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BSI Standards Publication

HVDC installations - Guidelines on asset management

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National foreword

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

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

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HVDC installations – Guidelines on asset management

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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- withdrawn,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;