Arrangement of high voltage installation and earthing system
- Operation and safety features and functionalities of High Voltage Switch Gear
- Permit systems, safety procedures and use Personal Protective device when working with High Voltage systems