



BSI Standards Publication

HVDC installations - Guidelines on asset management

National foreword

This Published Document is the UK implementation of IEC/TR 62978:2017.

The UK participation in its preparation was entrusted to Technical Committee PEL/22/-/2, High Voltage Direct Current (HVDC) transmission for DC voltages above 100 kV.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Published by BSI Standards Limited 2017

ISBN 978 0 580 89483 1

ICS 29.240.01; 03.100.10

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 October 2017.

Amendments/corrigenda issued since publication

Date	Text affected
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TECHNICAL REPORT



HVDC installations – Guidelines on asset management

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.240.01; 03.100.10

ISBN 978-2-8322-4829-4

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CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	9
3 Terms and definitions	9
4 HVDC asset.....	12
4.1 Asset background	12
4.2 Asset facilities.....	13
4.3 Asset components and layout arrangement.....	13
5 Asset management policy and strategy.....	16
5.1 General.....	16
5.2 Common policy and practices	17
5.3 Asset management framework	18
6 Risk management.....	19
6.1 General.....	19
6.2 Risk management requirements	20
6.3 Common policy and practices	21
7 Asset management life cycle activities.....	22
7.1 General.....	22
7.2 Asset management decision process	22
7.3 Life cycle costing	24
7.3.1 General	24
7.3.2 Forecasting O&M costs due to asset failures	24
7.3.3 Forecasting capital replacement costs due to asset failures.....	25
7.4 Spares strategies.....	26
7.5 Life extension strategies	26
7.6 Run to failure strategies	28
7.7 Refurbishment of HVDC system	28
8 Change management.....	28
8.1 General.....	28
8.2 Common policy and practices	29
8.3 Development of resources in HVDC system	29
8.3.1 General	29
8.3.2 Skill retention and development in HVDC system.....	29
8.3.3 Factors in deciding level of HVDC skill retention	29
8.3.4 Skill retention under different organizational relationships	30
8.3.5 Establishing a productive work culture	30
8.3.6 Alliances and partnership	31
8.3.7 Maintaining capabilities over the long term	31
9 HVDC maintenance	31
9.1 General.....	31
9.2 Common policy and practices	33
9.3 Special tools and maintenance equipment	34
9.4 Impact of major spares	35
9.5 Strategic spares.....	35
9.5.1 Philosophy and common practices	35

9.5.2	Sharing of strategic spares between users/utilities.....	37
9.5.3	Storage considerations	38
9.6	Work safety.....	38
9.7	HVDC thyristor valve maintenance – Periodic maintenance	39
9.8	Converter transformer maintenance	39
9.9	Converter transformer replacement.....	40
9.10	Reactor maintenance	40
10	Asset management of co-owned HVDC project.....	41
10.1	General.....	41
10.2	Project planning stage	41
10.3	Project implementation and commissioning	41
10.4	HVDC system maintenance management after commissioning.....	41
10.5	HVDC system operation management.....	41
11	HVDC reliability and availability	42
11.1	General.....	42
11.2	Performance monitoring policy and practices	43
11.3	General requirements on performance monitoring of HVDC system	44
11.4	Availability and reliability measurement.....	44
11.4.1	General	44
11.4.2	Scheduled maintenance outages	45
11.4.3	Outage and curtailment times	45
11.5	Verification of availability and reliability performance	46
11.6	Availability and reliability calculations	46
11.7	Reliability criteria of HVDC control and protection system	46
11.8	Alternative methods in achieving high performance.....	47
12	Documentation and records	48
12.1	General.....	48
12.2	Common policy and practices	48
12.3	Information management	48
12.4	Types of documentation.....	50
12.5	Document identification.....	50
12.6	"As-built" drawings and data	50
12.7	Submittal quantities and schedule.....	51
12.8	Inventory list	51
12.9	System studies, equipment specifications, calculations and drawings	51
12.9.1	General	51
12.9.2	Control system hardware design document.....	52
12.9.3	Digital control system software design document.....	52
12.10	Operation manuals.....	53
12.11	Maintenance manuals	53
13	Training requirements.....	54
13.1	General.....	54
13.2	Common policy and practices	54
13.3	Training for design engineers.....	55
13.4	Training for staff participating in commissioning.....	55
13.5	Training for operators and maintenance staff	55
13.6	Training on communication system	56
13.7	Training support.....	56

13.8	Advance or intensive training at factory.....	56
13.9	Operation and maintenance training.....	56
13.10	Training course content	57
13.11	Training materials	57
Annex A (informative)	Sharing of HVDC strategic spares	58
Annex B (informative)	User survey.....	59
Bibliography.....		60
Figure 1	– Typical bipolar thyristor based HVDC system	16
Figure 2	– Asset management perspective.....	19
Figure 3	– Issues influencing asset management life cycle decisions	23
Figure 4	– Operation and maintenance coordination of co-owned HVDC system	42
Figure A.1	– Typical method of sharing HVDC strategic spares.....	58
Table 1	– Main asset components of an HVDC system	14
Table 2	– Typical risk assessment parameters	21
Table 3	– HVDC equipment lifetime	27
Table 4	– Typical HVDC maintenance activities, intervals and methods	33
Table 5	– Time frame and scale of maintenance activities.....	34
Table 6	– Summary of maintenance methodologies	34
Table 7	– Special tools and maintenance equipment.....	35
Table 8	– Control and protection spares.....	37
Table 9	– Communication, control and protection miscellaneous spares	37
Table 10	– Storage of HVDC spare equipment.....	38
Table 11	– Equipment failures that caused unplanned outage time	43

INTERNATIONAL ELECTROTECHNICAL COMMISSION

HVDC INSTALLATIONS – GUIDELINES ON ASSET MANAGEMENT**FOREWORD**

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IEC TR 62978, which is a technical report, has been prepared by IEC technical committee 115: High Voltage Direct Current (HVDC) transmission for DC voltages above 100 kV.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
115/148/DTR	115/159/RVDTR

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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INTRODUCTION

Asset management is defined as the act of structured and coordinated efforts by an organization to optimally manage its assets and their associated performance, risks and expenditures over their life cycle.

The management of physical assets (their selection, maintenance, inspection and renewal) plays a key role in determining the operational performance and profitability of industries that operate their assets as part of their core business.

In general, High Voltage Direct Current (HVDC) systems have specific requirements that need to be addressed separately as compared to conventional High Voltage Alternating Current (HVAC) power transmission due to underlying differences in technology.

HVDC systems are a well proven technology employed for bulk power transmission all over the world, mainly because of its superior controllability of transmitted power. It can be utilized for various applications such as stabilization of the connected Alternating Current (AC) network, dynamic control of frequency and modulation of active and reactive powers. In addition, HVDC is more economical for long distance transmission of bulk power and applicable for interconnecting asynchronous AC networks.

An international standard defining key elements of asset management framework for HVDC installations is therefore crucial to provide ample foundation for best practices to be implemented to achieve high efficiency, availability and reliable long-term operation.

At present the activities with respect to asset management are standardized as International Standard in the ISO 55000 series. The general principles are given in ISO 55000 with further details in ISO 55001:2014, Asset management – Management systems – Requirements and ISO 55002:2014, Asset management – Management systems – Guidelines for the application of ISO 55001. These standards are developed from the British Standard Institute (PAS-55:2008), which recommends a general asset management framework for physical assets. The PAS 55-1:2008 document was referred to in the initial development of this technical report.

In the absence of a credible standard reference on asset management of HVDC, utilities all over the world presently practice HVDC asset management based on their own interpretation and experience gathered through the years, which may not be in line with the best and prudent practices. This IEC Technical Report on the guidelines of asset management for HVDC installations is the first step, moving forward, in providing a standard framework and reference point for operators and owners of an HVDC installation based on best industry practices.

HVDC INSTALLATIONS – GUIDELINES ON ASSET MANAGEMENT

1 Scope

This document gives guidelines on the current asset management perspectives for HVDC installations based on best practices of asset owners, operators, users, original equipment manufacturers and regulators within the power industry.

Asset management is a set of systematic and coordinated activities and practices through which an organization optimally and sustainably manages its asset and asset systems, their associated performance, risks and expenditures over their life cycles for the purpose of achieving its organizational strategic plan.

An asset management system is the embodiment of the asset life cycle starting from asset planning, creation, utilization, operation, maintenance, and to the extent of, the retirement and disposal of the asset. It consists of the organization's asset management policy, asset management strategy, asset management objectives, asset management plans and the activities, processes and organizational structures necessary for their development, implementation and continual improvement.

The scope is limited to the DC plant/equipment side of the HVDC system including related AC components of the HVDC converter station. This document covers all equipment of HVDC converter station and electrode station but does not include DC lines and cables.

This document covers HVDC systems with Line-Commutated Converters (LCC) and can be generally applied to Voltage Sourced Converters (VSC), not including specific equipment or sub-equipment required under VSC.

This document on asset management covers:

- a) policy and strategy;
- b) training;
- c) information management;
- d) change management;
- e) life-cycle costing;
- f) tools;
- g) performance monitoring and measurement;
- h) documentation, operation and maintenance; and
- i) risk management.

This document provides base guidelines on fundamental aspects and prudent practices to be considered by stake holders in managing HVDC assets. Compliance to additional requirements and recommendations stipulated in this document by the supplier or OEM are non-obligatory, unless explicitly specified by the customer.

The guideline was prepared based on the following references to establish best practices:

- published documents from other related organizations e.g. CIGRE;
- an international survey on current practices of HVDC installations conducted by IEC TC 115 (see Annex B);
- regional and international forum on management of HVDC assets;